

# Core Learning Exchange CTE Catalog – November 2024 V1

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## Courses By Cluster, Publisher with Learning Objectives

### Agriculture, Food & Natural Resources

#### Certify ED

##### Agricultural Science (Video & VR)

##### *Unit: Agricultural Science - The Foundations of Agriculture: Human Needs, Industry Branches, and Economic Impact*

##### Learning Objectives:

- - Explain the three basic human needs and sources for food, clothing, and shelter.
- - Define agriculture.
- - Identify major agricultural milestones or inventions and analyzes their impact on modern life and agriculture.
- - Describe the eight major branches of the agriculture industry.
- - Differentiate between agricultural imports and exports and list examples of each.
- - Identify the agricultural commodities within each region of the United States and the world.
- - Explain the role of the different types of agribusiness in society and identify agribusinesses in the local community.
- - Define agribusiness terminology and discuss the role of marketing in agricultural production.
- - Explain how agribusiness financial records (i.e balance sheets, budgets, cash-flow statements, income statements, and profit and loss statements) are used.
- - Analyze the skills, education requirements, income, and advantages and disadvantages of careers in the agriculture industry.

##### *Unit: Agricultural Science - Navigating the Future of AFNR: Trends, Challenges, and Opportunities*

##### Learning Objectives:

- - Evaluate and explain emerging trends and the opportunities they may create within the agriculture, food, and natural resources (AFNR) systems.
- - Assess the economic impact of an AFNR system on a local, state, national, and global level.

- - Examine historical and current data to identify issues impacting Agriculture, Food and Natural Resources (AFNR) systems.
- - Examine the role of the agricultural industry in the interaction of population, food, energy, and the environment.
- - Examine how current and past agricultural policies shape the industry.
- - Discuss the importance of safety in agricultural occupations.

#### ***Unit: Agricultural Science - Agricultural Safety: A Comprehensive Guide***

##### Learning Objectives:

- - Identify hazards in agricultural education labs and work sites.
- - Identify the common causes and prevention of accidents in agriscience operations.
- - Identify proper disposal of hazardous waste materials and biohazards.
- - Describe emergency procedures for basic first aid, CPR, chemical spills, and fire extinguisher use.
- - Identify safety equipment and procedures for various agriculture related activities.
- - Describe how to follow the safety procedures and appropriate behavior while working in the agriculture classroom, labs, and/or work sites.
- - Evaluate the food safety responsibilities that occur along the food supply chain.

#### ***Unit: Agricultural Science - Soil Science and Land Management***

##### Learning Objectives:

- - Describe soil formation and soil composition.
- - Differentiate between soil components.
- - Explain the importance of soil ecosystems.
- - Analyze the importance of slope, soil texture, erosion, and water movement in determining land capability and land use.
- - Determine land class on a given site and select appropriate soil management practices.
- - Describe preparations of land for efficient cropping.
- - Identify the different kinds of soil tests used to evaluate its physical appearance, composition, pH, and moisture level.
- - Identify the different kinds of chemical soil tests and soil amendments.
- - Analyze the skills, education requirements, income, and advantages and disadvantages of careers in agronomy.

#### ***Unit: Agricultural Science - Unit Sim***

##### Learning Objectives:

- - Understand farm vehicle maintenance
- - Understand crop leaf identification
- - Understand administering a livestock injection

### ***Unit: Agricultural Science - Plant Growth and Development: A Comprehensive Guide***

#### Learning Objectives:

- - Describe the basic factors in plant growth.
- - Identify plant life cycles and list examples.
- - Label the major parts of the plant and explain the functions of each plant part.
- - Compare and contrast photosynthesis, respiration, and transpiration and state their importance.
- - Identify important floriculture and nursery/landscape plants.
- - Explain the roles of essential plant nutrients for plant growth and reproduction.
- - Explain the use of organic and inorganic fertilizers in plant production.
- - Explain the basic principles of irrigation in plant production.

### ***Unit: Agricultural Science - Plant Biology: From Propagation to Pest Control***

#### Learning Objectives:

- - Demonstrate sexual and asexual methods of various plant propagation techniques.
- - Sequence the steps of pollination and fertilization.
- - Demonstrate scarification, stratification, and planting seeds.
- - Investigate the nature and properties of food, fiber, and by-products from plants.
- - Outline the germination steps and list the conditions under which germination occurs.
- - Investigate the impacts of various pests and propose solutions for their control.
- - Identify and classify plant diseases.
- - Explain the proper storage of pesticides.
- - Analyze the skills, education requirements, income, and advantages and disadvantages of careers in the plant science industry.

### ***Unit: Agricultural Science - Forestry, Natural Resources, and Livestock: A Foundation for Agriculture***

#### Learning Objectives:

- - Describe the importance of the forestry and natural resource industry.
- - Label various parts of trees and explain their functions.
- - Demonstrate the ability to measure forest products and forest-related items.
- - Identify basic equipment used in forestry.
- - Identify important species of trees.
- - Identify important species of wildlife in regards to agriculture.
- - Explain the relationship between wildlife and the environment.
- - Compare and contrast approved practices in managing wildlife.
- - Analyze the skills, education requirements, income, and advantages and disadvantages of careers in the forest and natural resources industry.

- - Analyze the role, importance, and scope of the dairy and beef industries in modern agriculture.
- - Identify and describe the major breeds within each livestock segment of the dairy and beef industry.

#### ***Unit: Agricultural Science - Livestock Production: A Comprehensive Overview***

##### Learning Objectives:

- - Analyze the role, importance, and scope of the pork industry in modern agriculture.
- - Identify and describe major breeds within each livestock segment of the pork industry.
- - Analyze the role, importance, and scope of the equine industry in modern agriculture.
- - Identify and describe the major breeds within each livestock segment in the equine industry.
- - Analyze the role, importance, and scope of the small ruminant animal industry in modern agriculture.
- - Identify and describe major breeds within each livestock segment in the small ruminant animal industry.
- - Explore the importance of alternative livestock in animal agriculture.
- - Define key terminology related to animal science and production practices.
- - Distinguish between animal welfare and animal rights.
- - Explain the basic anatomy and label basic external parts of production animals.
- - Differentiate between major wholesale/retail meat cuts of beef, pork, lamb, and poultry and compare the value of various meat cuts.
- - Provide for the care and welfare of animals.
- - Analyze the skills, education requirements, income, and advantages and disadvantages of careers in the animal industry.

#### ***Unit: Agricultural Science - Food Science and Technology: Principles and Applications***

##### Learning Objectives:

- - Identify the government requirements and government agencies associated with food quality and food safety.
- - Explain the importance of developing and maintaining sanitation standards.
- - Explain the importance of food processing, preserving, and packaging.
- - Explain the various types of processing, preserving, and packaging of foods using various methods and techniques.
- - Analyze the skills, education requirements, income, and advantages and disadvantages of careers in the food processing industry.
- - Explain the physics concepts of work, power, simple machines, and mechanical advantage as they relate to agriscience.

- - Analyze the use of thermal energy, electrical energy, and compression in agriculture and describe the basic principles of each.

#### ***Unit: Agricultural Science - Agricultural Technology and Sustainability***

##### Learning Objectives:

- - Trace the development of agricultural machinery.
- - Select and demonstrate proper use of hand tools in agriculture.
- - Describe how to perform basic service and maintenance recommendations on a tractor or lawn mower.
- - Analyze the skills, education requirements, income, and advantages and disadvantages of careers in the agricultural mechanics industry.
- - Identify the agricultural commodities that can be converted into energy sources.
- - Analyze the efficiency of renewable energy sources such as wind, solar, and biofuels.
- - Explain current production practices such as organic, naturally raised systems, and conventional agricultural production with regard to their sustainability.
- - Explain how intensive production systems such as aquaculture and vertical farming can maximize production while minimizing space requirements.
- - Analyze the skills, education requirements, income, and advantages and disadvantages of careers in the agricultural environmental science industry.

#### ***Animal Science (Video & VR)***

#### ***Unit: Animal Science - Animal Science: A Foundation for Understanding and Addressing Contemporary Issues***

##### Learning Objectives:

- - Describe animal science and the roles of animals in society.
- - Analyze the perceptions of public opinion on animal-related issues.
- - Interpret the reasons given by some people for their objections to raising farm animals.
- - Investigate the benefits to livestock producers to have healthy animals.
- - Explain potential problems of animal production such as the continuous use of antibiotics.
- - Describe the predominant sectors of the animal science industry.
- - Outline the development of the animal industry and the resulting products, services, and careers.
- - Explain trends and implications of future development of the animal systems industry.

#### ***Unit: Animal Science - Understanding Animals: Taxonomy, Economics, Careers, and Safety***

##### Learning Objectives:

- - Analyze the visual characteristics of an animal; select taxonomical classification terminology.
- - Analyze the visual characteristics of an animal product; select taxonomical classification terminology when referring to production animals.
- - Appraise and evaluate the economic value of animals for various applications in the agriculture industry.
- - Locate and obtain information on animal-industry careers and career opportunities.
- - Examine professional organizations and commodity groups in the animal industry and supporting organizations.
- - Practice safe procedures when working with animal-related equipment in laboratory and field settings.
- - Understand animal behaviors as they relate to practicing safety precautions around animal restraint.
- - Define zoonosis and identify selected zoonotic diseases.

#### ***Unit: Animal Science - Agricultural Animal Classification and OSHA Compliance***

##### Learning Objectives:

- - Discuss OSHA as it relates to the animal industry.
- - Explain how agricultural animals are classified according to their physical traits, breeds, uses, and scientific classification.
- - Explain the use of the binomial system of classification.
- - Identify characteristics of animals that place them in different classifications.
- - Explain how breeds of livestock were developed.
- - Identify characteristics that can be used to group animals.
- - Categorize common and distinguishing characteristics of several agricultural animals (cattle, horses, sheep, goats, swine, and poultry).
- - Distinguish between carnivores, omnivores, and herbivores and give examples.

#### ***Unit: Animal Science - Animal Anatomy and Physiology***

##### Learning Objectives:

- - Identify parts, major organ, and functions, of animals using correct terminology.
- - Compare and contrast animal body systems types and functions among animal species.
- - Identify the general function of the skeletal system and the major bones of the axial and appendicular skeleton.
- - Identify the general function of the nervous system and the major organs.
- - Identify the general function of the muscular system and major groups of muscles.
- - Identify the general function of the digestive system.
- - Differentiate between ruminants and non- ruminants (monogastric and hind gut fermenters) and the major organs.

- - Identify the general function of the respiratory system and the major organs.

#### *Unit: Animal Science - Unit Sim*

##### Learning Objectives:

- - Understand livestock external anatomy
- - Understand cow ID identification
- - Understand primal cuts
- - Understand livestock digestive system

#### *Unit: Animal Science - The Foundations of Animal Biology: Organ Systems, Cell Division, and Sexual Reproduction*

##### Learning Objectives:

- - Identify the general function of the urinary system and the major organs.
- - Identify the general function of the reproductive system and both male and female organs.
- - Compare and contrast animal cells among animal species.
- - Identify the stages of body and sex cell division.
- - Identify how the sex of an embryo is determined.
- - Compare and contrast external organs among animal species.
- - List and define the function of the organs of monogastric digestive systems.
- - List and define the function of the organs of ruminant digestive systems.
- - Correlate the functions of animal cell structures to animal growth, development, health, and reproduction.

#### *Unit: Animal Science - Ethology and Animal Behavior in Agricultural Production*

##### Learning Objectives:

- - Describe the importance of ethology in the production of agricultural animals.
- - Differentiate between instinctive and learned behaviors of animals.
- - Describe the conditioning response and its use in animal production.
- - Explain how animal behaviors are developed.
- - Infer how unusual stimuli and surroundings affect animals.
- - Examine how cattle view their surroundings and how that behavior is used to design cattle facilities.
- - Describe and identify social, dominant, flight, and protective behaviors in animals.
- - Investigate the social behaviors of agricultural animals.
- - Identify dominant animals in a group.
- - Discuss how dominant behavior contributes to natural selection.
- - Analyze the types of sexual and reproductive behaviors in agricultural animals.



- - Describe the methods used by agricultural animals to communicate.
- - Describe the types of ingestive behaviors in agricultural animals.
- - Explain how the natural behaviors of agricultural animals can be used to provide the animals with a safer, more comfortable environment.

***Unit: Animal Science - Animal Husbandry and Welfare: A Comprehensive Guide***

Learning Objectives:

- - Devise, implement, and evaluate safety procedures and plans for working with animals by species using information based on animal behavior and responses.
- - Analyze and document animal husbandry practices and their impact on animal welfare.
- - Examine how the proper care and use of animals can prevent abuse or mistreatment.
- - Identify quality-assurance programs and procedures for animal production.
- - Explain the early stages of animal development, from fertilization up through the formation of the blastula.
- - Describe the gastrulation process and organogenesis processes that result in the formation of organs and growth in size.
- - Describe animal growth and development over infancy, childhood, puberty, and adulthood.
- - Analyze the process of reproductive technologies such as artificial insemination, in vitro, multiple ovulation, embryonic transfer, sexed semen, and cloning.
- - Explain different reproduction techniques associated with sheep, cattle, horses, goats, swine, and poultry.
- - Describe the effects of hormones in the growth process.
- - Explain the aging process in animals and distinguish between chronological and physiological age.
- - Identify characteristics of twenty-four, forty-eight, and seventy-two hour old chick embryos.
- - Sequence fat deposition in an animal's body.
- - Investigate and explain why selection for muscling in animals is important.
- - Analyze the circumstances of growth that affect production enterprises such as breeding efficiency, feed control, animal health, and profitability.

***Unit: Animal Science - Nutritional Requirements and Feed Management for Animals***

Learning Objectives:

- - List nutrients that are essential to the growth and development of animals.
- - Describe the role water plays in supporting animal growth and development.
- - Discuss the relationship between proteins and amino acids.
- - Identify protein feed sources.

- - Explain the role and importance of protein, carbohydrates, and fats in the diets of animals.
- - List the sources of fats, minerals, vitamins, roughages, starches, sugars, proteins, etc., in animal rations.
- - Discuss the role that minerals play in animal growth and development.
- - Explain the differences in feed used by monogastrics and feed used by ruminants.
- - Calculate the feed and water necessary for a group of livestock.

#### *Unit: Animal Science - Parasites, Diseases, and Their Impact on Agricultural Animals*

##### Learning Objectives:

- - Discuss how parasitism causes harm to the host animal.
- - Identify parasites of agricultural animals and match the parasite to the host.
- - Diagram the phases of a parasite's life cycle and identify how knowledge of life cycle can be used to control the parasite.
- - Differentiate between internal and external parasites.
- - Explain the conventional means of controlling parasites of agricultural animals.
- - Describe how disease vaccines are developed and the success of their uses.
- - Describe how diseases are spread and prescribe methods to limit infection.
- - List examples of diseases caused by genetic disorders.
- - Identify and give examples of diseases caused by improper nutrition.
- - Identify plants that are poisonous to agricultural animals.
- - Identify signs and symptoms that are used to recognize and quarantine sick animals.
- - List and discuss agricultural animal diseases caused by microorganisms.
- - Determine sources of disease-causing organisms in the environment.
- - Learn to diagnose common animal diseases.

#### *Unit: Animal Science - Fundamentals of Livestock Care and Management*

##### Learning Objectives:

- - Identify and describe basic nonsurgical treatments and procedures in livestock.
- - Identify and describe basic surgical treatments and procedures in livestock.
- - Identify tools used for basic surgical procedures in livestock.
- - Examine proper injection methods and techniques in animals.
- - Differentiate between animal control agencies and humane societies.
- - Explain the laws governing animal care and use.
- - Analyze the growth and development of the livestock industry as a global commodity.
- - Investigate local, state, and national regulatory laws, industry regulations, and legislation for animal agriculture businesses.
- - Identify and describe the primary government agencies involved with animal agriculture.

- - Research new and emerging technologies in animal agriculture and their impact on the economy.
- - Identify the different Animal ID Systems associated with sheep, cattle, horses, goats, sine, and poultry.
- - Recognize the value of the food and agribusiness industry.

### **Culinary (Video and VR)**

#### ***Unit: Culinary - Culinary Fundamentals: Mastering Techniques and Tools***

##### Learning Objectives:

- - Display understanding of cooking terminology.
- - Demonstrate how to read and follow standard recipes.
- - Demonstrate an understanding of the purpose of standardized recipes.
- - Explain and establish mise en place.
- - Identify, explain, and distinguish knife types and basic cuts.
- - Demonstrate proper knife care.
- - Demonstrate how to properly sharpen a knife using stone and steel.
- - Demonstrate the ability to chop, mince, cube, dice, julienne, and/or slice

#### ***Unit: Culinary - Kitchen Fundamentals: Equipment Organization, Safety, and Techniques***

##### Learning Objectives:

- - Demonstrate how to organize kitchen equipment and use the tools and kitchen equipment appropriately.
- - Demonstrate boiling and cooling eggs, secure the cutting board, peel eggs and cucumber, seed the cucumber and cut properly.
- - Identify and demonstrate proper use of measuring devices.
- - Identify large and small kitchen equipment.
- - Demonstrate proper use and care of large and small equipment.

#### ***Unit: Culinary - Culinary Safety and Sanitation: A Comprehensive Guide***

##### Learning Objectives:

- - Identify basic principles of nationally recognized sanitation protocols.
- - Identify and apply sanitary procedures in maintaining the facility, including proper waste disposal methods and recycling.
- - Demonstrate proper food handling techniques (thermometer use; thawing methods; internal cooking temperatures) utilizing current industry safety and sanitation procedures for the agency having jurisdiction.
- - Identify prevention methods, causes, and responses to workplace injuries.

- - Identify and utilize first-aid procedures for accidents and injuries common to the food service industry.
- - Demonstrate and utilize safety procedures related to prevention of slips, falls, burns, and fire; proper lifting and chemical use.

***Unit: Culinary - Culinary Safety and Sanitation: A Foundation for Food Excellence***

Learning Objectives:

- - Demonstrate and utilize proper personal hygiene and personal health precautions (hand washing; use of gloves; grooming; proper hair restraints, closed-toe shoes, aprons, uniforms).
- - Identify the HACCP (Hazard Analysis Critical Control Point) procedure during all food handling processes.
- - Identify food allergen characteristics.
- - Prepare and complete physical and perpetual inventory.

***Unit: Culinary - Unit Sim***

Learning Objectives:

- - Create unique dishes and put your culinary knowledge to the test

***Unit: Culinary - Culinary Fundamentals: Nutrition, Techniques, and Techniques***

Learning Objectives:

- - Identify the basic food groups and how to make healthy food choices.
- - Explain healthy cooking techniques.
- - Explain the primary functions and food sources of major nutrients.
- - Explain food and dietary trends, such as farm-to-table, organics, religious, and dietary concerns.
- - Identify herbs and spices.
- - Identify food products that are a result of fermentation.
- - Convert weights and measurements using standard recipes.
- - Demonstrate mastery of standard weights and measures used in the food service industry.
- - Calculate guest check with tax and gratuity.
- - Identify and prepare salads and dressings.
- - Prepare salad and vinaigrette that are presented well and taste correct.

***Unit: Culinary - Culinary Foundations: Essential Techniques and Ingredients***

Learning Objectives:

- - Prepare appetizers, and entrees.

- - Prepare cold garnishes.
- - Prepare sandwiches, spreads, and fillings.
- - Identify fruits and vegetables.
- - Prepare fruits and vegetables for cooking.

#### ***Unit: Culinary - Fundamentals of Baking and Stocks***

Learning Objectives:

- - Identify and prepare potato dishes.
- - Identify and prepare pasta, grains, and legumes.
- - Identify and explain the various leavening agents used in baking.
- - Explain the leavening process in baking.
- - Demonstrate and analyze the different functions of sugar and fats in baked goods.
- - Prepare batters and doughs using appropriate mixing methods.
- - Prepare standard dessert items.
- - Identify the four essential components of stock.
- - Prepare and flavor stocks using bones or base.

#### ***Unit: Culinary - Thickening Agents and Sauces***

Learning Objectives:

- - Identify and explain the principles of thickening agents used in food preparation.
- - Prepare roux and thickening agents.
- - Explain the characteristics of the grand/mother/leading sauces.
- - Demonstrate the methods of preparation of sauce.

#### ***Unit: Culinary - Fundamentals of Culinary Techniques and Ingredients***

Learning Objectives:

- - Identify and describe the two classifications of soups.
- - Demonstrate the methods of preparation of soups.
- - Identify meat and poultry, including grade and inspection.
- - Identify various cooking methods.
- - Determine proper degrees of doneness.
- - Identify market forms of fish and seafood.
- - Identify various cooking preparations and methods.
- - Identify and prepare breakfast starches.
- - Identify and prepare breakfast meats.

#### ***Unit: Culinary - Eggs, Dairy, and Industry Essentials***

Learning Objectives:

- - Describe various job positions and chain of command in the food service industry.
- - Identify and prepare different styles of eggs.
- - Prepare a cheese omelet that appears and tastes correct.
- - Identify and prepare cereals.
- - Identify and use various dairy products, such as cheese, sour cream, butter, yogurt, creams, and milk.
- - Prepare foods with a variety of cheese.
- - Identify and exhibit professional behavior, appearance, and interviewing skills for the food service industry.

### **Veterinary Science (Video & VR)**

#### ***Unit: Veterinary Science - The Evolution of Veterinary Science: A Historical and Contemporary Perspective***

##### **Learning Objectives:**

- - Define veterinary science.
- - Identify key components in the domestication of animals.
- - Choose current issues facing the animal industry today and describe the effect of each on society.
- - Summarize the history of the veterinary science, companion animal, and livestock industry.
- - Discuss the role of companion animals on the veterinary science industry.
- - Discuss the role of livestock animals on the veterinary science industry.
- - Explain the human and animal bond.
- - List and describe the ways in which animals are a part of human lives.

#### ***Unit: Veterinary Science - Human-Animal Bond: Health Benefits, Therapeutic Applications, and Veterinary Terminology***

##### **Learning Objectives:**

- - Discuss the positive health effects on people resulting from their interaction with animals.
- - Discuss programs that use human-animal interaction as a therapy tool.
- - Discuss the stages of grief from an animal loss.
- - Define common veterinary and medical terms, including directional terminology.
- - Compile a list of prefixes, suffixes, and root words for veterinary medical terminology.
- - Categorize species-related terminology.
- - List and provide examples of abbreviations commonly used in veterinary medicine.

***Unit: Veterinary Science - Veterinary Science Careers: Exploring Opportunities, Safety, and Regulations***

Learning Objectives:

- - Explore career opportunities in veterinary science.
- - Investigate career opportunities in the veterinary science, companion animal, and large animal industry; also identify degree or credential needed to prepare for those careers.
- - Investigate requirements necessary to earn and maintain Veterinary Assisting Certification.
- - Recognize and avoid potential safety hazards, including physical, chemical, biological, and zoonotic.
- - Examine proper safety precautions and procedures when working in the hospital and/or animal handling areas.
- - Demonstrate knowledge of how to use personal protective equipment, including wearing gloves, goggles, facemasks, earplugs, aprons, gowns, caps, and shoe covers when needed.
- - Demonstrate knowledge of OSHA regulations regarding the handling, placement, and disposition of sharps and biohazard material.

***Unit: Veterinary Science - Animal Safety and Behavior: Handling Hazardous Materials and Understanding Animal Reactions***

Learning Objectives:

- - Handle and use disposable SHARPS containers in a safe manner.
- - Explain the correct labeling of secondary containers with appropriate safety information.
- - Practice safety precautions around animals, list the most common causes of animal related accidents.
- - Identify instinctive and learned behaviors.
- - Differentiate between normal and abnormal behavioral characteristics of animals.
- - Recognize signs of aggressive animal behaviors.
- - Describe behavioral changes due to aging.

***Unit: Veterinary Science - Unit Sim***

Learning Objectives:

- - Identify tools and equipment
- - Wrap a general surgical pack
- - Read and fill syringes

***Unit: Veterinary Science - Handling and Restraining Animals for Veterinary Procedures***

## Learning Objectives:

- - Discuss the proper method for placing large animals in a stall, paddock, and trailer.
- - Safely handle and restrain dogs, cats, and other animals for exams, procedures, and treatment to prevent undue stress or harm to either animals or humans using the procedure-lifting, positioning, and restraining animals.
- - Safely handle and restrain dogs, cats, and other animals for exams, procedures, and treatment to prevent undue stress or harm to either animals or humans using the procedure-position an animal in sternal dorsal and lateral recumbency.
- - Safely handle and restrain dogs, cats, and other animals for exams, procedures, and treatment to prevent undue stress or harm to either animals or humans using the procedure-restraint of a small dog on an exam table.
- - Safely handle and restrain dogs, cats, and other animals for exams, procedures, and treatment to prevent undue stress or harm to either animals or humans using the procedure-restraint of a cat on an exam table.
- - Safely handle and restrain dogs, cats, and other animals for exams, procedures, and treatment to prevent undue stress or harm to either animals or humans using the procedure-restraint of a large dog on and exam table, lift table, and on the floor.
- - Safely handle and restrain dogs, cats, and other animals for exams, procedures, and treatment to prevent undue stress or harm to either animals or humans using the procedure-place a lead on a dog slip lead and standard leash.

***Unit: Veterinary Science - Handling and Restraining Animals for Veterinary Procedures Pt. 2***

## Learning Objectives:

- - Explain appropriate methods for placing and removing animals from kennels.
- - Demonstrate restraint techniques for the femoral, cephalic, jugular, and saphenous veins of a dog and cat, including restraint for drug vaccine administration.
- - Demonstrate the use of muzzle on a dog using commercial, leash, and gauze muzzles of appropriate size.
- - Demonstrate currently accepted standards for restraint of the cat including towels, scruff technique, commercial muzzles, cat bags, leather gloves, and the squeeze cage.
- - Recognize and implement common anatomical terminology for companion animals.
- - Identify common intramuscular injection sites.
- - Identify sites for measuring pulses and collecting blood samples.

***Unit: Veterinary Science - The Anatomy and Physiology of Companion Animals***

## Learning Objectives:

- - Describe the functions of the skeletal and muscular systems.
- - Describe the functions of the circulatory and respiratory systems.



- - Describe the functions of the renal and digestive systems.
- - Describe the functions of the reproductive, endocrine, and nervous systems.
- - Identify and relate the bones of the skeleton to a live animal.
- - Describe the functions and types of muscle tissues found in companion animals.
- - Describe the functions and types of connective tissues found in companion animals.
- - Identify and describe the parts of the upper and lower respiratory tract.
- - Identify and describe the parts of nerve cells and the brain.

***Unit: Veterinary Science - Homeostasis, Disease Diagnosis, and Prevention in Veterinary Medicine***

Learning Objectives:

- - Interpret how the body seeks to maintain a state of homeostasis.
- - Correctly operate the stethoscope, otoscope, and ophthalmoscope.
- - Summarize the principles of infectious disease, including its identification, prevention, and treatment.
- - Describe the major classifications of diseases and their underlying causes.
- - Explain the methodology of diagnosing diseases.
- - Describe the components of disease prevention and their application in a clinical setting.
- - Describe the general clinical signs of an animal with a parasite infestation.
- - Diagram the life cycles of internal and external parasites.
- - Properly use a microscope to scan for parasite eggs.

***Unit: Veterinary Science - Laboratory Techniques and Animal Care***

Learning Objectives:

- - Perform common laboratory procedures for diagnosing parasites.
- - Summarize the modes of transmission, life cycle, including the procedures commonly used to determine the effect on the host and treat for parasitic infestation.
- - Clean, prepare, and sterilize surgical instruments, equipment, and supplies, and operate autoclave.
- - Identify common instruments used in surgical procedures.
- - Select, identify, and use equipment for grooming procedures, such as trimming nails, bathing, and cleaning ears.
- - Perform post-surgical clean up.
- - Calculate medication amounts for animals.
- - Properly label medications.
- - Demonstrate completing vaccinations schedules and reading and filling syringes.

### ***Unit: Veterinary Science - Veterinary Procedures and Patient Care: Essential Techniques and Safety Protocols***

#### Learning Objectives:

- - Demonstrate bandaging an animal.
- - Demonstrate brushing teeth of an animal.
- - Collect voided urine samples and examine them using techniques to measure their physical properties, sediment, and specific gravity.
- - Prepare supplies for blood collection and identify common blood tubes used in veterinary medicine.
- - Collect voided fecal samples and examine them for abnormalities using the direct smear, flotation, and centrifugation methods.
- - Explain the correct use of personal protection equipment including lead-shielded gowns, lead gloves, lead thyroid shield, lead glasses, and other lead protective wear. Discuss restrictions from radiation exposure protocols for pregnant women and minors.
- - Explain the proper handling of radiographic film including safe light use.
- - Demonstrate the appropriate labeling of a radiograph including date, patient name, view or side of patient, machine settings, and film developing.

### **Open Textbooks**

#### **Basic Kitchen and Food Service Management**

##### ***Unit: 06: Appendix and Terminology***

#### Learning Objectives:

- - Completion

##### ***Unit: 01: Trade Math***

#### Learning Objectives:

- - Demonstrate the use of the metric and imperial/U.S. measuring systems
- - Convert and adjust measurements, recipes, and formulas

##### ***Unit: 04: Labor Costing***

#### Learning Objectives:

- - Describe labour cost controls
- - Describe the principles of planning personnel requirements

##### ***Unit: 02: Inventory Control***

#### Learning Objectives:

- - Describe basic inventory procedures
- - Take a basic inventory
- - Extend a basic inventory
- - Apply ordering and purchasing procedures

### ***Unit: 03: Food Costing***

Learning Objectives:

- - Describe food cost controls
- - Perform yield and cost calculations
- - Cost and price menu items
- - Describe overall food costs
- - Describe the principles of menu engineering

### ***Unit: 05: Budget and Business Planning***

Learning Objectives:

- - Describe the basic calculation of operating costs
- - Describe budgets and profit/loss statements
- - Interpret point-of-sale information

## **CVM Large Animal Anatomy**

### ***Unit: AG 04: Cvm Large Animal Anatomy 01: Limbs***

Learning Objectives:

- - Understand the anatomical structures and functions of the thoracic limb in bovine and equine species, including the bones, joints, muscles, and associated structures
- - Analyze the anatomy of the distal limb in bovine and equine species, with a focus on the hoof, bones, tendons, ligaments, and vasculature, and their importance in locomotion and support.
- - Evaluate the anatomical features and biomechanics of the pelvic limb in bovine and equine species, including the hip, stifle, hock, and foot structures, and their role in movement, weight-bearing, and stability.
- - Examine clinical aspects related to the limbs in bovine and equine species, such as common injuries, lameness conditions, and diagnostic techniques used in veterinary practice to assess and treat limb disorders.

### ***Unit: AG 04: Cvm Large Animal Anatomy 02: Neck and Thorax***

Learning Objectives:

- - Identify and describe the anatomical structures of the neck and thorax in bovine and equine species, including the bones, muscles, nerves, blood vessels, and organs present in these regions.
- - Explain the functional significance of the anatomical features of the neck and thorax in bovine and equine species, such as their role in supporting the head, facilitating movement and posture, and housing vital organs involved in respiration and circulation.
- - Analyze the clinical implications related to the neck and thorax in bovine and equine species, including common diseases, injuries, and conditions that affect these regions, as well as diagnostic approaches and treatment options employed in veterinary practice.

### Cheese Making Technology

#### *Unit: AG 07: Cheese Making Technology Book: 01. Introduction to Cheese Making*

##### Learning Objectives:

- - Calculate the optimal time between adding culture and adding rennet in cheese making to ensure proper fermentation and curd formation.
- - Determine the total time between cutting and draining in the cheese making process to achieve desired curd consistency and texture.
- - Evaluate the total time between draining and salting in cheese making, specifically for vat salted varieties, to ensure appropriate flavor development and salt absorption.
- - Classify and differentiate various cheese families, including predominantly acid-coagulated cheese, rennet coagulated fresh cheese, heat-acid precipitated cheese, soft-ripened cheese, semi-hard washed cheese, mesophilic firm/hard cheese varieties, and high-temperature hard cheese.
- - Analyze and apply various technical criteria in cheese making, including species selection, milk standardization, coagulation techniques, moisture control, type of pH control, extent of acid development, salting procedures, type and duration of ripening, type of rind formation, texture of rind, texture and body characteristics, and melting properties.

#### *Unit: AG 07: Cheese Making Technology Book: 02. Process and Quality Control Procedures*

##### Learning Objectives:

- - Develop proficiency in general analytical requirements for conducting chemical and microbial analyses, including analytical quality control, proper sampling techniques for chemical analysis, and appropriate sampling methods for microbial analysis.
- - Gain competence in analyzing and measuring total solids content in dairy products, utilizing the Babcock method for determining milk fat content, understanding the role and impact of cheese salt in cheese making, and identifying inhibitory substances that may affect the quality and safety of dairy products.

- - Acquire proficiency in performing culture activity tests to assess the fermentation activity and effectiveness of cultures used in cheese making, and conduct rennet activity tests to evaluate the coagulation properties and enzymatic activity of rennet in cheese production.
- - Develop a thorough understanding of acidity and pH concepts in the context of cheese making, including buffer capacity and its role in maintaining pH stability, accurate pH measurement techniques, the relationship between titratable acidity and pH, and the concept of titratable acidity as a measure of acid content in cheese.

***Unit: AG 07: Cheese Making Technology Book: 03. Milk***

Learning Objectives:

- - Master the knowledge of the principal components of milk and their roles in cheese making, understand the various factors that can influence milk composition, comprehend the suitability of milk as a growth medium for microorganisms, identify different types of microorganisms and their activities in milk, recognize the implications of mastitis milk and the use of antibiotics, and become proficient in conducting raw milk quality tests to ensure safety and quality in cheese production.
- - Demonstrate proficiency in selecting and implementing appropriate heat treatments, homogenization techniques, and additives to cheese milk, resulting in the production of high-quality cheese with clarified characteristics.
- - Comprehend the important parameters of composition, identify and analyze the factors affecting standardization, recognize various sources of milk solids, apply different types of standardization techniques, perform relevant calculations, and apply general guidelines for effective milk standardization.

***Unit: AG 07: Cheese Making Technology Book: 04. Acidification and Coagulation***

Learning Objectives:

- - Understand the general functions of cheese cultures.
- - Differentiate between lactic acid cultures and secondary cultures
- - Recognize the impact of bacteriophages (bacterial viruses) on cheese production and quality.

***Unit: AG 07: Cheese Making Technology Book: 05. Manufacturing, Ripening, Process Control and Grading***

Learning Objectives:

- - Execute the entire cheese production process, including ripening the milk, setting the vat, cutting the curd, cooking, draining, washing, curd handling, pressing, and salting, resulting in the production of high-quality cheeses with optimal flavor, texture, and consistency.

- - Demonstrate comprehensive knowledge and skills in understanding and applying the biochemical and biophysical changes during ripening processes, utilizing principal ripening agents, determining optimal cheese composition for curing, controlling temperature and humidity of curing, implementing various ripening treatments, and employing appropriate packaging techniques to ensure the production of high-quality cheeses with desirable flavor, texture, and aroma profiles.
- - achieve the objectives of cheese production by demonstrating proficiency in controlling and manipulating moisture levels, pH balance, mineral content, and flavor profiles. This will enable them to produce high-quality cheeses that meet industry standards and possess desired characteristics, including optimal moisture control, balanced pH levels, controlled mineral content, and well-developed flavors.
- - Identify and classify defects in cheese production, as well as apply appropriate grading criteria to assess the quality and characteristics of different types of cheese.

***Unit: AG 07: Cheese Making Technology Book: 06. Composition and Yield Control***

Learning Objectives:

- - Understand and analyze the distribution of components during cheese making, including the various factors that contribute to cheese yield.
- - Identify and assess the cheese yield factors that can be controlled at the farm level, such as milk composition, animal management, and feed quality.
- - Identify and implement strategies to control cheese yield factors during processing, including milk handling, curd cutting, cooking, and whey drainage.
- - Proficiently calculate the actual or absolute cheese yield ( $Y_a$ ) by considering the components and their distribution during cheese making.
- - Calculate predicted cheese yields using the Can Slyke and Price formula, enabling them to optimize cheese production and make informed decisions in the industry.
- - Utilize the formula to estimate cheese yield based on key parameters such as milk composition, fat-to-protein ratio, and moisture content.

***Unit: AG 07: Cheese Making Technology Book: 07. Cheese Safety***

Learning Objectives:

- - Manage risks in cheese production, ensuring safety, quality, and regulatory compliance.
- - Develop and implement risk management strategies to mitigate and control identified risks, ensuring the production of safe and high-quality cheeses.

***Unit: AG 07: Cheese Making Technology Book: 08. Some Alternate Technologies***

Learning Objectives:

- - Produce high-quality low-fat cheeses by understanding the importance of fat, analyzing the current status, evaluating effects on composition, addressing defects, and developing effective make schedules.
- - Utilize ultrafiltration in the cheese industry by understanding its principles, analyzing milk retentate properties, and exploring its applications for improved production.
- - Evaluate the varieties of cheese substitutes available in the US, understand the types of substituents used, and assess the feasibility of developing a cheddar cheese substitute.

***Unit: AG 07: Cheese Making Technology Book: 09. Ways to Use Whey***

Learning Objectives:

- - Evaluate the composition, properties, and general processing options of whey to maximize its utilization.
- - Identify and apply various uses of whey in different industries and applications based on its unique properties and nutritional components.

***Unit: AG 07: Cheese Making Technology Book: 10. Selected Recipes***

Learning Objectives:

- - Understand the production methods, characteristics, and flavor profiles of Feta, Camembert, and Blue cheeses.
- - Describe the characteristics, production methods, and unique qualities of Brine Brick, Colby, Gouda, and Montasio (Friulano) cheeses.
- - Identify and compare the characteristics, production methods, and flavor profiles of Provolone and Cheddar cheeses.
- - Analyze the production methods, characteristics, and flavor profiles of Romano and Swiss type cheeses.
- - Examine the production methods, characteristics, and applications of cottage cheese (short set), quark, and cream cheese.
- - Understand and apply the standards and regulations, ingredients, process systems, microbiology, calculations, and procedures involved in producing high-quality cheese

**Chemistry of Food and Cooking 1**

***Unit: Chapter 01: Essential Ideas***

Learning Objectives:

- - Understand basic chemistry
- - Understand the Scientific Method
- - Understand matter and its phases
- - Understand atoms and molecules

***Unit: Chapter 02: Atoms***

Learning Objectives:

- - Understand physical vs. chemical properties and changes.
- - Understand crystallization.
- - Understand classification of matter.
- - Understand element names and symbols.
- - Understand the Periodic Table.
- - Understand the anatomy of an atom.
- - Understand Atomic Number, Mass Number, and Isotopes.

***Unit: Chapter 03: Measurements***

Learning Objectives:

- - Understand Measurements and Units.
- - Understand SI Unit (Metric) Prefixes.
- - Understand the International System of Units (SI Units).
- - Understand the U.S. System of Measurements.
- - Understand density.
- - Understand unit conversions.

***Unit: Chapter 04: Energy Processes***

Learning Objectives:

- - Understand energy.
- - Understand calories: Energy Units
- - Understand Thermal Energy, Temperature and Heat.
- - Understand exothermic and Endothermic energy.
- - Understand Phase Changes

***Unit: Chapter 05: Compounds***

Learning Objectives:

- - Understand compounds.
- - Understand ions.
- - Understand ionic compounds.
- - Understand salt: A Common Ionic Compound.
- - Understand covalent compounds.
- - Understand the difference between ionic and covalent.

***Unit: Chapter 06: Molecules***

Learning Objectives:



- - Understand Shapes of Molecules
- - Understand Electronegativity and Bond Polarity
- - Understand Polarity of Molecules
- - Understand Properties of Covalent Compounds

***Unit: Chapter 07: Chemical Reactions***

Learning Objectives:

- - Understand Chemical Reactions.
- - Understand yeast.
- - Understand chemical Reaction Equations.

***Unit: Chapter 08: Carbohydrates***

Learning Objectives:

- - Understand carbohydrates.
- - Understand diabetes.
- - Understand structures of Monosaccharides.
- - Understand common Monosaccharides.
- - Understand artificial Sweeteners.
- - Understand disaccharides.
- - Understand polysaccharides.

***Unit: Chapter 09: Fats and Oils***

Learning Objectives:

- - Understand Fats and Oils.
- - Understand saturated and Unsaturated Fatty Acids.
- - Understand trans Fats.
- - Understand fats and oils.
- - Understand soap.
- - Understand hydrogenation and Oxidation
- - Understand cholesterol.

***Unit: Chapter 10: Proteins***

Learning Objectives:

- - Understand proteins.
- - Understand insulin.
- - Understand trans fats.
- - Understand amino acids.
- - Understand peptides.

- - Understand proteins and their structure.
- - Understand denaturation.

### **Clinical Medicine 1: Small Animal Clinical Skills Textbook**

#### ***Unit: AG 06: Clinical Medicine 1 Small Animal Clinical Skills: Unit 1***

##### Learning Objectives:

- - Practice safe ways to approach a dog
- - Practice performing restraint of a standing dog
- - Practice performing restraint of a sitting dog
- - Practice transitioning a standing dog into lateral recumbency, and performing restraint of a dog in lateral recumbency
- - Practice applying muzzle to a dog
- - Practice performing a ring hold on a stuffed cat
- - Practice performing a three-finger hold on a stuffed cat
- - Practice performing at least one towel wrap on a stuffed cat
- - Understand how to place a muzzle on a cat
- - Locate and gently occlude the following veins on a dog
- - locate an appropriate site for intramuscular injection
- - locate an appropriate site for subcutaneous injections
- - \*\*\*

#### ***Unit: AG 06: Clinical Medicine 1 Small Animal Clinical Skills: Unit 2***

##### Learning Objectives:

- - Identify a "problem list" for the medical record, based on information generated from the client interview
- - Assess the circle of nutrition, through identification of animal-specific, diet-specific and feeding and environmental factors
- - Identify nutritional risk factors using the WSAVA risk factor list. If you need a reminder of the nutritional risk factor list: WSAVA Diet History Form and Nutritional Risk Factors
- - Identify human-related factors, client expectations and concerns that will need to be accounted for when developing a diet plan

#### ***Unit: AG 06: Clinical Medicine 1 Small Animal Clinical Skills: Unit 3***

##### Learning Objectives:

- - Conduct an observational examination
- - Manage tips on hydration assessment
- - Understand body condition scoring on cats
- - Understand body condition scoring on dogs

- - Understand muscle condition scoring
- - understand the animals' skull, eyes, ears, nose, mouth, salivary glands and neck
- - Understand the animals' mandibular lymph nodes, superficial cervical ("prescapular") lymph nodes and the popliteal lymph nodes
- - Understand the cardiovascular system
- - understand the respiratory system
- - Identify the organs' location and description
- - Examine skin and haircoat
- - Examine mammary glands
- - Understand gait, stance and limb evaluation
- - conduct a rectal exam
- - Examine the tail

***Unit: AG 06: Clinical Medicine 1 Small Animal Clinical Skills: Unit 4***

Learning Objectives:

- - Practice proper stethoscope use
- - understand the normal heart rate and respiratory rate ranges for dogs and cats
- - Examine mucous membranes and recognize normal appearance
- - Examine jugular vein and recognize normal appearance
- - Identify and palpate the precordial region
- - Identify and palpate the femoral arterial pulse
- - Describe what S1 and S2 are in relation to heart sounds
- - Use proper stethoscope positioning and relevant anatomy to detect normal heart sounds
- - Begin to develop familiarity with normal and abnormal heart and lung sounds
- - Understand basic physiology of abnormal heart and lung sounds
- - Practice auscultating the cadence of the normal heart rhythm
- - palpate precordium and arterial pulse simultaneously to detect any pulse deficits
- - auscult the heart and palpate arterial pulse simultaneously to detect any pulse deficits
- - Detect a sinus arrhythmia, if present in your group's dog
- - Observe respiratory rate and rhythm prior to auscultation
- - Use proper stethoscope positioning and relevant anatomy to detect normal respiratory sounds

***Unit: AG 06: Clinical Medicine 1 Small Animal Clinical Skills: Unit 5***

Learning Objectives:

- - Identify/confirm presence of a neurological problem
- - Localize the lesion with the nervous system
- - assess severity/extension lesions, and provide a prognosis

- - Identify different mental status' such as: alert, depressed, stuporous and comatose
- - Understand gait and posture topics such as ataxia, paresis, lameness and general posture
- - Manage the assessment of cranial nerves, including menace response, pupillary light reflexes (PLRs), physiological nystagmus-strabismus, palpebral reflex, nasal septum sensation, masticatory muscles, facial symmetry- ears, eyelids, nose, lips, laryngeal-pharyngeal function and tongue function
- - Understand postural reactions, including proprioceptive positioning and hopping
- - Understand the spinal reflexes, such as patellar reflexes, flexor reflexes, perineal reflex and cutaneous trunci reflex
- - Understand palpation, including spinal palpation, palpation of the limbs and deep pain perception
- - perform a complete neurological examination
- - Understand physical and orthopedic examination to proceed it
- - Localize the lesion before work up

## Culinary Math

### Unit: Culinary Math

#### Learning Objectives:

- - Read word problems for understanding, looking for clue words.
- - Correctly solve word problems using the four basic processes.
- - Read ratio and proportion word problems for understanding.
- - Correctly set up and solve ratio and proportion word problems.
- - Calculate the conversion factor to adjust a recipe yield.
- - Use the conversion factor to adjust the ingredients in a recipe.
- - Understand how a recipe ratio is set up.
- - Determine the correct amounts of each ingredient in a recipe given as a ratio between its parts.
- - Read and understand real-world percent problems related to culinary math.
- - Correctly set up the problems as proportions and solve for the missing value.
- - Understand different types of business costs.
- - Do some math related to basic budgeting of business costs.
- - Understand different types of benefits and how they affect a budget.
- - Know the relationships between weight and volume measurements in the common system.
- - Use factor labeling to make conversions between common measurements.
- - Understand the most likely measurement of volumes and weights in the metric system.
- - Make conversions for measurements in the metric system using factor labeling.

- - Use a bread recipe to calculate bakery percentages.
- - Use bakery percentages to modify a bread recipe.
- - Use bridges to convert between the common and the metric system.
- - Make conversions with more than one step using factor labeling.
- - Use a conversion chart to understand the relationships between volume and weight for different kinds of food.
- - Use factor labeling to make conversions, including those that involve three or more steps.
- - Find the usable portion of food using the yield percent chart.
- - Determine the amount of food you need to buy using the yield percent chart.
- - Use the formula given to make calculations.
- - Calculate the edible portion cost when given the as-purchased cost.
- - Find the cost per unit of a particular item by converting weights, volumes, and unit prices with factor labeling
- - For conversions between volume and weight, you should use the conversion on the chart given in Chapter 12.
- - Adjust cost for yield percentage.
- - Find the total cost of a menu item, as well as the cost per serving.

### **Farming as We Know It: How Humans are Impacting Agriculture**

#### ***Unit: Farming as We Know It: How Humans are Impacting Agriculture***

Learning Objectives:

- - Urbanization
- - Soil Conservation
- - Shortage of Labor

### **Food Safety, Sanitation and Personal Hygiene (Open Textbook)**

#### ***Unit: Food Safety, Sanitation, and Personal Hygiene***

Learning Objectives:

- - Describe food safety regulations.
- - Describe the causes and prevention of foodborne illnesses.
- - Describe the principles of Hazard Analysis Critical Control Points (HACCP).
- - Describe general food-handling and storage procedures.
- - Describe the procedures for maintaining workplace sanitation and personal hygiene.

## History and Science of Cultivated Plants (Open Textbook)

### *Unit: AG 03: History and Science of Cultivated Plants*

#### Learning Objectives:

- - Understand the transition of human societies from foraging to farming and the role of cultivated plants in shaping civilizations.
- - Comprehend the concepts of natural selection and domestication, and how they have influenced the evolution of crop plants.
- - Explore the principles and techniques of experimental and methodical plant breeding, as well as the basics of plant biotechnology and genetically engineered crops.
- - Analyze the societal impacts of genetically engineered crops and the ethical considerations surrounding their use.
- - Evaluate the challenges and constraints faced by modern agriculture in feeding a growing global population, and recognize the need for sustainable agricultural practices in the face of climate change and socio-economic factors.

## Meat Cutting and Process for Food Service

### *Unit: CH01: Meat Science and Nutrition*

#### Learning Objectives:

- - Describe the composition and characteristics of meat
- - Describe the chemical changes associated with slaughter
- - Describe the aging, blooming, and tenderness factors of meat
- - Describe diseases associated with meat
- - Describe the nutritional value of meat
- - Describe the handling and storage of meat and meat products

### *Unit: CH02: Inspection and Grading of Meats and Poultry*

#### Learning Objectives:

- - Identify meat inspection levels and agencies.
- - Define the meat inspection process.
- - Describe grading regulations for meat.

### *Unit: CH03: Cutting and Processing Meats*

#### Learning Objectives:

- - Describe the muscle and bone structure of meat.
- - Identify suitable cuts of meat for various cooking methods.
- - Identify primal cuts of beef, lamb, pork, and veal.
- - Identify secondary cuts of beef, lamb, pork, and veal.

- - Describe variety meats and offal.
- - Describe cuts of game.

### **Modern Pastry and Plated Dessert Techniques**

#### ***Unit: 04: Dessert Presentation***

Learning Objectives:

- - Describe the principles of plate presentation.
- - Prepare and plan dessert menus.
- - Apply dessert presentation techniques.

#### ***Unit: 02: Plated Desserts***

Learning Objectives:

- - Describe how to design a plated dessert.
- - Learn factors that will contribute to a successful plated dessert.
- - Apply design principles.

#### ***Unit: 03: Dessert Garnishes and Sauces***

Learning Objectives:

- - Describe the effect of garnishes on presentation.
- - Describe the additional effects garnishes can have on a plated dessert.
- - Prepare garnishes from a variety of mediums.
- - Describe the contributing roles of sauces in a plated dessert.
- - Prepare dessert sauces.

#### ***Unit: 01: Scientific Principles and Techniques Used in Modern Pastry***

Learning Objectives:

- - Describe the process of coagulation.
- - Describe the process of gelatinization.
- - Describe the process of crystallization.
- - Describe the use of hydrocolloids.
- - Describe the process of spherification.
- - Describe molecular gastronomy techniques used in the pastry shop.
- - Describe the use of low temperature and sous-vide cooking in the pastry shop.

#### ***Unit: CH05.01 Appendix: Standard recipes for dessert garnishes***

Learning Objectives:

- - Completion

## Soils Laboratory Manual

### *Unit: Soils Laboratory Manual 06: Soil Fertility and Management*

#### Learning Objectives:

- - Learn to interpret information contained in a soil test report
- - Make fertilizer recommendations based on soil test results
- - Become familiar with K-State resources as well as publications available to farmers and gardeners
- - Identify conditions under which soil is most susceptible to erosion by water
- - Utilize the RUSLE equation to estimate the erosion rates of a given hillslope
- - Compare estimated erosion rates to "tolerable" rates of erosion, commonly known as T values
- - Name and describe conservation practices that reduce water and wind erosion
- - Become familiar with the federal, state, and local agencies associated with soil water conservation

### *Unit: Soils Laboratory Manual 01: Introduction and Review*

#### Learning Objectives:

- - Orient students on all safety aspects of the Soils Teaching lab
- - Review the course syllabus and the structure of the Soils Laboratory Manual
- - Review basic chemistry and math skills that will be used throughout the semester

### *Unit: Soils Laboratory Manual 02: Soil Formation, Classification, and Mapping*

#### Learning Objectives:

- - Recognize common rocks and minerals
- - Relate common rocks and minerals compositions to (a) ease of weathering and (b) products of weathering
- - Understand the general geology of Kansas
- - Know the major types of soil parent materials
- - Know the five factors of soil formation
- - Recognize major soil differences as they are affected in soil formation
- - Become familiar with the 12 soil orders
- - Understand the structure of soil Taxonomy
- - Become familiar with the contents of a county soil survey report
- - Use a soil survey report for land use evaluation
- - Explore soils in your local area
- - Demonstrate proficiency in using the SoilWeb web application
- - Become familiar with data available in the SSURGO database



- - Describe a soil profile using a soil profile description sheet
- - Delineate soil profile horizons
- - Interpret a soil profile using the five soil forming factors
- - Identify the impacts of management on soil properties

#### ***Unit: Soils Laboratory Manual 03: Soil Physics***

##### Learning Objectives:

- - Differentiate the three soil separates (sand, silt, and clay) based on their particle size diameters
- - Determine the percentage of sand, silt, and clay in selected soil samples using data collected from the hydrometer method of particle size analysis
- - Estimate the textural class using the texture-by-feel method on selected soil samples
- - Use a textural triangle to determine the textural class of a soil
- - Understand the relationship between particle size and specific surface area
- - Measure soil bulk density and calculate pore volume relationships
- - Understand the effect of texture on pore size and water holding capacity
- - Know relationships among moisture potential, movement, and availability
- - Determine soil water content by weight and volume
- - Measure saturated hydraulic conductivity and understand factors influencing rates of water movement
- - Explain the operation of moisture monitoring devices
- - Become familiar with the driving forces of soil water movement and how soil properties can affect soil water movement
- - Review the key soil water contents and types of water held in soil at different tensions
- - Examine some modern instruments used to measure soil water content and describe how they function
- - Review common calculations for soil water measurements and movement

#### ***Unit: Soils Laboratory Manual 05: Soil Chemistry***

##### Learning Objectives:

- - Measure the effects of different cations on colloidal properties
- - Identify the soil components controlling ion exchange
- - Determine the cation exchange capacity of selected soil horizons
- - Understand the origin of soil acidity
- - Measure soil pH with field and laboratory techniques
- - Determine the role of aluminum in soil acidity
- - State the relationship between cation exchange capacity buffering capacity, and potential acidity
- - Write chemical reactions related to soil pH and liming

- - Know the objectives of liming and the factors affecting lime requirement
- - Measure limestone requirement
- - Determine limestone quality

#### ***Unit: Soils Laboratory Manual 04: Soil Biology***

Learning Objectives:

- - Discuss vermicomposting and review how worm farms are managed
- - Visit the K-State composting operation at the Agronomy North Farm
- - Learn about managing a thermophilic composting operation
- - Discuss how organic waste from the KSU campus is turned into compost
- - Conduct a test for compost maturity
- - Define soil health
- - Describe how soil health indicators are used to track changes in soil health over time
- - Describe how soil health indicators are used to compare two different management practices
- - Explain how soil organic matter influences aggregate stability
- - Perform carbon cycle calculations for a Kansas farm

#### **Understanding Ingredients for Bakers**

##### ***Unit: 01: Grains and Flours***

Learning Objectives:

- - Understand the Importance of Ingredients in Baking
- - Identify and Describe the Key Categories of Baking Ingredients
- - Analyze the Role of Ingredients in the Baking Process

##### ***Unit: 08: Nuts and Seeds***

Learning Objectives:

- - Identify and describe nuts and seeds used in the food service industry
- - Describe the production of nuts, seeds, and nut and seed products
- - Describe the function of nuts, seeds, and nut and seed products in baking

##### ***Unit: 10: Water***

Learning Objectives:

- - Identify and describe the types and properties of water used in the food service industry
- - Describe the function of water in baking

***Unit: 02: Sweeteners in Baking***

Learning Objectives:

- - Identify and describe sugar and other sweeteners used in the food service industry
- - Describe the production of sugar and other sweeteners
- - Describe the function of sweeteners in baking

***Unit: 03: Fats and Oils***

Learning Objectives:

- - Identify and describe fats and oils used in the food service industry
- - Describe the refining and production of fats and oils
- - Describe the function of fats and oils in baking

***Unit: 06: Dairy Products***

Learning Objectives:

- - Identify and describe milk and dairy products used in the food service industry
- - Describe the production of milk and dairy products
- - Describe the function of milk and dairy products in baking

***Unit: 04: Leavening Agents***

Learning Objectives:

- - Identify and describe leavening agents used in the food service industry
- - Describe the production of leavening agents
- - Describe the function of leavening agents in baking

***Unit: 07: Chocolate and Other Cocoa Products***

Learning Objectives:

- - Identify and describe chocolate and cocoa products used in the food service industry
- - Describe the production of chocolate and cocoa products
- - Describe the function of chocolate and cocoa products in baking

***Unit: 13: Fruit***

Learning Objectives:

- - Identify and describe fruits used in the food service industry
- - Describe the production and properties of fruits
- - Describe the function of fruits in baking

***Unit: 05: Eggs***

Learning Objectives:

- - Identify and describe eggs and egg products used in the food service industry
- - Describe the grading of eggs and egg products
- - Describe the function of eggs and egg products in baking

#### ***Unit: 09: Thickening Agents***

Learning Objectives:

- - Identify and describe thickening agents used in the food service industry
- - Describe the production and properties of thickening agents
- - Describe the function of thickening agents in baking

#### ***Unit: 11: Salt***

Learning Objectives:

- - Describe the production and properties of salt
- - Describe the function of salt in baking

#### ***Unit: 12: Spices and Other Flavourings***

Learning Objectives:

- - Describe the basic principles of taste and flavour
- - Identify and describe spices and other flavourings used in the food service industry
- - Describe the production and properties of spices and other flavourings
- - Describe the function of spices and other flavourings in baking

### **Working in the Food Service Industry**

#### ***Unit: CUL07: CH01: Personal Attributes and Professionalism***

Learning Objectives:

- - Describe personal attributes and professionalism in the workplace
- - Describe roles and responsibilities in the workplace

#### ***Unit: CUL07: CH02: Food Service Occupations***

Learning Objectives:

- - Describe food service occupations

#### ***Unit: CUL07: CH05: Organization and Self-Management***

Learning Objectives:

- - Describe stress management techniques
- - Demonstrate the basic principles of organization and time management
- - Describe conflict resolution techniques

- - Describe effective problem solving and decision making

***Unit: CUL07: CH03: Employment Standards for B.C. Food Service Workers***

Learning Objectives:

- - Describe the B.C. Employment Standards Act
- - Describe the B.C. Human Rights Code

***Unit: CUL07: CH04: Workplace Communication and Teamwork***

Learning Objectives:

- - Describe the principles of effective communication
- - Use interpersonal communication skills
- - Work as a part of a team

***Unit: CUL07: CH06: Job Search Skills***

Learning Objectives:

- - Describe effective goal setting
- - Prepare a short and long-term career plan
- - Prepare a resumé

***Workplace Safety in the Foodservice Industry***

***Unit: CUL08: CH10: Emergency Procedures***

Learning Objectives:

- - Understand Emergency Procedures

***Unit: CUL08: CH11: Workplace Safety Procedures***

Learning Objectives:

- - Understand Workplace Safety Procedures

***Unit: CUL08: CH01: Introduction***

Learning Objectives:

- - Describe WorkSafeBC regulations in the workplace
- - Identify and describe workplace hazards
- - Describe basic emergency procedures
- - Describe fire safety procedures and regulations
- - Apply workplace safety procedures

***Unit: CUL08: CH02: WorkSafeBC Regulations in the Workplace***

Learning Objectives:

- - Describe WorkSafeBC regulations in the workplace

***Unit: CUL08: CH04: Roles and Responsibilities***

Learning Objectives:

- - Understand Roles and Responsibilities

***Unit: CUL08: CH03: Orientation and Training for Safety: An Essential Step***

Learning Objectives:

- - Understand Orientation and Training for Safety: An Essential Step

***Unit: CUL08: CH05: Compensation and Benefits***

Learning Objectives:

- - Understand Compensation and Benefits

***Unit: CUL08: CH06: Workplace Hazards***

Learning Objectives:

- - Understand Workplace Hazards

***Unit: CUL08: CH07: Labels***

Learning Objectives:

- - Understand Labels

***Unit: CUL08: CH08: Warning Symbols (WHMIS 1988)***

Learning Objectives:

- - Understand Warning Symbols (WHMIS 1988)

***Unit: CUL08: CH09: Precautions When Using Hazardous Materials***

Learning Objectives:

- - Understand Precautions When Using Hazardous Materials

***Unit: CUL08: CH12: Key Takeaways and Activities***

Learning Objectives:

- - Completion

## Pointful Education

### Agriscience I

#### *Unit: Agriscience\_01 01: Introduction to Agriculture in the Global Economy*

##### Learning Objectives:

- - Evaluate and explain emerging trends and the opportunities they may create within the AFNR systems
- - Assess the economic impact of an AFNR system on a local, state, national and global level
- - Examine historical and current data to identify issues impacting AFNR systems
- - Examine the role of the agricultural industry in the interaction of population, food, energy, and the environment
- - Identify careers in Agriculture in the global economy

#### *Unit: Agriscience\_01 02: Safety, Scientific and Technological Principles of Agriscience Issues*

##### Learning Objectives:

- - Identify the common causes and prevention of accidents in agriscience operations
- - Extract and utilize pertinent information from a container label and/or Safety Data Sheet (SDS) following Environmental Protection Agency (EPA), Worker Protection Standard, and Occupational Safety and Health Agency (OSHA) regulations
- - Describe emergency procedures for basic first aid, CPR, chemical spills, fire extinguisher use
- - Employ scientific measurement skills.
- - Demonstrate safe and effective use of common laboratory equipment
- - Identify the parts and functions of plant and animal cells
- - Describe the phases of cell reproduction
- - Implement the scientific method and science process skills through the design and completion of an agriscience research project
- - Interpret, analyze, and report data
- - Investigate DNA and genetics applications in agriscience including the theory of probability
- - Identify proper disposal of hazardous waste materials and biohazards
- - Evaluate advances in biotechnology that impact agriculture (e.g. transgenic crops, biological controls, etc.)

#### *Unit: Agriscience\_01 03: Environmental Principles in the Agricultural Industry*

##### Learning Objectives:

- - Research how different climactic and geological activity influences agriculture

- - Describe various ecosystems as they relate to the agriculture industry
- - Describe the environmental resources (soil, water, air) necessary for agriculture production
- - Identify regulatory agencies that impact agricultural practices
- - Identify regulatory agencies that impact agricultural practices
- - Identify conservation practices related to natural resources

#### ***Unit: Agriscience\_01 04: Scientific Skills in Plant Science***

##### Learning Objectives:

- - Identify and describe the specializations within the plant science industry
- - Categorize plants based on specific characteristics according to industry and scientific standards
- - Examine the processes of plant growth including photosynthesis, respiration, transpiration, absorption, transfer, storage, reproduction, etc.
- - Identify the nutrients required for plant growth from the periodic table and explain their functions
- - Analyze information from a fertilizer label
- - Propagate and grow plants through sexual and/or asexual reproduction
- - Investigate the impacts of various pests and propose solutions for their control
- - Investigate the nature and properties of food, fiber, and by-products from plants
- - Explore career opportunities in plant science

#### ***Unit: Agriscience\_01 05: Scientific Skills in Animal Science***

##### Learning Objectives:

- - Explain the economic importance of animals and the products obtained from animals
- - Analyze commercially important livestock breeds in Florida
- - Illustrate correct terminologies for animal species and conditions (e.g. age, sex, etc.) within those species
- - Compare and contrast animal welfare issues
- - Investigate the nature and properties of food, fiber, and by-products from animals
- - Explore career opportunities in animal science

#### ***Unit: Agriscience\_01 06: Agriscience Tools, Equipment, and Instruments***

##### Learning Objectives:

- - Select and demonstrate proper use of hand tools in agriculture
- - Operate service and maintain agriscience equipment, and instruments
- - Analyze factors of owning a small farm or agribusiness
- - Examine how communication plays a critical role in leading a small farm or agribusiness



- - Utilize a record-keeping system to collect, interpret, and analyze data
- - Enhance oral communications through telephone, interview, and presentation skills
- - Enhance written communication by developing resumes and business letters
- - Demonstrate interpersonal (nonverbal) communication skills
- - Demonstrate good listening skills

***Unit: Agriscience\_01 07: Leadership and Citizenship Skills***

Learning Objectives:

- - Identify and describe leadership characteristics
- - Identify opportunities to apply acquired leadership skills
- - Identify and demonstrate ways to be an active citizen
- - Participate in community-based learning activities
- - Demonstrate the ability to work cooperatively
- - Conduct formal and informal meetings using correct parliamentary procedure skills
- - Identify the opportunities for leadership development available through the National FFA Organization and/or professional organizations
- - Develop both a leadership and a career development plan utilizing SMART goals that include 5-, 10-, and 20-year benchmarks

***Unit: Agriscience\_01 08: Food Safety and Handling Procedures***

Learning Objectives:

- - Demonstrate proper safety precautions and use of personal protective equipment
- - Evaluate the food safety responsibilities that occur along the food supply chain
- - Explain techniques and procedures for the safe handling of food products
- - Discuss the issues of safety and environmental concerns about foods and food processing (e.g., Genetically Modified Organisms, microorganisms, contamination, and irradiation)
- - Determine appropriate industry response to consumer concerns to assure a safe and wholesome food supply
- - Explore career opportunities in food safety in agriculture

***Unit: Agriscience\_01 00: Start Here***

No Learning Objectives available.

***Unit: Agriscience\_01 09: Course Wrap-up/Final Exam***

No Learning Objectives available.

## Agriscience II

### *Unit: Agriscience\_02 01: The Agriscience Industry, Health and Nutrition*

#### Learning Objectives:

- - Investigate career opportunities in agriscience industries
- - Describe training requirements for entry and advancement in agriscience careers
- - Demonstrate proper methods to clean and disinfect animal equipment and facilities
- - Explain proper disposal of animal waste with regards to sanitation, economics, and environmental implications
- - Describe a livestock animal's digestive system
- - Describe nutritional requirements of animals

### *Unit: Agriscience\_02 02: Livestock Reproduction*

#### Learning Objectives:

- - Examine livestock and poultry reproductive anatomy
- - Explain the reproductive cycles of commercially important animals
- - Compare and select appropriate breeding methods for different agricultural enterprises
- - Describe approved care for newborn animals
- - Identify procedures in animal production: compare & contrast desirable characteristics of breeding and market animals
- - Identify procedures in animal production: evaluate wholesale cuts of beef, pork, lamb, and poultry

### *Unit: Agriscience\_02 03: Livestock Management*

#### Learning Objectives:

- - Describe methods of animal identification
- - Describe methods of restraining, loading, handling, and transporting animals safely
- - Develop procedures for exhibiting animals: demonstrate the procedures for preparing, maintaining, and handling livestock
- - Develop procedures for exhibiting animals: compare and contrast appropriate livestock evaluation criteria
- - Develop procedures for exhibiting animals: prepare appropriate registrations, shipping, and health certificates required for exhibiting or marketing animals
- - Develop procedures for exhibiting animals: demonstrate appropriate grooming and showmanship skills

### *Unit: Agriscience\_02 04: Plant Production Systems Part I*

#### Learning Objectives:

- - Compare different plant production systems (seed, cutting, air layer, and tissue culture)
- - Propagate, transplant, and grow plants
- - Select and prepare a site and/or a seedbed for planting
- - Identify methods of pruning plants to achieve desired growth and to maintain health
- - Identify types of hydroponic systems; identify methods used in hydroponic systems

#### ***Unit: Agriscience\_02 05: Plant Production Systems Part II***

##### Learning Objectives:

- - Interpret information on a fertilizer label
- - Compare sources and forms of nutrients
- - Determine methods of applying fertilizer materials
- - Collect soil samples to determine nutrient levels
- - Test soil for pH and soluble salts

#### ***Unit: Agriscience\_02 06: Agribusiness***

##### Learning Objectives:

- - Use and maintain hand tools and power equipment (e.g., power saws, welders)
- - Describe the maintenance and service of small engines
- - Introduce science principles as applied in selected mechanical applications (e.g. hydraulics, and internal combustion)
- - Apply principles of agribusiness finance: Identify components of balance sheets and income statements
- - Apply principles of agribusiness finance: Identify major sources of credit for agribusiness
- - Apply principles of agribusiness finance: Complete a business loan application
- - Apply principles of agribusiness finance: Maintain and interpret agribusiness financial records including depreciation, inventory, and budgets

#### ***Unit: Agriscience\_02 07: Global Economy Part I***

##### Learning Objectives:

- - Assess the agricultural impact on the US gross national product and the total global economy
- - Investigate local, state, and national regulatory laws, industry regulations, and legislation for agricultural businesses
- - Identify and describe the primary government agencies involved with agriculture
- - Research new and emerging technologies and their impact on agribusiness and the economy

***Unit: Agriscience\_02 08: Global Economy Part II***

Learning Objectives:

- - Describe the value of the food and agribusiness industry
- - Examine the scope of career opportunities in agriculture and the importance of the agriculture industry to the economy
- - Define and explore agriculture and agribusinesses and their role in the economy
- - Evaluate and explore the agribusiness career opportunities in agriculture
- - Compare how key organizational structures and processes affect organizational performance and the quality of products and services

***Unit: Agriscience\_02 00: Start Here***

No Learning Objectives available.

***Unit: Agriscience\_02 09: Course Wrap-up/Final Exam***

No Learning Objectives available.

**Agriscience III*****Unit: Agriscience\_03 01: The Agriscience Industry***

Learning Objectives:

- - Identify and describe the importance of professional and trade organizations
- - Examine and interpret trade journals and academic research in the agriscience industry
- - Describe the five basic ways American business is organized
- - Identify and distinguish between the characteristics of each method of doing business
- - Evaluate the advantages and disadvantages provided by each business method
- - Evaluate how cooperative principles and practices differentiate cooperatives from other businesses: Complete a job application

***Unit: Agriscience\_03 02: Agriculture Cooperatives and Agribusiness Finance***

Learning Objectives:

- - Define a cooperative
- - Explain the history of cooperative principles and practices
- - Describe the five areas that classify cooperative structure
- - Identify and distinguish between the five types of cooperative structure and their functions
- - Explain the purposes and structures of contracts, leases, deeds, and insurance policies
- - Complete a State FFA Degree or Proficiency Applications

- - Identify the tax obligations of agricultural businesses. (ex. Property tax, intangible taxes, income taxes)

#### ***Unit: Agriscience\_03 03: Animal Health and Nutrition***

##### Learning Objectives:

- - Recognize, describe and demonstrate prevention and treatment of common animal diseases, disorders, and pests
- - Read, interpret, and demonstrate correct uses of pesticides, medication, and other additives according to their labels
- - Formulate and compute least-cost feed rations
- - Select and apply growth stimulators and implants
- - Determine feeding rates and methods of feeding animals

#### ***Unit: Agriscience\_03 04: Plant Production Services***

##### Learning Objectives:

- - List the leading local (community) varieties of commonly grown crops for commercial production
- - Recommend varieties of local commercial plants and field crops
- - Identify the recommended planting rate, spacing requirements, and growth times for common garden crops
- - Describe the operation of and adjustment of plant production equipment

#### ***Unit: Agriscience\_03 05: Plant and Crop Fertilization and Irrigation***

##### Learning Objectives:

- - Develop fertilization schedules and calculate fertilizer rates for plants
- - Identify common nutrient-deficiency symptoms in plants
- - Calibrate fertilization equipment and fertilize plants
- - Recognize soil and plant conditions indicating irrigation needs and develop an irrigation schedule
- - Compare and select irrigation equipment and methods

#### ***Unit: Agriscience\_03 06: Plant Pest Control***

##### Learning Objectives:

- - Compare and contrast common plant pests and their damages
- - Diagram life cycles of insects, pests, and diseases
- - Interpret the procedures and requirements for obtaining a restricted-use-pesticide operator's license

- - Select, mix, and apply a no-restricted chemical according to the label and local, state, federal, and EPA regulations
- - Describe biological, chemical, and cultural methods of controlling plant pests
- - Develop Best Management Practices for pest management

***Unit: Agriscience\_03 07: Maintenance of Facilities, Tools, and Equipment***

Learning Objectives:

- - Discuss basic facility maintenance, installation, or repair (e.g., welding, electricity, plumbing, fencing, construction)
- - Safely operate, maintain, service, and repair equipment
- - Install, operate, maintain, and repair irrigation equipment
- - Develop Best Management Practices (BMP) for water use

***Unit: Agriscience\_03 08: Harvesting***

Learning Objectives:

- - Describe procedures for harvesting products (produced by a marketing program)
- - Collect and interpret market reports and identify market outlets for agricultural products (produced by program)
- - Organize a marketing program for an agricultural product (produced by program or student)
- - Assess kinds and types of storage facilities for agricultural products (produced by program)
- - Grade, treat, pack, and/or store harvested products (produced by program)

***Unit: Agriscience\_03 00: Start Here***

No Learning Objectives available.

***Unit: Agriscience\_03 09: Course Wrap-up/Final Exam***

No Learning Objectives available.

## **Architecture & Construction**

### **Almon, Inc.**

#### **Electrical**

***Unit: Basic Electrical 1***

Learning Objectives:

- - Identify basic electrical safety hazards and solutions.

- - Identify proper use of personal protective equipment (PPE) according to NFPA 70E Standards.
- - Explain the basic principles of what electricity is, how it works, and how to measure it.
- - Identify and apply various circuit theorems, including Ohm's Law and the equation to determine power in an electrical circuit.
- - Explain amperage, power, voltage, and resistance.
- - Identify materials as insulators, conductors, and semi-conductors
- - Describe operating characteristics of electrical components including batteries, wires, connectors, grounds, fuses and circuit breakers, switches, resistors, capacitors, diodes, transistors, pressure sensors, temperature sensors, proximity sensors, instruments, and controller and bussers.
- - Install various switching arrangements.
- - Test and troubleshoot completed installation.
- - Describe operating characteristics of electromechanical components including alarms and buzzers, relays, solenoids, transformers, electrical motors, generators, and alternators.

#### ***Unit: Basic Electrical 2***

##### Learning Objectives:

- - Identify characteristics and different kinds of electrical circuits, including machine parked, interlock circuits, start circuits, run circuits, and charging circuits
- - Identify and interpret schematic diagrams
- - Identify and interpret wire harness diagrams

#### ***Unit: Basic Electrical 3***

##### Learning Objectives:

- - Identify characteristics, uses, and connections of meters and measuring devices
- - Understand how to troubleshoot issues

#### ***Unit: Electrical Schematics***

##### Learning Objectives:

- - Understand the fundamental purpose and use of a schematic.
- - Identify electrical schematic symbols.
- - Interpret a basic electrical schematic.

## HVAC and Shop Safety

### *Unit: HVAC - Tractor*

Learning Objectives:

- - Understand the impact of heat and pressure on HVAC systems.
- - Recognize sequential flow in an HVAC system.
- - Identify HVAC components based on their role/function within the system.

### *Unit: Shop Safety*

Learning Objectives:

- - Outline procedures, precautions, and equipment that ensure a safe work environment.
- - Mitigate factors that lead to unsafe environments.

## Tools

### *Unit: Basic Hand Tools*

Learning Objectives:

- - Examine tools to verify they meet safety standards.
- - Select tools based upon the job at hand.
- - Differentiate between tools by the features and functionality.

### *Unit: Precision Measuring Tools*

Learning Objectives:

- - Recognize safety issues involved with precision measuring tools.
- - Identify basic precision measuring tools.
- - Comprehend various types of precision measuring tools.
- - Understand fundamentals of proper use of precision measuring tools.
- - Understand proper care techniques for precision measuring tools.

## Certify ED

### *Carpentry (Video & VR)*

#### *Unit: Carpentry - Fundamentals of Carpentry Safety and Tool Use*

Learning Objectives:

- - Explain the purpose of the Occupational Safety and Health Administration (OSHA) and workplace safety procedures.
- - Explain the safety rules for operating all hand and power tools.
- - Demonstrate the safe transportation, handling, and storing of materials.



- - Demonstrate the inspection, use, and care of personal protective equipment.
- - Identify and describe the use of various hand and power tools.
- - Demonstrate proficiency in the safe use of hand and power tools.
- - Read and use carpenter's measuring tools.
- - Read and use carpenter's layout and marking tools.

#### ***Unit: Carpentry - Fundamentals of Carpentry: Tools, Drawings, and Building Codes***

##### Learning Objectives:

- - Describe how to clean and care for tools and equipment.
- - Recognize and identify basic construction drawing terms, components, and symbols.
- - Recognize different classifications of construction drawings.
- - Interpret and use drawing dimensions and architectural scales.
- - Draw or sketch basic floor plans and/or shop drawings.
- - Relate information on construction drawings to actual locations on the print.
- - Estimate material quantities based on construction drawings.
- - Explain the purpose and importance of the building codes.
- - Identify green building practices and its importance in successful building projects.
- - Establish building and final grade elevations.

#### ***Unit: Carpentry - Lumber Selection and Quality Assessment***

##### Learning Objectives:

- - Identify the grades and species of lumber and their appropriate uses.
- - Identify the actual and nominal sizes of lumber.
- - Identify the grades of plywood and wood products.
- - Identify defects and blemishes that affect the durability and strength of lumber.
- - Explain the effects of temperature extremes, chemical reaction and moisture content on building materials.
- - Install, brace, align, and remove the forms used to form footers and foundations.

#### ***Unit: Carpentry - Foundations and Footings: Engineered Lumber, Concrete, and Construction Techniques***

##### Learning Objectives:

- - Explain the uses of various types of engineered lumber.
- - Identify various types of footing and foundations.
- - Identify the different types and characteristics of concrete used in foundations and footings.
- - Discuss various footings used to support different types of foundation.
- - Describe how a gridline is used to establish footings and foundations.

- - Layout and construct a building foundation.
- - Install, brace, align, and remove the forms used to form footers and foundations.

#### ***Unit: Carpentry - Unit Sim***

Learning Objectives:

- - Understand getting familiar with tools
- - Understand housing foundations

#### ***Unit: Carpentry - Floor Framing and Subfloor Construction***

Learning Objectives:

- - Identify and describe floor-framing members including subfloor.
- - Identify supports for structures, including sills, columns, beams, and girders.
- - Identify various types of joists and openings, including joists for a cantilevered floor.
- - Identify various types of bridging.
- - Identify various types of subfloors, applying fastening techniques.
- - Cut and install framing members for a floor system.
- - Identify framing members used in wall and partition construction.

#### ***Unit: Carpentry - Wall Framing and Insulation***

Learning Objectives:

- - Lay out wall lines and partition locations on a floor.
- - Lay out walls for studs, doors, and windows.
- - Identify studs, trimmers, cripples, headers, and fire stops to length.
- - Identify Ts, corners, and headers.
- - Identify various wall sheathing and/or diagonal bracing systems used in exterior walls.
- - Identify and describe various insulation materials, moisture and air barrier materials and systems.
- - Cut and install framing members for a wall system.

#### ***Unit: Carpentry - Roof Framing and Construction***

Learning Objectives:

- - Identify the different type of roof systems.
- - Identify the roof framing members used in gable and hip roofs.
- - Identify the methods used to calculate the length of a rafter.
- - Identify the various types of trusses used in roof framing.
- - Use a rafter framing square, speed square, and calculator to lay out a roof system.
- - Identify various types of sheathing used in roof construction.
- - Frame a gable roof with vent openings.

- - Frame a roof opening.

#### ***Unit: Carpentry - Roof Framing, Stair Construction, and Material Estimation***

Learning Objectives:

- - Erect a gable roof using trusses.
- - Estimate the materials used in framing and sheathing a roof.
- - Cut framing members for a roof system.
- - Identify the types of stair systems.
- - Identify the parts of a stair system.
- - Calculate the number of treads and risers for a stair system.
- - Lay out, cut, and assemble an exterior and/or interior stair system.

#### ***Unit: Carpentry - Window and Door Installation***

Learning Objectives:

- - Identify various types of fixed, sliding and swinging windows.
- - Identify various materials and techniques used to install a window.
- - Install a pre-hung window in accordance with manufacturer's installation instructions.
- - Identify the common types of doors and explain how they are constructed.
- - Identify various materials and techniques used to install a door.
- - Install a pre-hung door.
- - Identify various materials and techniques used to install cornice and trim.
- - Install cornice and trim.

#### ***Unit: Carpentry - Siding and Cabinetry Installation***

Learning Objectives:

- - Identify various types of siding.
- - Identify various materials and techniques used to install siding.
- - Calculate, lay out, and install siding using a builder's level to establish a level chalk line for the starting course of vinyl siding.
- - Identify various materials and techniques used to installing cabinets.
- - Install cabinets.
- - Install hardware such as hinges, catches, pulls, knobs and guides on assembled cabinets.
- - Install fasteners and drawers.

#### **Construction Safety (OSHA) (Video & VR)**

#### ***Unit: Construction Safety (OSHA) - Unit Sim***

Learning Objectives:

- - Understand health hazards in the construction
- - Understand focus four: hazards in construction
- - Understand personal protective equipment

***Unit: Construction Safety (OSHA) - OSHA: A Foundation for Construction Safety***

Learning Objectives:

- - Explain why OSHA was created and the mission statement of the administration.
- - Demonstrate an understanding of the role of OSHA in job site safety.
- - Describe the basic topics OSHA Standards cover in the construction workplace.
- - Define the responsibilities of the employer to adhere to OSHA regulations.
- - Identify worker rights and responsibilities provided by OSHA.
- - Describe how OSHA inspects workplaces and job sites to ensure standards are being followed.

***Unit: Construction Safety (OSHA) - OSHA Reporting and Enforcement Procedures***

Learning Objectives:

- - Identify ways that employees can report safety hazards.
- - Identify the procedures that OSHA uses to respond to reports of safety hazards.
- - Explain how OSHA protects those that report about a violation of safety on the job site.
- - Identify the types of inspections and describe how each are carried out.
- - Classify who is covered under OSHA and who is not covered under the OSH Act.

***Unit: Construction Safety (OSHA) - Safety Fundamentals: Building a Strong Construction Culture***

Learning Objectives:

- - Demonstrate an understanding of the role that safety plays in the construction industry.
- - Explain the idea of safety culture and its importance in the construction industry.
- - Demonstrate an understanding of the meaning of job site safety.
- - Describe the items that are included in Personal Protective Equipment (PPE) with regard to the safety and health regulations for construction.
- - Demonstrate the use and care of appropriate personal protective equipment (PPE).
- - Exhibit knowledge of how to properly put on and remove personal protective equipment, such as hard hats, safety goggles, face shields, gloves, and hearing protection.
- - Exhibit knowledge of how to properly put on and remove personal protective equipment, such as masks, respirators, and personal fall protection.

### ***Unit: Construction Safety (OSHA) - Personal Protective Equipment (PPE) Requirements in Construction***

Learning Objectives:

- - Identify the specifications for footwear on the job site.
- - Explain the requirements for electrical protective equipment according to OSHA standards.
- - Explain OSHA's requirements for hard hats on the job site.
- - Describe OSHA's standard for when employees must use hearing protection.
- - Identify when eye and face protection should be used according to OSHA protocols.
- - Describe instances in construction when respiratory protection would be required by OSHA.
- - Define and recognize when lifelines, safety belts, and lanyards would be used for safety on the job site.
- - Explain when a safety net would be required on the job site to adhere to OSHA standards.

### ***Unit: Construction Safety (OSHA) - Slip, Trip, and Fall Hazards: Prevention and Mitigation in Construction***

Learning Objectives:

- - Identify and evaluate slips, trips, and falls hazards on the job site.
- - Describe the impact of slips, trips, and falls on the job site.
- - Recognize key slip, trip, and fall terminology.

### ***Unit: Construction Safety (OSHA) - Ladder Safety and Fire Protection in Construction***

Learning Objectives:

- - Identify the standards for a fixed ladder on the job site.
- - Explain the standards for a portable ladder located on the job site.
- - Identify the proper ladder climbing technique described by OSHA standards.
- - Define the importance of a fire protection program.
- - Identify the type and location of equipment that would be present on the job site to fight a fire.

### ***Unit: Construction Safety (OSHA) - Electrical Safety and First Aid in Construction***

Learning Objectives:

- - Explain why improper grounding violates OSHA standards for safety.
- - Identify procedures for lock-out/tag-out.
- - Explain OSHA's safety standards for operating and maintaining all power tools.
- - Define safe work procedures to use around electrical hazards.

- - According to OSHA's standards, identify items that would be located in a first aid kit on a construction job site.
- - Explain the first aid training requirements for job site employees.
- - Identify the signage that is to be used to alert to hazards/dangers on the job site with specification to color and size.

***Unit: Construction Safety (OSHA) - Materials Handling, Hazard Recognition, and Construction Site Safety***

Learning Objectives:

- - Demonstrate knowledge of the importance of proper materials handling.
- - Explain the appropriate safety procedures associated with materials handling.
- - Define hazard recognition and risk assessment techniques.
- - Identify struck-by hazards and demonstrate safe working procedures and requirements.
- - Identify caught-in-between hazards and demonstrate safe working procedures and requirements.
- - Explain hazards caused by environmental elements, welding and cutting, and confined spaces.
- - Explain construction site hazards dealing with work around cranes, loaders, excavation equipment, forklifts, etc.

***Unit: Construction Safety (OSHA) - Tool Safety in Construction: OSHA Standards and Practices***

Learning Objectives:

- - Describe the OSHA standards as they relate to hand tools used on construction job sites.
- - Describe the OSHA standards as they relate to power tools used on construction job sites.
- - Demonstrate the knowledge of basic rigging equipment and safety.
- - Describe the OSHA standards as they relate to motorized and mechanized equipment on construction job sites.
- - Explain the OSHA standards as they relate to abrasive wheels and tools used on construction job sites.

***Unit: Construction Safety (OSHA) - OSHA Standards for Construction Site Tools and Equipment: Woodworking, Jacks, Welding, Excavation, and Masonry***

Learning Objectives:

- - Identify the OSHA standards as they relate to woodworking tools used on construction job sites.

- - Explain the OSHA standards as they relate to jacks and hydraulic equipment used on construction job sites.
- - Describe the OSHA standards as they relate to welding tools and equipment used on construction job sites.
- - Identify the OSHA standards as they relate to excavation tools and equipment used on construction job sites.
- - Identify the OSHA standards as they relate to masonry tools and equipment used on construction job sites.

### Electrical (Video & VR)

#### *Unit: Electrical - Electrical Power Generation and Safety*

##### Learning Objectives:

- - Describe the various ways that electricity is produced.
- - Explain the magnetic properties of circuits and devices.
- - Explain the principles of electromagnetism.
- - Identify the licensure requirements for electrical occupations.
- - Describe the importance of following the local, state, and national electric codes.
- - Read and interpret basic electric codes, plans, and specifications.
- - Read and interpret electrical blueprints and wiring diagrams.

#### *Unit: Electrical - Electrical Safety and Emergency Procedures*

##### Learning Objectives:

- - Explain the National Fire Protection Association (NFPA) 70E and how it relates to job safety for electricians.
- - Explain emergency procedures to follow in response to workplace accidents.
- - Create a disaster and emergency response plan for specific incidences.
- - Identify the procedures for lock-out/tag-out.
- - Explain the importance of CPR (Cardio Pulmonary Resuscitation) and first aid.
- - Discuss the types of protective clothing used by electricians.
- - Discuss the importance of grounding.

#### *Unit: Electrical - Fundamentals of Electrical Circuits*

##### Learning Objectives:

- - Explain the difference between conductors and insulators.
- - Explain the difference between direct current (DC) and alternating current (AC).
- - Explain the difference between single-phase and three-phase systems of AC electrical power.
- - Define and describe voltage, current, resistance, and power.

- - Measure voltage, current, and resistance using industry-standard electrical measuring devices.
- - Explain and apply Ohm's law.
- - Explain and apply Kirchhoff's Laws.
- - Compute conductance and resistance of conductors.

#### ***Unit: Electrical - Fundamentals of Electrical Circuits: Series, Parallel, and Combination Circuits***

Learning Objectives:

- - Explain series circuits.
- - Explain parallel circuits.
- - Explain series parallel combination circuits.
- - Draw a series circuit and calculate the circuit values.
- - Draw a parallel circuit and calculate the circuit values.
- - Draw a series and parallel combination circuit and calculate the circuit values.

#### ***Unit: Electrical - Unit Sim***

Learning Objectives:

- - Install residential switches and outlets

#### ***Unit: Electrical - Electrical Tools, Equipment, Materials, and Testing Techniques***

Learning Objectives:

- - Identify and select the tools, equipment, and materials to complete various electrical projects.
- - Identify the types of bends made in conduit, including 90-degree bends, back-to-back bends, offsets, kicks, and saddle bends.
- - Demonstrate the use of a hand bender to make 90-degree bends, back-to-back bends, offsets, kicks, and saddle bends in conduit.
- - Demonstrate the correct application of fasteners and anchors.
- - Demonstrate the proper use of a multimeter, clamp-on ammeter, and megohmmeter.
- - Demonstrate testing of ground fault circuit interrupters (GFCIs).
- - Demonstrate testing of Arc-Fault Circuit Interrupters (AFCIs).
- - Demonstrate the proper handling and storing of capacitors, motors, transformers, and other electrical equipment.

#### ***Unit: Electrical - Electrical System Sizing and Calculations***

Learning Objectives:

- - Demonstrate the proper sizing of electrical device boxes.
- - Demonstrate the proper sizing of electrical pull boxes.



- - Demonstrate the proper sizing of electrical conduits.
- - Accurately compute loads for various circuits.
- - Identify and calculate voltage/current for primary and secondary windings.
- - Determine KVA capacity of a single-phase and three-phase transformer.
- - Differentiate between Delta and Wye connections.

#### ***Unit: Electrical - Conductor Selection and Installation***

##### Learning Objectives:

- - Identify and explain wire sizes, how they are measured, and how many strands there should be for a given size.
- - Define and determine conductor ampacities and factors to consider when selecting wire material, such as conductivity, cost, availability, and workability.
- - Identify the various types of conductor insulation.
- - Accurately select proper conductors for a specified application.
- - Demonstrate the proper installation of selected conductors in residential applications.

#### ***Unit: Electrical - Electrical Components and Installations***

##### Learning Objectives:

- - Identify the major types of fixed resistors.
- - Identify the resistance of a resistor using the color code.
- - Determine if a resistor is operating within its power rating.
- - Connect a variable resistor for use as a potentiometer.
- - Drill holes in metal, wood, and concrete for electrical installations.
- - Determine the layout of electrical devices, complying with local, state, and national electric code regulations.
- - Install the conductors into conduit, complying with the appropriate local, state, and national electric codes.
- - Install cable, complying with the appropriate local, state, or national electric codes.
- - Install standard outlet boxes, complying with the appropriate local, state, or national electric codes.
- - Install switch boxes, complying with the appropriate local, state, or national electric codes.
- - Install electrical cord connections on equipment, complying with the appropriate local, state, or national electric codes.

#### ***Unit: Electrical - Switches, Receptacles, and Dimmers: Residential Wiring Basics***

##### Learning Objectives:

- - Identify the three main types of switches used for residential applications (single-pole, three-way, and four-way) and describe how they are wired.

- - Identify the types of receptacles used in residential wiring applications.
- - Identify the types of dimmers used in residential wiring applications.
- - Install standard switches on single-pole switched lighting circuits.
- - Install standard duplex receptacles on always-on and single-pole switched lighting circuits.
- - Install GFCI duplex receptacles.
- - Install dimmers on single-pole switched lighting circuits.

#### ***Unit: Electrical - Three-Way and Four-Way Switching Circuits: Installation and Maintenance***

##### Learning Objectives:

- - Install switches on three-way switched lighting circuits.
- - Install receptacles on three-way switched lighting circuits.
- - Install dimmers on three-way switched lighting circuits.
- - Install switches on four-way combination circuits.
- - Install receptacles on four-way combination circuits.
- - Install dimmers on four-way combination circuits.
- - Clean the work area and maintain it in a safe condition.

#### **HVAC 1 (Video & VR)**

##### ***Unit: HVAC 1 - Unit Sim***

##### Learning Objectives:

- - Identify parts of a gas furnace
- - Identify parts of an AC
- - Identify part of a gas boiler

##### ***Unit: HVAC 1 - HVAC Fundamentals: Principles, Systems, and Safety***

##### Learning Objectives:

- - Describe the fundamental concepts of heating, ventilation, air conditioning, and refrigeration.
- - Identify the common types of HVAC-R systems.
- - Describe personal and worksite safety principles to maintain safe and healthy work environments.
- - Identify the various personal protective clothing and equipment used in HVAC and explain their functions.
- - Describe how to use personal protective clothing and equipment used in HVAC.
- - Describe how to care for personal protective clothing and equipment used in HVAC.
- - Identify and explain the common safety procedures when working with heating, air conditioning, and refrigeration systems and equipment.

- - Identify and explain general safety issues and EPA rules and regulations regarding the handling of refrigerants.
- - Describe the purpose of local, state, and federal heating, air-conditioning, and refrigeration codes and standards.
- - Identify and explain safe-handling practices as they relate to hazardous and volatile fluids, compounds, and gases.
- - Identify the basic and specialized tools of the HVAC trade and explain how they are used.
- - Explain the safety precautions to follow when using hand and power tools.
- - Describe appropriate care and maintenance procedures for tools and tool accessories.
- - Explain how to properly use pipe wrenches, torque wrenches, hammers and mallets, tin snips, hand and power hacksaws, drills, and measuring instruments.

#### *Unit: HVAC 1 - HVAC Safety, Regulations, and Mathematics*

##### Learning Objectives:

- - Explain how to follow the manufacturer's installation instructions and why they are important.
- - Explain emergency procedures to follow in response to workplace accidents.
- - Explain the need for employee background checks.
- - Explain the need for medical examinations.
- - Explain the reasons for regular safety meetings and company safety policies.
- - Explain the reasons for disaster and/or emergency response plans, identify what they contain, and describe how they are used.
- - Demonstrate knowledge of arithmetic operations.
- - Demonstrate knowledge and application of measuring.
- - Demonstrate knowledge and application of area and volume calculations.
- - Apply basic math computations to construction settings.
- - Apply basic geometric calculations including the 3-4-5 rule.
- - Explain the mathematical relationship between volume, weight, pressure, vacuum, and temperature related to the HVAC-R trade.
- - Demonstrate knowledge of the math needed to calculate amperage, voltage, wattage, and resistance.
- - Explain how to measure and calculate absolute and gauge pressures.

#### *Unit: HVAC 1 - Electrical Fundamentals for HVAC Professionals*

##### Learning Objectives:

- - Define and explain the relationship between current, voltage, resistance, and power.
- - Explain the difference between DC and AC electricity.

- - Describe the safety practices to prevent electric shock when working with HVACR equipment.
- - Define and explain watts, ohms, volts, and amps.
- - Describe electric motors and heaters as load devices.
- - Describe control devices that control electricity and protect against electrical surges.
- - Describe control devices that use magnetism.
- - Describe electronic controls.
- - Explain what conduit is and how it is used in HVAC.

#### *Unit: HVAC 1 - Electrical Fundamentals for HVAC Systems*

##### Learning Objectives:

- - Identify and explain how electrical measuring tools and devices work.
- - Identify and explain appropriate electrical wiring symbols.
- - Describe the different types of electrical circuit diagrams and explain how to read them.
- - Explain Ohm's Law and Kirchhoff's Law in relation to different types of electrical circuits.
- - Identify the different types of resistors and explain how their resistance values can be determined.
- - Explain single- and three-phase power distribution.
- - Describe the operation of various types of transformers.

#### *Unit: HVAC 1 - Fundamentals of Heat Transfer and Furnace Operation*

##### Learning Objectives:

- - Describe the difference between heat and temperature.
- - Describe matter, heat, and heat transfer.
- - Explain the three methods of heat transfer.
- - Identify the major components of a forced air furnace (gas and electric) and explain their function.
- - Explain the sequence of operation for a gas furnace.
- - Describe the function of furnace air filters and explain the importance of frequent cleaning or replacement.
- - Explain the factors that must be considered when preparing to install a furnace.
- - Explain how to install and adjust a gas valve.

#### *Unit: HVAC 1 - Heat Pumps and Refrigeration Systems*

##### Learning Objectives:

- - Explain the electrical and mechanical operations of a basic heat pump.

- - Identify and explain the following heat-pump systems: air-to-air, air-to-water, water-to-water, ground-to-air (geothermal), open-loop, and closed-loop.
- - Explain how to determine the temperature differential for an outdoor heat exchanger coil.
- - Explain how to determine the temperature differential for an indoor heat exchanger coil.
- - Identify the major components of a cooling system and explain how they operate.
- - Explain the basic refrigeration cycle.
- - Define and explain fluid pressure and temperature.
- - Describe and explain freezing point, critical temperature, and absolute zero.

#### ***Unit: HVAC 1 - Refrigerants and Cooling System Components***

##### Learning Objectives:

- - Identify the refrigerants commonly used in cooling systems and the types of applications in which each is used.
- - Identify and explain the classifications, properties, and uses of different refrigerants based on chemical composition.
- - Explain the proper methods of transferring, storing, and recovering refrigerants.
- - Explain how to evaluate the condition of cooling systems using temperature and pressure measuring instruments.
- - Explain the effects of improper refrigerants and contaminants in a cooling system.
- - Identify various types of compressors and how they function.
- - Identify various types of evaporators and how they function.
- - Identify various types of condensers and how they function.

#### ***Unit: HVAC 1 - Gas Properties, Air Distribution, and Measurement Techniques***

##### Learning Objectives:

- - Explain the physical properties of contained gases and air distribution systems and how they are related within a closed system.
- - Describe the components of an air duct system and explain how they work together to distribute air through a given environment.
- - Identify the instruments used to make measurements in air systems and explain what each instrument is used for: temperature and humidity meters, pressure measurement instruments, air velocity measurement instruments, and instruments for measuring rotational speed.
- - Explain the process of how an HVAC technician uses the appropriate instruments to take measurements for basic temperature and humidity in an air distribution system.
- - Explain the process of how an HVAC technician uses the appropriate instruments to take measurements for air pressure in an air distribution system.

- - Explain the process of how an HVAC technician uses the appropriate instruments to take measurements for air velocity in an air distribution system.
- - Explain the process of how an HVAC technician uses a tachometer to measure the rotational speed of a rotating device, such as a fan, blower, or motor.
- - Describe airflow and pressures in a basic forced-air distribution system.
- - Identify and describe the various types of layouts used in air duct system design, and explain when and where each type is used.

#### *Unit: HVAC 1 - Air Distribution Systems and Components*

##### Learning Objectives:

- - Identify the various fittings and transitions used in air distribution systems and describe their effect on duct system design.
- - Describe how to install the insulation and vapor barriers used in duct systems.
- - Explain the differences between propeller and centrifugal fans and blowers.
- - Explain the installation of metal, fiberboard, and flexible duct.
- - Explain the use and installation of dampers used in duct systems.
- - Identify and explain the operations of electrical control systems and their components.
- - Identify and explain the purpose of the piping, tubing, and fittings used in the heating, air-conditioning, and refrigeration industry.
- - Explain how to correctly prepare and install polyvinyl chloride (PVC) piping.
- - Describe procedures and precautions that must be taken when preparing and installing HVACR piping.

#### *Unit: HVAC 1 - Tubing Fabrication and Joining Techniques*

##### Learning Objectives:

- - Explain how to bend tubing with tube benders.
- - Describe how to connect tubing using flared fittings, pressed fittings, and compression fittings.
- - Describe how to connect tubing using a swaged-joint connection.
- - Explain how to braze and solder copper tubing and fittings in a safe and professional manner.
- - Identify and explain the use of various types of torches used for soldering, brazing, and cutting refrigerant lines.
- - Explain how to select and use appropriate brazing alloys and materials.
- - Explain the purposes and procedures for protecting piping materials and fabrication from the heat.
- - Describe how to silver-braze brass, steel, and copper.

## HVAC 2 - (Video & VR)

### *Unit: HVAC 2 - Unit Sim*

Learning Objectives:

- - Identify part of a gas boiler
- - Identify parts of an AC
- - Identify parts of a gas furnace

### *Unit: HVAC 2 - Safety and Tools in HVAC: Essential Practices for Technicians*

Learning Objectives:

- - Identify the basic first aid skills and procedures as they relate to HVAC service and installation.
- - Identify the causes of jobsite accidents and hazards and describe measures to prevent them from occurring.
- - Demonstrate knowledge of personal protective equipment (PPE) necessary to complete HVAC projects, including identification and usage.
- - Identify the OSHA regulations for safety as they relate to HVAC service and installation.
- - Explain the protocol for handling and reporting accidents in the HVAC trade.
- - Describe the procedures for using fire protection equipment.
- - Explain the four classes of fire extinguishers and how each are used.
- - Demonstrate knowledge of electrical safety procedures in HVAC service and installation.
- - Identify and safely use basic hand tools used in HVAC service and installation.
- - Identify and safely use basic power tools used in HVAC service and installation.

### *Unit: HVAC 2 - Lifting, Ladders, Heat Transfer, and Blueprint Reading*

Learning Objectives:

- - Explain safe lifting techniques.
- - Describe the proper techniques used in ladder safety.
- - Demonstrate an understanding of the modes of heat transfer and BTU (British Thermal Unit).
- - Explain how to use temperature conversion scales.
- - Define the compression ratio and describe how it is used.
- - Explain how to measure in increments and correctly identify fractions.
- - Identify the different types of blueprint plans.
- - Interpret blueprints and electrical diagrams.

### *Unit: HVAC 2 - Electrical Fundamentals and Applications in HVAC Systems*

Learning Objectives:

- - Describe how an alternating current is developed and draw a sine wave.
- - Explain series and parallel circuits.
- - Describe the process of wiring a residential heat pump control circuit.
- - Describe how to perform troubleshooting, service, and repair techniques on various electrical circuits and components.
- - Explain the operation of a single-phase transformer.
- - Describe the process of testing transformers.
- - Identify and describe applications of single-phase motors.
- - Describe how to perform troubleshooting, service, and repair techniques on various motors and motor controls in an HVAC system.

#### *Unit: HVAC 2 - Electrical Components and Troubleshooting in HVAC Systems*

##### Learning Objectives:

- - Describe the types and applications of capacitors.
- - Describe how compressors operate in an HVAC system.
- - Demonstrate the common procedures for service and maintenance of both hermetic and semi-hermetic compressors.
- - Demonstrate how to identify the start, run, and common terminals on a compressor.
- - Explain how magnetism works in various electrical components in an HVAC system.
- - Describe how relays and contactors work.
- - Describe the process of testing relays and contactors for continuity and resistance.
- - Describe the process of testing relays and contactors for input and output voltages.
- - Describe what solenoids are, how they work, and the process of testing them.
- - Identify and explain the types and operation of thermostats.
- - Explain the correct thermostat installation procedures.
- - Describe the process of testing bi-metal thermostats.
- - Identify and explain the low-voltage side of an HVAC system.
- - Describe how to perform troubleshooting, service, and repair techniques on the low-voltage side of an HVAC system.
- - Explain how to determine fuse size and describe how to test fuses in an HVAC system.

#### *Unit: HVAC 2 - Gas and Oil Heating Systems: Components, Maintenance, and Troubleshooting*

##### Learning Objectives:

- - Identify the components of various heating systems.
- - Identify the temperature and pressure measurements of a heating system.
- - Describe the principles of combustion.
- - Explain the process of performing maintenance on a gas furnace.
- - Describe how to perform troubleshooting, service, and repair techniques on conventional and condensing gas heating equipment.



- - Identify equipment related to oil heating.
- - Describe how to install and adjust oil-fired equipment.
- - Explain how to perform annual preventative maintenance on oil-fired equipment.
- - Describe how to perform troubleshooting techniques on oil-fired equipment.
- - Describe how to perform service and repair techniques on oil-fired equipment.

***Unit: HVAC 2 - Electrical Heating and Heat Pumps: Installation, Maintenance, and Troubleshooting***

Learning Objectives:

- - Identify equipment that is related to electric heating units.
- - Discuss the efficiency of electric heat.
- - Describe how to perform troubleshooting, service, and repair techniques on an electric heating system.
- - Explain the modes of operation for a heat pump.
- - Identify and describe heat pump components.
- - Demonstrate how to install heat pumps.
- - Describe how to perform troubleshooting, service, and repair techniques on a heat pump system.

***Unit: HVAC 2 - Refrigeration System Maintenance and Troubleshooting***

Learning Objectives:

- - Identify refrigerants by pressure and temperature relationship and select appropriate refrigerants and oils.
- - Explain how to recover, pressure test, evacuate, and charge an air conditioning system.
- - Test refrigerant components using proper procedures.
- - Describe various refrigeration system types and operations.

***Unit: HVAC 2 - Refrigeration Defrost Systems: Troubleshooting, Maintenance, and Environmental Compliance***

Learning Objectives:

- - Explain how the defrost cycle works for the evaporator coil in air conditioning, refrigeration, and heat pump systems.
- - Describe how to perform troubleshooting, service, and repair techniques on defrost system controls and components.
- - Define and describe the process of recovery, recycling, and reclamation as it applies to refrigerants.
- - Identify and describe the proper handling techniques and disposal process of refrigerants.
- - Explain the EPA legislation and regulation as it pertains to refrigerant recovery.

***Unit: HVAC 2 - HVAC Ductwork Design, Fabrication, and Installation***

Learning Objectives:

- - Identify and describe the different types of duct system components.
- - Describe how to measure temperature, humidity, and air velocities.
- - Explain how to perform basic duct fabrication functions.
- - Describe velocity, static, and total air pressures in a system.
- - Demonstrate the ability to assemble premade sections of ductwork.
- - Explain how to make and install S-cleats, drive cleats, and Pittsburgh seams.
- - Explain how to install flex ducts, take-offs, boots, and registers.
- - Describe what is meant by indoor air quality.
- - Define the function and explain the application of air filters.
- - Identify the types of filters in air distribution systems.

***Unit: HVAC 2 - HVAC System Maintenance and Troubleshooting: Air Quality, Refrigeration, and Load Calculations***

Learning Objectives:

- - Explain the principles and methods for air cleaning and purification.
- - Identify the benefits of proper humidification.
- - Explain the different types of humidifiers.
- - Determine the health factors in dehumidification and humidification.
- - Explain how to properly operate manifold gauges.
- - Describe how to properly operate recovery machines, vacuum pumps, micron gauges, charging scales, and leak detectors.
- - Demonstrate the ability to check the superheat and subcooling measurements.
- - Explain how to perform heat loss calculation of a structure.
- - Explain how to perform heat gain calculation of a structure.

***Plumbing (Video & VR)******Unit: Plumbing - Unit Sim***

Learning Objectives:

- - Solder copper pipes and fittings
- - Layout the plumbing for a typical bathroom

***Unit: Plumbing - Plumbing Career Paths: A Comprehensive Guide***

Learning Objectives:

- - Identify information on current and future job opportunities in the plumbing trade industry and discuss its trends.

- - Describe career ladders for the entry, intermediate, and technical level careers in each of the plumbing trade industry programs and preparation requirements.
- - Describe advanced training opportunities, including apprenticeship programs in each of the plumbing trade industry programs.
- - Discuss the history of plumbing trades.
- - Define the terms used in the plumbing trade industry.
- - Identify pipes, fittings, materials, and equipment related to the plumbing trades.

#### *Unit: Plumbing - Plumbing Tools, Equipment, and Safety*

##### Learning Objectives:

- - Identify and use the basic tools, equipment, and materials of the plumbing trade industry.
- - Demonstrate the procedures and techniques for the selection, use, care, and storage of tools and equipment.
- - Compare the various tools used for plumbing and pipe fitting.
- - Identify tools and equipment and the safety hazards associated with them.
- - Read and interpret measuring devices used in the plumbing industry.
- - Explain the importance of following safety precautions when working in the plumbing trade industry.
- - Describe the personal and jobsite safety rules and regulations that must be followed to maintain safe and healthy work environments.
- - Identify safe working practices and conditions used in the plumbing trade industry.
- - Explain emergency procedures to follow in response to workplace accidents.

#### *Unit: Plumbing - Plumbing Mathematics and Blueprint Interpretation*

##### Learning Objectives:

- - Solve plumbing problems for perimeter and circumference measurements for squares, rectangles, and circles.
- - Solve plumbing problems for area measurements for rectangles and squares, and the surface area of cylinders.
- - Explain pressure measurement in terms of Pounds per Square Inch (PSI), inches of mercury, and Kilopascals (KPA).
- - Solve plumbing problems for volume, weight, and circumference measurements for cylinders.
- - Measure tolerances on horizontal and vertical surfaces using feet and inches, fractions of inches.
- - Calculate piping offsets.
- - Solve plumbing-related basic math problems, such as slope and flow rate.

- - Solve plumbing-related basic math problems, such as head pressure, PSI, and pressure loss.
- - Identify the basic symbols used for plumbing systems in construction drawings.
- - Interpret roof drains, leaders, and drainage systems in construction drawings.

#### ***Unit: Plumbing - Material Takeoffs and Cost Estimation***

Learning Objectives:

- - Interpret material take-off lists and bills of materials.
- - Determine the costs for plumbing materials based on a take-off list.
- - Prepare cost estimates for materials and labor based on a take-off list.

#### ***Unit: Plumbing - Plumbing Fundamentals: Components, Functions, and Installation***

Learning Objectives:

- - Explain the basic theory and principles of plumbing, including the identification of common pipes and fittings.
- - Explain the function of a trap, identify the types of traps used in residential plumbing systems, and describe the factors that go into deciding the proper placement for a trap.
- - Identify pipe joining methods.
- - Identify and describe the functionalities of a toilet.
- - Identify and describe the functionalities of faucets and drains, as found in bathroom and kitchen sinks, bathtubs, and showers.
- - Identify the components and types of fire sprinkler systems and explain how they work.
- - Identify and describe the functionalities of gas fixtures and appliances.

#### ***Unit: Plumbing - Plumbing Components and Installation***

Learning Objectives:

- - Identify the different types of valves by type, size, material, and application.
- - Describe the effect of temperature and pressure changes, chemical reactions, and moisture content on various plumbing systems.
- - Demonstrate an understanding and proper installation of pipes and fittings.
- - Demonstrate an understanding and proper installation of valves.
- - Demonstrate an understanding and proper installation of hangers and supports.
- - Demonstrate an understanding and proper installation of appliances.
- - Demonstrate an understanding and proper installation of fixtures.

#### ***Unit: Plumbing - Installation of Pipes and Fittings for Drain, Waste, Vent (DWV) and Potable Water Systems***

Learning Objectives:

- - Demonstrate the proper installation of plastic pipes and fittings used in Drain, Waste, and Vent (DWV) systems.
- - Demonstrate the proper installation of steel and iron pipes and fittings used in Drain, Waste, and Vent (DWV) systems.
- - Demonstrate the proper installation of copper pipes and fittings used in Drain, Waste, and Vent (DWV) systems.
- - Demonstrate the installation of piping and fittings used in potable water systems.

#### ***Unit: Plumbing - Plumbing Fixture Installation***

##### Learning Objectives:

- - Demonstrate the installation of water meters.
- - Demonstrate the installation of water heating appliances.
- - Demonstrate the installation of kitchen fixtures, including sinks and dishwashers.
- - Demonstrate the installation of bathroom fixtures, including drains, vents, sinks, bathtubs, and faucets.
- - Demonstrate the installation of a toilet.
- - Demonstrate the installation of washers and dryers.
- - Demonstrate the installation of utility fixtures.

#### ***Unit: Plumbing - Plumbing Inspections, Troubleshooting, and Repair Techniques***

##### Learning Objectives:

- - Explain the purpose of and differentiate between the stages of plumbing inspections, including the underground, top-out or rough-in, and final trim stages.
- - Demonstrate how to troubleshoot and diagnose issues in plumbing systems.
- - Demonstrate how to repair washerless faucets.
- - Demonstrate how to repair traditional compression faucets.
- - Demonstrate how to replace fill valves in toilets.
- - Demonstrate how to replace flush valves in toilets.

#### ***Unit: Plumbing - Drain and Fixture Repair: A Practical Guide***

##### Learning Objectives:

- - Demonstrate how to unclog drains and traps.
- - Demonstrate how to repair leaks in traps and faucets.
- - Demonstrate how to repair and replace sink strainers.
- - Demonstrate how to repair fixture water supply pipes.
- - Examine how to follow ethical practices in service and repair.

## Welding (Video & VR)

### *Unit: Welding - Unit Sim*

Learning Objectives:

- - Understand Oxy Acetylene Welding (Oxyfuel Cutting)
- - Understand Shielded Metal Arc Welding
- - Understand Gas Metal Arc Welding
- - Understand Uphill Flux Cored Arc Welding
- - Understand Stainless Steel Gas Tungsten Arc Welding
- - Understand Aluminum Gas Tungsten Arc Welding

### *Unit: Welding - Welding Safety and Hazard Mitigation*

Learning Objectives:

- - Identify various welding hazards and safe practices.
- - Display familiarity with industrial and OSHA safety standards.
- - Demonstrate knowledge of oxyfuel safety procedures.
- - Demonstrate knowledge of arc welding and cutting safety procedures.
- - Demonstrate knowledge of material handling techniques to safely move materials.

### *Unit: Welding - Welding Safety and Industry Practices*

Learning Objectives:

- - Demonstrate proper and safe use of PPE.
- - Demonstrate proper and safe use of hand tools and power equipment.
- - Demonstrate knowledge of clean-up procedures.
- - Demonstrate knowledge of the use of current manufacturing processes as related to the welding industry.
- - Demonstrate an understanding of the importance and impact of routine maintenance of machines and equipment.
- - Explain the processes of separating, forming, conditioning, fabricating, and finishing of materials.

### *Unit: Welding - Metallurgy and Welding Processes: Understanding Metals and Their Preparation*

Learning Objectives:

- - Identify the physical characteristics of metals.
- - Describe and understand the differences between ferrous and nonferrous metals.
- - Describe the differences between casting and forging and explain how alloys are used in these processes.

- - Explain the processes of preheating, post heating, and heat treatment.

#### *Unit: Welding - Welding Metallurgy and Design*

##### Learning Objectives:

- - Describe distortion control methods.
- - Identify basic mechanical properties of metals.
- - Identify and describe common shapes, dimensions, and gauges of metals.
- - Interpret weld and welding symbols.
- - Read and interpret blueprints and sketches.
- - Apply appropriate mathematical practices to the design and creation of drawings using welding symbols.

#### *Unit: Welding - Joint Design, Welding Preparation, and Quality Assurance*

##### Learning Objectives:

- - Identify various joint designs (joint geometry) and welding positions.
- - Clean and prepare materials for groove and fillet welds.
- - Identify welding defects and any discontinuities.
- - Test welds using various destructive techniques.
- - Test welds using various nondestructive techniques.

#### *Unit: Welding - Oxyfuel Cutting: Principles, Equipment, and Applications*

##### Learning Objectives:

- - Use standard measuring and layout tools.
- - Identify oxyfuel cutting principles.
- - Identify and maintain oxyfuel equipment.
- - Handle and store compressed gas cylinders.
- - Cut and form metal with oxyfuel equipment.
- - Perform straight cutting operations using the manual oxyfuel cutting process on plain carbon steel.

#### *Unit: Welding - Arc Cutting Processes: Principles, Equipment, and Consumables*

##### Learning Objectives:

- - Identify arc cutting process principles.
- - Assemble and disassemble arc cutting equipment.
- - Identify and maintain arc cutting equipment.
- - Exhibit an understanding of arc cutting consumables.

***Unit: Welding - Arc Cutting and Stick Welding Techniques***

Learning Objectives:

- - Demonstrate appropriate use of arc cutting equipment.
- - Explain the principles of SMAW.
- - Set up and maintain SMAW equipment.
- - Demonstrate selection and application of SMAW consumables.

***Unit: Welding - Shielded Metal Arc Welding and Gas-Based Welding: Techniques and Applications***

Learning Objectives:

- - Using Shielded Metal Arc Welding, perform fillet and groove welds on a plate in all positions.
- - Make pad welds, in all positions, on plain carbon steel.
- - Explain the principles of GMAW and FCAW.
- - Set up and maintain GMAW and FCAW equipment.
- - Demonstrate identification of GMAW and FCAW consumables.

***Unit: Welding - Gas Metal Arc Welding and Gas Tungsten Arc Welding: Principles and Applications***

Learning Objectives:

- - Using Gas Metal Arc Welding, perform fillet and groove welds on a plate in all positions.
- - Explain the principles of GTAW.
- - Set up and maintain GTAW equipment.
- - Demonstrate selection and application of GTAW consumables.
- - Perform fillet and groove welds on ferrous and nonferrous metals in all positions.

**Core-LX****Plumbing 1*****Unit: Introduction to the Plumbing Industry***

Learning Objectives:

- - a. Describe the history of the plumbing profession.
- - b. Identify the responsibilities of a person working in the plumbing industry.
- - c. State the personal characteristics of a professional.
- - d. Identify the stages of progress within the plumbing profession and its positive impact on society.



- - e. Identify how green technology is incorporated into plumbing.

#### *Unit: Plumbing Tools of the Trade*

Learning Objectives:

- - a. Identify the basic hand and power tools used in the plumbing trade.
- - b. Demonstrate the proper use of plumbing tools.
- - c. Demonstrate the ability to select the proper tool(s) for tasks.
- - d. Demonstrate proper maintenance and storage for hand and power tools.
- - e. Describe the safety requirements for using power and hand tools common to the plumbing trade.

#### *Unit: Introduction to Plumbing Drawings*

Learning Objectives:

- - a. Identify various plumbing drawings and describe how the different views are used.
- - b. Identify the basic symbols used in schematic drawings of pipe assemblies.
- - c. Explain the types of drawings in a complete set of drawings and how they relate to each other.
- - d. Interpret plumbing-related information from a set of drawings.
- - e. Sketch an orthographic and isometric drawing.
- - f. Use an architect's scale to draw lines to scale and to measure lines drawn to scale
- - g. Discuss how code requirements apply to certain drawings.

#### *Unit: Tools of the Trade Checklist*

Learning Objectives:

- - Measuring and Layout Tools .
- - Leveling Tools
- - Tooth-Edged Cutting Tool
- - Smooth-Edged Cutting Tools
- - Manual Pipe Cutters
- - Drilling and Boring Tools
- - Pipe-Threading Machine
- - Wrenches & Pliers
- - Hammers
- - Screw Drivers
- - Vices
- - Calculator
- - Chain Wrenches and Tongs

### ***Unit: Plastic Pipe and Fittings***

Learning Objectives:

- - a. Identify the various types of plastic pipe.
- - b. Identify the material properties, storage, and handling requirements of plastic pipe.
- - c. Identify the types of fittings and valves used with plastic pipe.
- - d. Identify the techniques used in hanging and supporting plastic pipe.
- - e. Properly measure, cut, and join plastic pipe.
- - f. Identify the hazards and safety precautions associated with plastic pipe.

### ***Unit: Plumbing Safety***

Learning Objectives:

- - a. Describe the common unsafe acts and unsafe conditions that cause accidents.
- - b. Describe how to handle unsafe acts and unsafe conditions.
- - c. Explain how the cost of accidents and illnesses affects everyone on site.
- - d. Demonstrate the use and care of appropriate personal protective equipment.
- - e. Identify job-site hazardous work specific to plumbers.
- - f. Explain how to work safely in and around a trench.
- - g. Explain how to work safely in and around confined spaces.
- - h. Demonstrate the proper use of ladders.
- - i. Demonstrate how to maintain power tools safely.
- - j. Describe and demonstrate the lockout/tagout process.
- - k. Identify the benefits of a job safety analysis.

### ***Unit: Introduction to Drain, Waste, and Vent (DWV) Systems***

Learning Objectives:

- - a. Explain how waste moves from a fixture through the drain system to the environment.
- - b. Identify the major components of a drainage system and describe their functions.
- - c. Identify the different types of traps and their components, explain the importance of traps, and identify the ways that traps can lose their seals.
- - d. Identify significant code and health issues, violations, and consequences related to DWV systems.
- - e. Sketch an isometric drawing of a simple DWV system and label its components

### ***Unit: Introduction to Plumbing Math***

Learning Objectives:

- - Completion

***Unit: Copper Tube and Fittings***

Learning Objectives:

- - a. Identify the various types of copper tube.
- - b. Identify the material properties, storage, and handling requirements of copper tube.
- - c. Identify the types of fittings and valves used with copper tube.
- - d. Identify the techniques used in hanging and supporting copper tube.
- - e. Properly measure, cut, and join copper tube.
- - f. Identify the hazards and safety precautions associated with copper tube.

***Unit: P2 06 Installing and Testing Water Supply Piping***

Learning Objectives:

- - Determine the location of fixtures.
- - Identify the size of the pipe to be installed.
- - Determine the route of the water supply piping.
- - Determine the location the water heater, water softener, and hose bibbs.

**Residential Carpentry*****Unit: 03 Hand Tools***

Learning Objectives:

- - Identify and describe the hand tools the carpenter commonly uses.
- - b. Maintain hand tools in suitable working condition.
- - c. Use hand tools in a safe and appropriate manner

***Unit: 04 Hand Power Tools***

Learning Objectives:

- - a. State general safety rules for operating power tools.
- - b. Describe and safely use the following: circular saws, saber saws, reciprocating saws, drills, hammer-drills, screwdrivers, planes, routers, sanders, staplers, nailers, and power-actuated drivers.

***Unit: 05 Stationary Power Tools***

Learning Objectives:

- - a. State general safety rules for operating power tools.
- - b. Describe and adjust a table saw, miter saw, band saw, jointer, drill press, shaper, and bench sander
- - c. Safely operate a table saw, miter saw, band saw, jointer, drill press, shaper, and bench sander.

### ***Unit: 06 Wood and Wood Products***

Learning Objectives:

- - a. Define hardwood and softwood and give examples of some common kinds of species.
- - b. State the grades and sizes of lumber.
- - c. Calculate linear foot and compute square foot and board foot measure.
- - d. Describe the composition, kinds, sizes and several uses of: plywood, oriented strand board, particleboard, hardboard, medium-density fiberboard, and softboard.
- - e. Describe the uses and sizes of: laminated veneer lumber, parallel strand lumber, laminated strand lumber, wood I-beams, and glue-laminated beams.

### ***Unit: 07 Fasteners***

Learning Objectives:

- - Name and describe the following commonly used fasteners and select them for appropriate use: Nails; screws; lag screws; bolts; solid wall anchors; hollow wall anchors; adhesives.

### ***Unit: 01 Job Site Safety***

Learning Objectives:

- - a. Describe the characteristics of jobsite safety.
- - b. Identify personal safety devices used in construction.
- - c. Describe the function of various tools and equipment commonly found on a jobsite.
- - d. Describe the safe use of ladders, ladder jacks, and sawhorses.
- - e. Identify safety concerns with jobsite electricity.
- - f. Identify and describe the safety concerns when using scaffolds.
- - g. Erect and dismantle metal scaffolding in accordance with recommended, safe procedures.
- - h. Follow a recommended procedure to inspect a scaffold for safety.
- - i. Describe the recommended capacities of various parts of a scaffold.
- - j. Construct a scaffold work platform.
- - k. Identify and describe the components of a fall protection system.
- - l. Describe the safety concerns when using mobile metal tubular scaffolds.
- - m. Build safe staging areas using roof brackets.
- - n. Safely set up, use, and dismantle pump jack scaffolding.
- - o. Build a ladder and sawhorse.

### ***Unit: 08 Building Plans and Codes***

Learning Objectives:

- - Demonstrate how specifications are used.
- - Identify various types of lines and read dimensions.
- - Identify and explain the meaning of symbols and abbreviations used on a set of prints.
- - Read and interpret plot, foundation, floor, and framing plans.

#### ***Unit: 09 Building Layout***

Learning Objectives:

- - a. Establish level points across a building area using a water level and a carpenter's hand spirit level in combination with a straightedge.
- - b. Accurately set up and use the builder's level, transit-level, and laser level.
- - c. Use an optical level to determine elevations.
- - e. Build better boards and accurately establish building lines with string.
- - d. Lay out building lines by using the Pythagorean theorem, and check the layout for accuracy.

#### ***Unit: 10 Concrete Form Construction***

Learning Objectives:

- - b. Construct concrete forms for foundation walls.
- - a. Construct forms for footings, slabs, walks, and driveways.
- - h. Estimate quantities of concrete.
- - c. Lay out and build concrete forms for stairs.
- - d. Explain techniques used for the proper placement and curing of concrete.
- - e. Describe the composition of concrete and factors affecting its strength, durability and workability.
- - f. Explain the reasons for making a slump test.
- - g. Explain the reasons for reinforcing concrete and describe the materials used.

#### ***Unit: 11 Floor Framing***

Learning Objectives:

- - a. Describe platform, balloon, and post-and-beam framing, and identify framing members of each.
- - b. Describe several energy and material conservation framing methods.
- - c. Build and install girders, erect columns, and lay out sills
- - d. Lay out and install floor joints.
- - e. Frame openings in floors.
- - f. Lie out, cut, and install bridging.
- - g. Apply subflooring.
- - h. Describe methods to prevent destruction by wood pests

### ***Unit: 12 Wall Framing***

Learning Objectives:

- - a. Identify and describe the function of each part of the wall frame.
- - b. Determine the rough opening width and height for windows and doors.
- - c. Lay out the wall plates for partition, intersections, openings, and OC studs.
- - d. Describe several methods of framing corner and partition intersections.
- - e. Assemble and construct a wall section.
- - f. Erect and temporarily brace a wall section plumb and straight.
- - g. Describe the function of and install blocking and backing.
- - h. Apply wall sheathing.
- - i. Identify and describe the components of nonstructural steel wall framing.
- - j. Install a steel door buck.

### ***Unit: 13 Roof Framing***

Learning Objectives:

- - a. Describe several roof types.
- - b. Define the various roof framing terms.
- - c. Identify the members of gable, gambrel, hip, intersecting, and shed roofs.
- - d. Lay out a common rafter and erect a gable roof.
- - e. Lay out and install gable end studs.
- - f. Lay out a hip rafter and hip jack rafters.
- - g. Lay out a valley rafter and valley rafters.
- - h. Describe and perform the safe and proper procedure to erect a trussed roof.
- - i. Apply roof sheathing.
- - j. Estimate the quantities of materials used in a roof frame.

### ***Unit: 14 Roofing***

Learning Objectives:

- - a. Define roofing terms.
- - d. Estimate needed roofing materials.
- - b. Describe and apply roofing felt underlayment, organic or fiberglass asphalt shingles, and roll roofing.
- - c. Describe and apply flashing to valleys, sidewalls, chimneys, and other roof obstructions.

### ***Unit: 17 Doors***

Learning Objectives:

- - g. Install locksets in doors.

- - e. Describe the standard designs and sizes of doors and name their parts.
- - f. Fit and hang a door to a preexisting opening.
- - a. Describe the most popular styles of windows and name their parts.
- - b. Select and specify desired sized and styles of windows from manufacturers' catalogs
- - c. Install various types of windows in an approved manner.
- - d. Name the parts of and set a pre-hung door frame.
- - h. Install bypass, bi-fold, and pocket doors.

### *Unit: 16 Siding and Decks*

#### Learning Objectives:

- - a. Describe the shapes, sizes, and materials used as siding products.
- - b. Install corner boards and prepare sidewall for siding.
- - c. Apply horizontal and vertical siding.
- - d. Apply plywood and tapped siding.
- - e. Apply wood shingles and shakes to sidewalls.
- - f. Apply vinyl and aluminum siding.
- - g. Describe various types of cornices and name their parts.
- - h. Install gutters and downspouts.

### *Unit: 15 Windows*

#### Learning Objectives:

- - Parts and Types
- - Tools and Materials
- - Installation
- - Install Review for the Construction Manager

### *Unit: 02 Job Site Safety 2 of 2*

#### Learning Objectives:

- - o. Build a ladder and sawhorse.
- - n. Safely set up, use, and dismantle pump jack scaffolding.
- - m. Build safe staging areas using roof brackets.
- - l. Describe the safety concerns when using mobile metal tubular scaffolds.
- - k. Identify and describe the components of a fall protection system.
- - j. Construct a scaffold work platform.
- - i. Describe the recommended capacities of various parts of a scaffold.
- - h. Follow a recommended procedure to inspect a scaffold for safety.
- - g. Erect and dismantle metal scaffolding in accordance with recommended, safe procedures.

- - f. Identify and describe the safety concerns when using scaffolds.
- - e. Identify safety concerns with jobsite electricity.
- - d. Describe the safe use of ladders, ladder jacks, and sawhorses.
- - c. Describe the function of various tools and equipment commonly found on a jobsite.
- - b. Identify personal safety devices used in construction.
- - a. Describe the characteristics of jobsite safety.

## HVACR.EDU

### HVACR Ready to Work (RTW) Program

#### *Unit: 010 Employability Skills*

##### Learning Objectives:

- - Understand Time Management & Priorities
- - Understand Personal Cleanliness
- - Understand Dress for Work
- - Understand Meal Planning
- - Understand Money Management
- - Understand Leave Personal Issues at Home
- - Understand Travel to Work
- - Understand Dependability
- - Understand an overview of industry paperwork and record-keeping
- - Understand residential HVAC
- - Understand commercial HVAC
- - Understand a quote/proposal and acceptance of proposal
- - Understand the bill of materials
- - Understand start up check sheets
- - Understand warranty cards
- - Understand warranty certificates
- - Understand installation instructions
- - Understand the homeowner's information
- - Understand maintenance/service instructions
- - Understand the unit parts list
- - Understand troubleshooting guides
- - Understand bid proposals
- - Understand design build
- - Understand commercial commissioning
- - Understand record-keeping
- - Understand how to make a good first impression.



- - Understand what makes up non-verbal communications
- - Understand several aspects of verbal communications
- - Understand skills to improve their listening
- - Understand what courtesy is
- - Understand the definition of relationships
- - Understand the roles and expectations of work relationships
- - Understand how to conclude the service call on a positive note

#### ***Unit: 050 Applied Math***

Learning Objectives:

- - Understand Addition of Whole Numbers
- - Understand Subtraction of Whole Numbers
- - Understand Multiplication of Whole Numbers
- - Understand Division of Whole Numbers
- - Understand Addition of Common Fractions
- - Understand Subtraction of Common Fractions
- - Understand Multiplication of Common Fractions
- - Understand Division of Common Fractions
- - Understand Addition of Decimal Fractions
- - Understand Subtraction of Decimal Fractions
- - Understand Multiplication of Decimal Fractions
- - Understand Division of Decimal Fractions

#### ***Unit: 106 Building Systems***

Learning Objectives:

- - Learn about the types of residential structures that the HVAC Technician encounters every day in the field
- - Learn about some construction terms used by workers across many trades. Electricians, carpenters, HVAC techs, plumbers and more must be familiar with these terms. Walls, floors, and ceilings must be understood.
- - Understand safety issues and concerns
- - Provide direct guidance on the HVAC system design.
- - Learn when to spot installation issues.
- - Learn when to spot dangerous conditions.

#### ***Unit: 109 Basic Hand and Power Tools***

Learning Objectives:

- - Describe the major hazards from using worn or poorly maintained tools.

- - List some important tips for proper usage of hand tools.
- - Identify basic power tools used in HVACR installations.
- - Understand the proper use of power tools in HVACR installations.
- - Identify electronic tools necessary for HVACR installations.
- - Understand the proper use of electronic tools used in the installation of HVACR equipment.
- - Understand the proper use of tools related to working with sheet metal.
- - Understand the proper use of tools related to working with piping as related to HVACR equipment.

## Open Textbooks

### Basic Blueprint Reading

#### *Unit: Basic Blueprint Reading*

Learning Objectives:

- - Identify and interpret different types of lines used in blueprints
- - Visualize and understand the spatial relationships between components based on blueprints.
- - Create accurate technical sketches of welding details
- - Apply scaling techniques to represent desired size and proportion in blueprints
- - Interpret dimensions precisely and understand their relevance in welding projects.

### Basic Lighting for Electricians: Level 1

#### *Unit: Lighting for Electricians: Level 1 01: Properties of Light and Factors Affecting the Ability to See*

Learning Objectives:

- - Demonstrate an understanding of the properties of light and the factors that affect the ability to see, including the concepts of visible light, the electromagnetic spectrum, wavelength, and the relationship between different regions of the electromagnetic spectrum.
- - Comprehend and analyze the properties of visible light, including its characteristics, color temperature, and spectral distribution, as well as understand the factors that affect the ability to see, such as luminance, contrast, and glare, in order to make informed decisions regarding lighting installations and improve visual comfort and efficiency
- - Evaluate the properties of light, including color rendering index (CRI), its significance in accurately representing colors, and the impact of low-pressure sodium (LPS) lighting on color perception, enabling them to make informed decisions regarding lighting

installations and select appropriate lighting solutions to enhance visual perception and color fidelity.

- - Understand light properties, including chromaticity, color temperature (Kelvin), and light quality, enabling them to make informed decisions for selecting suitable lighting solutions to enhance visual perception and create desired lighting atmospheres.
- - Understand the impact on vision, including the roles of iris, pupil, cornea, lens, retina, rods, and cones, to effectively optimize lighting installations for enhanced visibility and visual comfort.
- - Develop a comprehensive understanding of the fundamental properties of light, including quantity and quality, and their direct impact on visual perception, as measured by lumens and candela, enabling effective lighting design and implementation for optimal visibility and visual comfort.
- - Gain a thorough understanding of the properties of light, including size, brightness, luminance, quality, and quantity, and their direct influence on visual perception and contrast. Explore the temporal aspects of lighting and how it affects human vision, enabling you to make informed decisions in lighting design and implementation for enhanced visibility and visual comfort.

#### ***Unit: Basic Lighting for Electricians: Level 1 02: Common Lighting Units and Measurement***

Learning Objectives:

- - Develop a comprehensive understanding of common lighting units and measurement, including luminous flux, candela, and luminous flux density. Gain proficiency in interpreting and applying these units to accurately quantify and evaluate the intensity, brightness, and distribution of light in various lighting applications.
- - Master the concept and application of the illumination equation in the context of basic lighting principles. Gain the ability to calculate and analyze illumination levels based on the key variables involved, such as luminous flux, distance, and surface area. Develop the skills necessary to determine appropriate lighting levels for different environments and effectively design lighting systems to meet specific requirements.
- - Master the essential concepts of common lighting units and measurements, including luminous flux, lumens, watts, and their practical application in evaluating different lighting sources like incandescent, fluorescent, and LED. Gain proficiency in working with ballasts and drivers to ensure efficient and effective lighting solutions
- - Develop a solid understanding of common lighting units and measurements, including the interpretation and application of letter codes and numerical designations, enabling effective communication and comprehension in lighting specifications and installations.

#### ***Unit: Basic Lighting for Electricians: Level 1 03: Incandescent Lamps***

Learning Objectives:

- - Develop a thorough understanding of incandescent lamps, including their letter code and numerical designation systems, in-rush current characteristics, and factors such as lamp lumen depreciation and luminaire dirt depreciation, to effectively assess, install, and maintain incandescent lighting systems
- - Gain comprehensive knowledge of incandescent lamps, including their construction, working principles, use of quartz, and the regeneration cycle, enabling proficient handling, troubleshooting, and optimization of incandescent lighting systems in various electrical applications.

#### ***Unit: Basic Lighting for Electricians: Level 1 04: LEDS***

##### Learning Objectives:

- - Develop a strong understanding of LEDs, including the principles of semiconductor materials, the functions of the cathode and anode, the role of phosphor coating, and the comparison with fluorescent lighting.
- - Acquire comprehensive knowledge of LEDs, encompassing the operation of LED drivers, the process of rectification, the characteristics and properties of semiconductor materials, and the concept of negative temperature coefficient. Develop the skills necessary to effectively troubleshoot, install, and maintain LED lighting systems, ensuring optimal performance, energy efficiency, and compliance with electrical standards and regulations.
- - Master the principles of LED lighting efficiency by understanding and applying the efficacy equation. Gain proficiency in calculating and evaluating the efficacy of LED lighting systems, enabling informed decision-making regarding energy-efficient lighting solutions. Develop the skills to assess and optimize LED system performance, considering factors such as lumen output, power consumption, and overall energy savings.
- - Gain a comprehensive understanding of LEDs (Light-Emitting Diodes), including their principles of operation, structure, and applications. Develop the knowledge and skills to select, install, and troubleshoot LED lighting systems effectively. Learn about the benefits of LEDs, such as energy efficiency, durability, and versatility, and explore their role in modern lighting design and technology.

#### ***Unit: Basic Lighting for Electricians: Level 1 05: Energy Savings Examples***

##### Learning Objectives:

- - Understand the concept of "How long to pay for itself?" in relation to lighting systems, comparing the electrical costs of incandescent and LED lighting technologies. Learn how to calculate and analyze the energy consumption and associated costs of each lighting option over time.
- - Develop the skills to evaluate the financial benefits and return on investment (ROI) of transitioning from incandescent to LED lighting. Gain insights into the long-term cost

savings, energy efficiency, and maintenance advantages offered by LED technology, enabling informed decision-making for lighting upgrades and installations.

***Unit: Basic Lighting for Electricians: Level 1 06: Edison Screw Bases***

Learning Objectives:

- - Understand the principles of Edison Screw Bases in lighting systems, including the concepts of ungrounded conductor, grounded conductor, and identified conductor. Gain the knowledge and skills to correctly identify and differentiate these components in electrical installations, ensuring safe and compliant wiring practices in relation to Edison Screw Bases.
- - Develop a comprehensive understanding of Edison Screw Bases used in lighting fixtures, including their design, components, and applications. Gain the knowledge and skills to identify, select, and install Edison Screw Bases correctly, ensuring efficient and safe electrical connections in lighting systems.

***Unit: Basic Lighting for Electricians: Level 1 07: Common Switches***

Learning Objectives:

- - Gain a solid understanding of common switches used in electrical installations, including their types, functions, and wiring principles. Develop the ability to identify, select, and properly install ungrounded switches in various lighting circuits, ensuring effective control and safe operation of electrical systems.
- - Develop a comprehensive understanding of common switches utilized in electrical systems, with a particular focus on their role in establishing electrical connections. Acquire the knowledge and skills necessary to effectively install, operate, and troubleshoot switch connections in lighting circuits, ensuring proper functionality and adherence to electrical safety standards.
- - Develop a deep understanding of the principles behind 4-way switch wiring, enabling you to effectively control lighting fixtures from multiple locations. Acquire the necessary skills to troubleshoot and maintain 4-way switch setups, ensuring optimal performance and compliance with electrical safety regulations
- - Develop a comprehensive understanding of common switches used in lighting circuits, including SPST (Single-Pole, Single-Throw) and DPST (Double-Pole, Single-Throw) switches.
- - Master the fundamental concepts of common switches used in lighting circuits, with a specific focus on understanding their relationship to overcurrent protection. Gain expertise in selecting and installing switches that comply with electrical codes and regulations regarding overcurrent protection. Acquire the skills to identify and troubleshoot overcurrent issues in lighting systems, ensuring safe and efficient operation.

- - Develop a comprehensive understanding of dimmer switches commonly used in lighting applications, including their functionality, installation, and control. Gain expertise in selecting and configuring dimmer switches to achieve desired lighting effects, optimize energy efficiency, and enhance user comfort. Acquire the skills to troubleshoot common issues related to dimmer switches, ensuring proper operation and compatibility with various types of lighting fixtures.

#### ***Unit: Basic Lighting for Electricians: Level 1 08: Common Switching Circuits***

##### Learning Objectives:

- - Develop proficiency in interpreting and applying schematic and wiring diagrams for common switching circuits in lighting systems, enabling effective troubleshooting, circuit design, and accurate installation and maintenance.
- - Gain a comprehensive understanding of common switching circuits, including SPST configurations, and the proper identification and utilization of ungrounded and grounded conductors, ensuring safe and effective operation of lighting systems.
- - Develop proficiency in the application of dead-end switch wiring technique within common switching circuits, ensuring efficient utilization of wiring resources while maintaining electrical safety standards in lighting installations.
- - Master the knowledge and skills necessary to effectively understand, select, and install different types of switches used in common switching circuits, ensuring proper functionality and safety in lighting systems.

#### **Building Maintenance & Construction: Tools and Maintenance Tasks**

##### ***Unit: CON 01: BM&C: Tools and Maintenance Tasks 00: Introduction***

##### Learning Objectives:

- - Completion

##### ***Unit: CON 01: BM&C: Tools and Maintenance Tasks 01: Safety***

##### Learning Objectives:

- - Describe and demonstrate safe use of common hand and power tools used to perform common maintenance and construction tasks

##### ***Unit: CON 01: BM&C: Tools and Maintenance Tasks 02: Hand & Power Tools***

##### Learning Objectives:

- - Identify and perform basic preventive and reactive maintenance procedures for residential homes, apartments, and appliances.

***Unit: CON 01: BM&C: Tools and Maintenance Tasks 03: Mathematics for Maintenance Techs***

Learning Objectives:

- - Apply quantitative methods to common building maintenance tasks

***Unit: CON 01: BM&C: Tools and Maintenance Tasks 04: Plumbing Systems***

Learning Objectives:

- - Describe procedures for research, requisition, and procurement of materials and parts to complete construction and maintenance tasks and/or work orders.

***Unit: CON 01: BM&C: Tools and Maintenance Tasks 05: Electrical Systems***

Learning Objectives:

- - Describe procedures for research, requisition, and procurement of materials and parts to complete construction and maintenance tasks and/or work orders.

***Unit: CON 01: BM&C: Tools and Maintenance Tasks 06: Maintenance Management Systems***

Learning Objectives:

- - Identify and perform basic preventive and reactive maintenance procedures for residential homes, apartments, and appliances

**Fundamentals of Building Construction Management*****Unit: CON 02 Fundamentals of Building Construction Management 01: Introduction to the Building Industry***

Learning Objectives:

- - Describe the characteristics of the AEC Industry
- - Understand the variety of projects performed within the industry
- - Describe the scope and scale of the industry

***Unit: CON 02 Fundamentals of Building Construction Management 02: The Lifecycle of a Building Project***

Learning Objectives:

- - Define the four primary phases of the lifecycle of a building project
- - Describe various unique aspects of a building project in relation to the manufacturing industry
- - Define the total cost of ownership, and the impact of decision timing on overall lifecycle cost

***Unit: CON 02 Fundamentals of Building Construction Management 03: Project Participants and Roles***

Learning Objectives:

- - Define the types of companies and organizations that exist in the Construction Industry
- - Identify typical tasks and activities performed by the different types of organizations

***Unit: CON 02 Fundamentals of Building Construction Management 04: Project Delivery Methods***

Learning Objectives:

- - Understand the different aspects included in typical project delivery methods
- - Define the impact of various organizational structures on delivering a project
- - Describe the different payment methods for contractors on a project
- - Explain the types of award methods for selecting team members
- - Draw an organizational chart for multiple types of organizational structures
- - Describe the meaning of 'partnering' and 'fast-tracking'

***Unit: CON 02 Fundamentals of Building Construction Management 05: Introduction to Construction Cost Estimating***

Learning Objectives:

- - Define typical cost estimating methods that are used within the Construction Industry
- - Describe the types of cost information available to various participants within the industry
- - Describe relative levels of accuracy for different estimating approaches

***Unit: CON 02 Fundamentals of Building Construction Management 06: Rough Order of Magnitude (ROM) Cost Estimating***

Learning Objectives:

- - Understand the benefits and limitations of the ROM estimating approach
- - Develop a Rough Order of Magnitude estimate for a building project
- - Perform cost estimate translations considering time factors and location factors
- - Identify the appropriate locations to find the R.S. Means cost data tables used for ROM estimates

***Unit: CON 02 Fundamentals of Building Construction Management 07: Modeled Square Foot (SF) Cost Estimating***

Learning Objectives:



- - Describe the benefits and limitations of the Modeled Square Foot (SF) estimating approach
- - Develop a Modeled Square Foot estimate for a building project
- - Identify the appropriate locations to find the R.S. Means cost data tables used for Modeled Square Foot estimates

***Unit: CON 02 Fundamentals of Building Construction Management 08: Assemblies Cost Estimating***

Learning Objectives:

- - Describe the benefits and limitations of the assemblies estimating approach
- - Develop an assemblies estimate for a building project
- - Calculate the approximate cost differentials for selecting various system options for a project

***Unit: CON 02 Fundamentals of Building Construction Management 09: Unit Price Cost Estimating***

Learning Objectives:

- - Describe the benefits and limitations of the unit cost estimating approach
- - Develop a unit cost estimate for a portion of a building project
- - Identify the detailed cost components within a unit price estimate, and how these cost elements are calculated

***Unit: CON 02 Fundamentals of Building Construction Management 10: Procurement and Purchasing***

Learning Objectives:

- - Describe how various trade contractor scopes of work are procured (purchased) on a construction project
- - Understand the concepts of 'scope bust' and 'bid shopping'

***Unit: CON 02 Fundamentals of Building Construction Management 11: Value Engineering***

Learning Objectives:

- - Define Value Engineering in the context of delivering a construction project.
- - Understand the core characteristics of a valuable VE element.

***Unit: CON 02 Fundamentals of Building Construction Management 12: General Conditions and Project Staffing***

Learning Objectives:

- - Define the elements contained within general conditions for a project.

- - Understand the typical organizational structure and job tasks of different participants on a project.
- - Be able to define and draw a typical organizational structure for a construction firm, and understand how it differs from typical manufacturing or service organizations.

***Unit: CON 02 Fundamentals of Building Construction Management 13: Designing a Site Utilization Plan***

Learning Objectives:

- - Define the items needed in a site utilization plan.
- - Understand the core concepts for designing the site utilization plan for various stages of a project.
- - Be able to define and draw a site utilization plan for a project.

***Unit: CON 02 Fundamentals of Building Construction Management 14: Introduction to Project Scheduling***

Learning Objectives:

- - Define the different types of schedules that may be developed for managing the activities and phases of a project
- - Understand the purpose of various schedule types and presentation approaches
- - Understand the complexity and planning effort required to develop different types of schedules

***Unit: CON 02 Fundamentals of Building Construction Management 15: Network Scheduling***

Learning Objectives:

- - Define the various terms used in the development of network schedules, e.g., critical path, total float, and free float.
- - Develop a network diagram of a schedule and calculate the start/finish times and float values.
- - Identify the critical path activities within a network diagram which includes float time values.

***Unit: CON 02 Fundamentals of Building Construction Management 16: Risk and Contract Management***

Learning Objectives:

- - Understand the concept and core definitions related to risk management approaches for building construction projects.
- - Identify the different types of risk management instruments used to manage project risks.

- - Define the main types of insurance and bonds that owners, designers, and constructors may use on a project, along with understanding the frequency of use.

***Unit: CON 02 Fundamentals of Building Construction Management 17: Introduction to Project Management and Control***

Learning Objectives:

- - Describe the many aspects of a project that need to be managed to ensure a successful construction project
- - Define four management areas that are frequently referenced as the Golden Triangle, which require close management of constraints and expectations

***Unit: CON 02 Fundamentals of Building Construction Management 18: Schedule Management***

No Learning Objectives available.

***Unit: CON 02 Fundamentals of Building Construction Management 19: Cost and Financial Management***

Learning Objectives:

- - Describe the core concepts required to effectively manage the costs and finances on a project
- - Describe the evolution of a construction cost estimate into a cost budget.
- - Draw and analyze a cash flow diagram, and understand the impact of the timing of income and expenses on a project.
- - Calculate the anticipated monthly payments for a project given expenditure, a project schedule, and contractual terms related to payments.

***Unit: CON 02 Fundamentals of Building Construction Management 20: Quality Management***

Learning Objectives:

- - Understand the elements of a quality management program
- - Define quality planning, quality assurance and quality control.
- - Determine core components of the various quality management program items.

***Unit: CON 02 Fundamentals of Building Construction Management 21: Safety Management***

Learning Objectives:

- - Understand that safety can never be compromised for other aspects of a construction project
- - Be able to define the importance of safety from an ethical and an economic perspective
- - Define effective safety management approaches to improve overall safety on construction projects
- - Be able to identify OSHA safety guideline locations and general reporting requirements

- - Understand the impact of construction accidents on projects

***Unit: CON 02 Fundamentals of Building Construction Management 22: Information Management***

Learning Objectives:

- - Describe the various sources of information that are shared between project participants
- - Describe the information management process
- - Define the role of information management throughout the project lifecycle
- - Understand the importance of contractual and non-contractual information

***Unit: CON 02 Fundamentals of Building Construction Management 23: Introduction to Lean Construction***

Learning Objectives:

- - Define 'lean construction'
- - Understand the types of waste on construction projects
- - Be able to list various methods used on projects to increase value and reduce waste
- - Describe the Last Planner System™
- - Understand the process to develop a Lean Deployment Plan for a project

***Unit: CON 02 Fundamentals of Building Construction Management 24: The Future of the Construction Industry***

Learning Objectives:

- - Understand the trends that are impacting the future of the construction industry
- - Describe the characteristics that need to change to advance the construction industry
- - Assess your role in advancing the industry and your future knowledge and skills

***Unit: CON 02 Fundamentals of Building Construction Management: Reference Materials***

Learning Objectives:

- - Completion

**Introduction to Architecture**

***Unit: Introduction to Architecture***

Learning Objectives:

- - Define the different types of function and apply them to architectural examples
- - Evaluate structures in their own community based on the Vitruvian Triad

- - Compare and contrast the different architectural structures presented here based on their functional and formal qualities
- - Evaluate the importance of the built environment and its impact on the surrounding landscape and people
- - Use an example of Anne Tying's work to describe her use of geometric forms
- - Describe what it means to inhabit geometry
- - Consider how light is use to express architectural form
- - Compare and contrast Louis Kahn and Anne Tying's careers in the architecture field
- - Identify and define the key visual elements of architecture
- - Discuss Julian Abele's contributions to American architecture
- - Examine Abele's work in the context of the racial discrimination he faced as an African-American architect
- - Apply the visual elements of architectures to their own experience of the built environment
- - Identify and define different types of architectural space
- - Describe and Deconstructivist architectural style and apply it to Zaha Hadid's work
- - Compare and contrast Hadid's work with Daniel Libeskind's, discussed in the Defining Architecture chapter of this text
- - Define incremental housing
- - Explain the process of participatory design
- - Use specific examples from the material presented in this lesson to evaluate the four areas of support needed to implement incremental housing
- - Argue for or against offering architectural plans for free
- - Evaluate the role architects can play in colving real-world problems through design
- - Define LEED and the Living Building Challenge
- - Describe key features of green architectural design
- - Compare and contrast the strategies of LEED and the Living Building Challenge

## Pointful Education

### Architectural Design I

#### *Unit: Architecture\_01 Arch 15: Course Wrap-up/Final Exam*

Learning Objectives:

- - Completion

#### *Unit: Architecture\_01 Arch 00: Principles of Architecture Module 0*

Learning Objectives:

- - Completion

***Unit: Architecture\_01 Arch 01: Basic Drafting***

## Learning Objectives:

- - Use and maintain drafting equipment, measuring scales, drafting instruments, and reproduction equipment.
- - Identify and use the various drafting media and techniques and demonstrate the use of the alphabet of lines.
- - Prepare title blocks and other drafting formats and use various freehand and other lettering techniques.
- - Develop skill in sketching and mark making to plan, execute and construct two-dimensional images or three-dimensional models, including presentation graphics.
- - Apply geometric construction techniques and solve geometric, algebraic, and trigonometric problems related to drafting.
- - Demonstrate care of equipment and apply use of effective and accurate architectural and/or engineering vocabulary throughout design and drafting process.

***Unit: Architecture\_01 Arch 02: Design and Drawings Part I***

## Learning Objectives:

- - Analyze challenges and identify solutions for design problems.
- - Investigate the use of space, scale and environmental features to create three-dimensional form, or the illusion of depth and form.
- - Analyze and apply data and measurements to solve problems and interpret drawings.
- - Prepare multi-view scaled drawings.
- - Select proper drawing scale, views and layout.

***Unit: Architecture\_01 Arch 03: Design and Drawings Part II***

## Learning Objectives:

- - Prepare drawings containing horizontal and vertical surfaces.
- - Prepare drawings containing circles and/or arcs.
- - Prepare removed details and conventional breaks.
- - Prepare drawings containing full sections and half sections.
- - Prepare drawings containing offset sections.

***Unit: Architecture\_01 Arch 04: Design and Drawings Part III***

## Learning Objectives:

- - Prepare drawings containing revolved sections.
- - Prepare drawings containing removed sections and broken-out sections.
- - Prepare a sectional assembly drawing applying material symbols.
- - Prepare drawings containing primary auxiliary views.

- - Prepare drawings containing auxiliary views that include curved lines.

#### *Unit: Architecture\_01 Arch 05: Dimensioning and Annotation*

Learning Objectives:

- - Prepare drawings containing linear, angular and circular standard dimensions.
- - Prepare drawings using general and local notes.
- - Apply basic tolerance techniques and nominal and actual dimensions.

#### *Unit: Architecture\_01 Arch 06: Working Drawings*

Learning Objectives:

- - Prepare assembly drawings.
- - Prepare detail drawings.
- - Prepare technical drawings.
- - Modify drawings to include material specifications and parts list.

#### *Unit: Architecture\_01 Arch 07: Pictorial Drawings and Surface Developments*

Learning Objectives:

- - Prepare pictorial drawings using 2D sketching and/or CAD software
- - Prepare isometric, oblique and other pictorial drawings.
- - Prepare one-point and two-point perspectives.
- - Prepare presentation graphics.
- - Prepare developments of prisms, cylinders, cones and pyramids.

#### *Unit: Architecture\_01 Arch 08: Sequential Processes Part I*

Learning Objectives:

- - Demonstrate organizational skills to influence the sequential process when creating drawings.
- - Construct geometric figures of lines, splines, circles, arcs, etc., to represent plans and/or mechanical assemblies.
- - Create and edit text using appropriate style and size to annotate drawings.
- - Create and use multi-leaders.
- - Use control accuracy enhancement tools for entity positioning methods such as snap and XYZ.
- - Use editing commands.
- - Use viewing commands to perform zooming and panning.

#### *Unit: Architecture\_01 Arch 09: Sequential Processes Part II*

Learning Objectives:

- - Plot drawings on media using layout and scale.
- - Use query commands to interrogate database for entity characteristics, distance, area, and status.
- - Apply standard dimensioning rules.
- - Move, stretch and offset objects.
- - Create a radius between objects.
- - Trim and extend objects.
- - Break and join objects.

#### *Unit: Architecture\_01 Arch 10: Sequential Processes Part III*

Learning Objectives:

- - Create and edit dimensions and work with dimension styles.
- - Change object properties.
- - Crosshatch objects.
- - Apply external references.
- - Isolate and hide objects.
- - Use selection set methods.

#### *Unit: Architecture\_01 Arch 11: Sequential Processes Part IV*

Learning Objectives:

- - Use rectangular and polar arrays.
- - Use rotation reference angles.
- - Use elements of creativity and organizational principles to create visually coherent views and layouts.
- - Create and manage layers or levels.
- - Use page setup for plotting.

#### *Unit: Architecture\_01 Arch 12: Sequential Processes Part V*

Learning Objectives:

- - Create, insert and edit reusable content such as symbols and blocks or cells.
- - Use specific line types.
- - Create fills and gradients.
- - Edit hatch patterns and fills.

#### *Unit: Architecture\_01 Arch 13: Three-Dimensional Drawing Part I*

Learning Objectives:

- - Use coordinate systems to locate objects in three dimensional space



- - Use basic geometric shapes available in two-dimensional and three-dimensional modeling software.
- - Define the parameters used for determining size, placement, and orientation of a modeling object.
- - Describe the Boolean modeling operations of union, subtraction, and intersection.
- - Demonstrate extrusion or sweeping techniques that transform two-dimensional objects into three-dimensional objects.
- - Describe the 'revolve' or 'lathe' techniques for animating a two-dimensional object and give examples of their application.
- - Use scale, rotate, and move actions that comprise the transformation technique for animating a three-dimensional object.

#### *Unit: Architecture\_01 Arch 14: Three-Dimensional Drawing Part II*

Learning Objectives:

- - Use basic viewing navigation tools such as zoom, rotate and panning.
- - Work with materials, techniques, and processes through practice and perseverance to create desired result in two-dimensional and three-dimensional models.
- - Analyze challenges and identify solutions for three-dimensional design problems.
- - Investigate the use of space, scale, and environmental features within a model to create three-dimensional form or the illusion of depth and form.
- - Apply materials, ideas, images, and/or equipment from other content areas to generate ideas and processes for the development of three-dimensional models.

#### **Architectural Design II**

##### *Unit: Architecture\_02 01: Basic Architectural Drawings*

Learning Objectives:

- - Solve design problems, through convergent and divergent thinking, to gain new perspectives.
- - Apply critical thinking and problem-solving skills to develop creative solutions for design problems.
- - Draw a site plan and a floor plan.
- - Draw interior and exterior elevations.
- - Draw roof plan, wall sections, and a plot plan.

##### *Unit: Architecture\_02 02: Basic Architectural Drawings Part II*

Learning Objectives:

- - Prepare door/ window schedules.
- - Draw electrical plan.

- - Review and revise plans throughout the design process to refine and achieve design objective.
- - Demonstrate flexibility and adaptability throughout the design process.
- - Define a basic project materials list.
- - Calculate a basic project quantity take-off.

#### *Unit: Architecture\_02 03: Basic Computer-Aided Drafting Functions Part I*

Learning Objectives:

- - Demonstrate organizational skills to influence the sequential process when creating drawings.
- - Construct geometric figures of lines, splines, circles and arcs.
- - Create and edit text using appropriate style and size to annotate drawings.
- - Use control accuracy enhancement tools for entity positioning methods such as snap and XYZ.
- - Use editing commands as well as viewing commands to perform zooming and panning.

#### *Unit: Architecture\_02 04: Basic Computer-Aided Drafting Functions Part I I*

Learning Objectives:

- - Plot drawings on media using layout and scale.
- - Use query commands to interrogate database for entity characteristics, distance, area, and status.
- - Apply standard dimensioning rules.
- - Demonstrate an ability to move, stretch and offset objects; create a radius between objects; trim and extend objects; break and join objects, create and edit dimensions; and change object properties.

#### *Unit: Architecture\_02 05: Basic Civil Drawings*

Learning Objectives:

- - Apply use of effective and accurate civil terminology throughout the design process.
- - Read and interpret civil drawings.
- - Draw plan and profile drawings.
- - Develop topographic drawings.

#### *Unit: Architecture\_02 06: Preparing Computer-Aided Drawings (CAD) Part I*

Learning Objectives:

- - Demonstrate the ability to draw a floor plan, draw a site plan, draw exterior and interior elevations and draw a roof plan.
- - Prepare door and window schedules.

- - Demonstrate the ability to draw a wall section, draw an overall site plan, draw a building plot plan, and draw an electrical plan.

***Unit: Architecture\_02 00 - Start Here***

Learning Objectives:

- - Completion

***Unit: Architecture\_02 07: Preparing Computer-Aided Drawings (CAD) Part II***

Learning Objectives:

- - Research the history of the built environment.
- - Describe the significance of major architects, engineers or inventors to understand their historical influences.
- - Research innovative historical architectural and/or engineering works and examine the significance of their legacy for the future.
- - Identify transitions in design media, technique and focus to explain how technology has changed design throughout history.

***Unit: Architecture\_02 08: Preparing for the Autodesk Certified User (CAD) Exam***

Learning Objectives:

- - Understand the requirements for the Autodesk Certified User (CAD) Certification.
- - Understand the structure of the CAD exam.
- - Demonstrate readiness for the CAD exam.
- - Explore the job opportunities for an Autodesk Certified Users.

***Unit: Architecture\_02 09: Course Wrap-up/Final Exam***

Learning Objectives:

- - Completion

**Architectural Design III**

***Unit: Architecture\_03 01: Computer-Aided Drafting Functions Part I***

Learning Objectives:

- - Draw lines, arcs, circles, etc. to represent plans and/or mechanical assemblies.
- - Create text styles, text justification and multi-line text.
- - Create and use multi-leaders.
- - Edit dimensions.
- - Work with dimension styles.

***Unit: Architecture\_03 04: Professional Ethics and Legal Responsibilities***

Learning Objectives:

- - Evaluate and justify decisions based on ethical reasoning.
- - Evaluate alternative responses to workplace situations based on personal, professional, ethical, legal responsibilities and employer policies.
- - Identify and explain personal and long-term consequences of unethical or illegal behaviors in the workplace.
- - Interpret and explain written organizational policies and procedures.
- - Demonstrate personal responsibility, ethics and integrity, including respect for intellectual property, when accessing information and creating design projects.

***Unit: Architecture\_03 02: Computer-Aided Drafting Functions Part II***

Learning Objectives:

- - Crosshatch objects.
- - Apply external reference; isolate and hide objects.
- - Use selection set methods.
- - Use rectangular and polar arrays.
- - Use rotation reference angles.
- - Use elements of creativity and organizational principles to create visually coherent viewports and layouts.

***Unit: Architecture\_03 03: Computer-Aided Drafting Functions Part III***

Learning Objectives:

- - Create and manage layers.
- - Use page setup for plotting.
- - Create, insert, and edit reusable content such as symbols and blocks.
- - Use specific line types.
- - Create fills and gradients.
- - Edit hatch patterns and fills.

***Unit: Architecture\_03 05: Career Opportunities in Drafting***

Learning Objectives:

- - Identify and demonstrate positive work behaviors needed to be employable.
- - Develop and use criteria to select works for a digital career portfolio.
- - Evaluate and compare employment opportunities that match career goals.
- - Examine licensing, certification, education, and industry credentialing requirements for careers in design and construction industry.
- - Identify opportunities and research requirements for career advancement.

***Unit: Architecture\_03 06: Course Wrap-up/Final Exam***

Learning Objectives:

- - Completion

***Unit: Architecture\_03 07: Architectural Drafting Project***

Learning Objectives:

- - Completion

***Unit: Architecture\_03 00: Module 0***

Learning Objectives:

- - Completion

**Building Maintenance Technologies*****Unit: BuildMT 01: Health, Safety, and Environmental Management Systems***

Learning Objectives:

- - Understand the role and the purpose of the Occupational Safety and Health Administration (OSHA) rules and regulations.
- - Identify and locate Safety Data Sheets (formerly called Material Safety Data Sheets (MSDS)) and follow the procedures as necessary.
- - Describe "Right-to-Know" Law as recorded in (29 CFR-1910.1200)
- - Identify and use safety equipment and personal protective equipment (PPE).
- - Describe personal and jobsite safety rules and regulations that maintain safe and healthy work environments.
- - Explain emergency procedures to follow in response to workplace accidents.

***Unit: BuildMT 00: Module 0***

Learning Objectives:

- - Completion

***Unit: BuildMT 04: Basic Hand and Power Tools***

Learning Objectives:

- - Describe the development of construction technology, its impact on the built environment and the impact of growth on the construction industry.
- - Identify and use various common screwdriver and drill bit types.
- - Select and use various types of non-adjustable wrenches, adjustable wrenches and plumbing tools, chisels and punches, pliers, ripping bars and nail pullers, woodworking

files, spirit levels, socket wrench sets, hand or block sanders, carpenters' squares, clamps and shovels.

- - Identify power tools including sanders, drills, circular saws, jig saws, reciprocating saws, radial-arm saws, table saws, band saws miter saws, drill presses, grinders, electric routers and pneumatic nailers.
- - Describe the proper operation of power tools and equipment.

#### ***Unit: BuildMT 05: Construction Math Part I***

Learning Objectives:

- - Solve job-related problems by adding, subtracting, multiplying and dividing numbers, using fractions, decimals and whole numbers.
- - Change numbers to percentages.
- - Demonstrate knowledge of arithmetic operations.
- - Read a ruler and a tape measure.
- - Compute feet, inches and yards.

#### ***Unit: BuildMT 02: The Construction Industry Part I***

Learning Objectives:

- - Describe the development of construction technology, its impact on the built environment and the impact of growth on the construction industry.
- - Describe the benefits of the construction industry on health and safety, communication, transportation and the economy.
- - Demonstrate an understanding of the relationship between construction and the environment.
- - Describe the role of trade unions in the construction industry and research apprenticeship opportunities.
- - Identify the different classifications of construction projects.

#### ***Unit: BuildMT 03: The Construction Industry Part II***

Learning Objectives:

- - Define the roles and responsibilities of the general contractor, specialty contractor, construction management and design build firms.
- - Research construction trade occupations and the roles and responsibilities of each craft.
- - Research construction management occupations and the roles and responsibilities of each.
- - Identify design and engineering occupations and the roles and responsibilities of each.
- - Explain the relationship between construction and the economy.

- - Describe the process of applying for building permits and variances and demonstrate an understanding of zoning requirements.

***Unit: BuildMT 06: Construction Math Part II***

Learning Objectives:

- - Change hours and minutes to decimals, fractions and mixed numbers.
- - Analyze and apply data and measurements to solve problems and interpret documents.
- - Determine ratios and proportions.
- - Convert decimals to fractions and fractions to decimals.
- - Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares and cylinders.

***Unit: BuildMT 07: Carpentry***

Learning Objectives:

- - Construct various types of concrete forms.
- - Describe in-beds used in concrete formwork.
- - Identify appropriate form stripping and handling techniques.
- - Lay out and install framing members for a structure.
- - Dry in a structure.

***Unit: BuildMT 08: Construction Drawings***

Learning Objectives:

- - Identify basic construction drawing terms, components and symbols.
- - Locate sections, elevations and details to their location on the plan view.
- - Use drawing dimensions to lay out a construction project.
- - Read architectural scales.

***Unit: BuildMT 09: Framing Floor Systems Part I***

Learning Objectives:

- - Identify floor and sill framing and support members.
- - Name the methods used to fasten sills to the foundation.
- - Understand how girder/beam and joist sizes are selected.
- - Identify different types of floor joists.
- - Identify different types of bridging.

***Unit: BuildMT 10: Framing Floor Systems Part II***

Learning Objectives:

- - Identify different types of flooring materials.
- - Explain the purposes of subflooring and underlayment.
- - Match selected fasteners used in floor framing to their correct uses.
- - Estimate the amount of material needed to frame a floor assembly.
- - Demonstrate the ability to lay out and construct a floor assembly, install bridging, joists, subfloor and a single floor system

***Unit: BuildMT 11: Framing Walls and Ceilings Part I***

Learning Objectives:

- - Identify the components of a wall and ceiling layout.
- - Lay out a wood frame wall, including plates, corner posts, door and window openings, partition Ts, bracing and the use of fire stops where applicable.
- - Describe the correct procedure for assembling and erecting an exterior wall.
- - Identify the common materials and methods used for installing sheathing on walls.
- - Lay out, assemble, erect, and brace exterior walls for a frame building.

***Unit: BuildMT 12: Framing Walls and Ceilings Part II***

Learning Objectives:

- - Describe wall framing techniques used in masonry construction.
- - Explain the use of metal studs in wall framing.
- - Demonstrate correct procedure for laying out ceiling joists.
- - Cut and install ceiling joists on a wood frame building.

***Unit: BuildMT 13: Framing a Roof***

Learning Objectives:

- - Define the terms associated with roof framing.
- - Identify the roof framing members used in gable and hip roofs.
- - Calculate the length of a rafter using various methods.
- - Identify the various types of trusses used in roof framing.
- - Use a rafter framing square, speed square and calculator in laying out a roof.
- - Identify various types of sheathing used in roof construction.
- - Frame a gable roof with vent openings.
- - Frame a roof opening.
- - Erect a gable roof using trusses.
- - Estimate the materials used in framing and sheathing a roof.

***Unit: BuildMT 14: Course Wrap-up/Final Exam***

Learning Objectives:



- - Completion

### Future of Home Construction

#### *Unit: FHC 01: Introduction to Home Construction*

##### Learning Objectives:

- - Examine the timeline of how construction started and has evolved in the United States
- - Describe how the economy impacts the home construction industry
- - Discuss the growth of the home construction industry as it relates to economic trends and population growth in the United States
- - Identify the costs associated with building and maintaining a home
- - Examine the impact that technology has and will have on the home construction industry

#### *Unit: FHC 02: Academic Foundations for Careers in Construction*

##### Learning Objectives:

- - Evaluate the necessity of basic mathematics in home construction and use basic math functions to complete job site/workplace tasks
- - Use geometric formulas to determine areas and volumes of various structures
- - Use appropriate formulas to determine percentages /decimals
- - Use appropriate formulas to determine ratios, fractions, and proportion measures.
- - Use appropriate formulas to determine measurements of dimensions, spaces, and structures.

#### *Unit: FHC 00: Module 0 - Start Here*

##### Learning Objectives:

- - Completion

#### *Unit: FHC 03: Technical Skills in Home Construction*

##### Learning Objectives:

- - Recognize elements and symbols of blueprints and drawings
- - Interpret and explain standards and specifications
- - Use architect's plan, manufacturer's illustrations, and other materials to communicate specific data and visualize proposed work
- - Select tools, machinery, equipment, and resources that match requirements of the job
- - Read current periodicals, industry publications, and manufacturer's catalogs

#### *Unit: FHC 04: Project Planning in Home Construction*

##### Learning Objectives:

- - Plan, organize, schedule, and manage a project/job to optimize workflow and outcome
- - Estimate resources/materials required for a specific project or problem
- - Use available resources/materials effectively while completing a project or resolving a problem with a project plan
- - Determine alternative solutions for a specific project/problem
- - Generate a project update that tracks changes necessitated by unexpected events and conditions

#### ***Unit: FHC 05: Safety and Health in Home Construction***

##### Learning Objectives:

- - Demonstrate methods to correct common design and construction hazards
- - Identify types and sources of workplace hazards common to design and construction situations
- - Demonstrate principles of safe physical movement to avoid slips, trips, and spills
- - Inspect and use personal protective equipment (PPE)
- - Locate and identify specific organizational policy, rule, or procedure to assist with a given situation

#### ***Unit: FHC 06: Contracts and Regulations in Home Construction***

##### Learning Objectives:

- - Understand contractual relationships with all parties involved in the building process to ensure successful build of a project.
- - Design and implement submittal approval procedures to ensure effective flow of information in construction process.
- - Understand construction subcontracts and manage working relationships on a project.
- - Locate appropriate information on organizational policies in handbooks and manuals.
- - Discuss how specific organizational policies and rules influence a specific work situation.

#### ***Unit: FHC 07: Careers in Home Construction***

##### Learning Objectives:

- - Identify the various roles in the construction of a home
- - Discuss the physical responsibilities within each role in the construction of a home
- - Explore the safety regulations associated with each role in the construction of a home
- - Identify the certifications or legal requirements necessary for each role in the construction of a home
- - Evaluate the compensation and expectations for each role in the construction of a home

***Unit: FHC 08: Owning a Construction Business***

Learning Objectives:

- - Describe the steps necessary to start a construction business
- - Evaluate the pros and cons to opening a Sole Proprietorship, S-Corporation, or C-Corporation
- - Identify the roles necessary within the office of a construction company
- - Analyze the cost difference between having full-time employees as opposed to contractors
- - Describe strategies used to promote collaboration, trust, and clear communication among contractors, suppliers, clients, and others on a job site

***Unit: FHC 09: Green Construction***

Learning Objectives:

- - Define green construction and discuss its benefit to the environment
- - Describe the differing components between a home construction and a green home construction project
- - Evaluate green materials which may be used in place of traditional construction materials
- - Compare and contrast the benefits of green roofs and solar roofs
- - Analyze the cost benefit over time to homeowners in building a green home

***Unit: FHC 10: The Future of Home Construction***

Learning Objectives:

- - Identify new and emerging technologies in green construction
- - Discuss the potential impact of robotics to construction and green construction
- - Evaluate the potential impact of artificial intelligence advances to construction and green construction
- - Discuss the future of home construction as it relates to population growth
- - Compare and contrast Smart home construction and green home construction

***Unit: FHC 11: Final Exam***

Learning Objectives:

- - Completion

**LEED Green Associate*****Unit: LEED 00: Start Here***

Learning Objectives:

- - Completion

#### ***Unit: LEED 01: Introduction to the LEED Process***

Learning Objectives:

- - Understand the mission, vision and non-profit role of USGBC/GBCI
- - Identify the structure and scope of each LEED rating system
- - Evaluate the LEED development process
- - Understand credit and Impact categories
- - Outline the LEED certification process and other rating systems

#### ***Unit: LEED 02: Integrative Strategies***

Learning Objectives:

- - Understand the Integrative process
- - Evaluate the duties and roles of project team members
- - Identify the education requirements for each integrative team member
- - Analyze the standards that support LEED

#### ***Unit: LEED 03: Location, Transportation, and Sustainable Sites***

Learning Objectives:

- - Identify the thought components of site selection
- - Investigate alternative transportation types, access, and quality
- - Evaluate the infrastructure and design of alternative transportation
- - Identify the thought components of site assessment
- - Evaluate the components of site design and development

#### ***Unit: LEED 04: Water Efficiency***

Learning Objectives:

- - Identify the green alternatives for outdoor water efficiency
- - Identify the green alternatives for indoor water efficiency
- - Evaluate the types and quality of indoor water-efficient appliances and fixtures
- - Understand water performance management over the lifetime of a structure

#### ***Unit: LEED 05: Energy and Atmosphere***

Learning Objectives:

- - Identify the components of building loads
- - Identify the green alternatives for outdoor energy efficiency as well as energy auditing
- - Analyze alternative and renewable energy practices
- - Understand energy performance management over the lifetime of a structure

- - Evaluate environmental concerns associated with energy management

***Unit: LEED 06: Materials and Resources***

Learning Objectives:

- - Describe the need for reuse of materials and resources
- - Evaluate life-cycle impacts including life-cycle assessment
- - Identify the types of waste
- - Analyze the components of a waste management plan
- - Evaluate the need for purchasing and disclosures as related to the EPP

***Unit: LEED 07: Indoor Environmental Quality***

Learning Objectives:

- - Identify the risk factors to indoor air quality
- - Identify the green alternatives for indoor air quality
- - Understand the need and value of lighting quality and the various green alternatives
- - Identify the green alternatives of acoustics
- - Evaluate the value and tools to support occupant comfort, health, and satisfaction

***Unit: LEED 08: Project Surroundings, Public Outreach, and Exam Preparation***

Learning Objectives:

- - Evaluate the environmental impacts of the built environment
- - Understand the relationship between LEED and codes
- - Analyze the values of sustainable design
- - Understand the need for regional green design and construction measures
- - Understand the structure and requirements of the LEED Green Associate Certification Exam

***Unit: LEED 09: Course Wrap-up/Final Exam***

Learning Objectives:

- - Completion

## TPC

### TPC Air Conditioning & Refrigeration Training

***Unit: 431 The Refrigeration Cycle***

Learning Objectives:

- - Define refrigeration and air conditioning and explain how they differ.

- - Describe the two methods of lowering the temperature of a material.
- - Name the three physical states of matter.
- - Identify what causes matter to change its state.
- - Explain the difference between sensible and latent heat.
- - Compare the Fahrenheit and Celsius temperature scales and convert temperatures from one to another.
- - Name and describe the three methods of heat transfer.
- - Define latent heat of fusion and latent heat of vaporization.
- - Explain the difference between absolute pressure and gauge pressure.
- - Describe the effect of pressure changes on boiling point.
- - Explain the function of each of the major refrigeration system components: evaporator, compressor, condenser, and metering device.
- - Define the terms subcooling and superheating.
- - Explain the function of the refrigerant in a refrigeration system and trace its path.
- - Contrast dry-expansion and flooded evaporators.
- - Name the five main types of compressors.
- - Define cooling medium and name the two most commonly used.
- - Explain the operation of the six most common metering devices.
- - State the definition of psychrometrics.
- - List the four air properties important in psychrometrics.
- - Differentiate between dry- and wet-bulb temperature and tell how each is measured.
- - Define the term saturated air.
- - Define specific humidity and relative humidity.
- - Define enthalpy and explain how it is calculated.
- - Demonstrate how to use the psychrometric chart to determine dewpoint temperature, specific humidity, relative humidity, and enthalpy.
- - Describe a gauge manifold and tell how it is used.
- - Tell what it means to evacuate a refrigeration system and tell how it is done.
- - List and describe at least three methods of leak detection.
- - Explain the construction of a sling psychrometer and tell how and why it is used.
- - Name the instrument used to measure relative humidity.
- - Name the instrument used to measure each of the following electrical values: potential difference, current, resistance, and electric power.
- - List the four classes of work area hazards, and give an example of each.

***Unit: 432 Refrigerants and Refrigerant Oils***

No Learning Objectives available.

***Unit: 433 Compressors***

No Learning Objectives available.

***Unit: 434 Evaporators and Metering Devices***

No Learning Objectives available.

***Unit: 435 Condensers and Cooling Towers***

No Learning Objectives available.

***Unit: 436 Piping***

No Learning Objectives available.

***Unit: 437 Control Systems***

No Learning Objectives available.

***Unit: 438 Air Handling Systems***

No Learning Objectives available.

***Unit: 439 System Troubleshooting***

No Learning Objectives available.

***Unit: 440 Absorption Chillers***

No Learning Objectives available.

***Unit: 441 - Heat Pumps***

No Learning Objectives available.

***Unit: 464 Purging, Piping, and Safety***

No Learning Objectives available.

**TPC Ammonia Refrigeration*****Unit: 461 Ammonia Refrigeration Basics***

No Learning Objectives available.

***Unit: 462 Positive Displacement Compressors***

No Learning Objectives available.

***Unit: 463 Evaporators, Conditioners, and Controls***

No Learning Objectives available.

**TPC Building & Grounds Maintenance*****Unit: 361 Introduction to Carpentry***

Learning Objectives:

- - Identify the safety equipment that a carpenter should wear to protect his eyes, hands, and feet.

- - List the twelve common layout tools mentioned in this lesson.
- - Describe how to check the accuracy of a framing square.
- - Tell how you would acquire the hand tools you need as a carpenter trainee.
- - Point out the features that you'd look for when buying your own toolbox.
- - List the twelve safety rules for power tools mentioned in this lesson.
- - Explain how to mount a new blade properly in a circular saw.
- - Tell how to start and finish a cut with a circular saw.
- - Describe how to drill wood safely with a power drill.
- - Tell how to shape an edge with a router.
- - Identify the three steps involved in sanding a surface with a finishing sander.
- - Describe the difference between the actual and nominal dimensions of lumber.
- - Tell how defects such as checks, knots, and warping limit the value and use of lumber.
- - Explain how kiln drying of lumber produces different results from air drying.
- - Point out the differences between solid core and veneer core plywood.
- - Describe the construction and uses of particleboard.
- - Compare common nails, casing nails, and finishing nails.
- - List the information you must give your supplier when ordering wood screws.
- - Explain the difference between a board foot and a linear foot of lumber.
- - Describe the relationship between a bundle and a square of roofing shingles.
- - List the information contained in a bill of material.
- - Name the factors you need to prepare a cost estimate for labor on a job.
- - Point out some of the things you must do before beginning a job, so the work goes smoothly.
- - Name the features of a building that you'll find in the plan and elevation views.
- - Demonstrate how to use an architect's scale and a draftsman's scale.
- - List at least four building features whose details are contained in the specifications.
- - Explain why building codes are necessary in the construction industry.
- - Describe the information you must submit to obtain a building permit.

#### ***Unit: 362 Constructing the Building Shell***

No Learning Objectives available.

#### ***Unit: 363 Finishing the Building Interior***

No Learning Objectives available.

#### ***Unit: 364 Structural Painting***

No Learning Objectives available.

#### ***Unit: 366 Flat Roof Maintenance***

Learning Objectives:



- - Name and define the four basic components that make up a flat roof system.
- - Explain the differences among a prestressed concrete deck, a precast deck, and a reinforced deck.
- - Explain the functions of a vapor barrier.
- - Tell why thermal insulation is applied above deck in some applications, and below deck in others.
- - List three benefits of coating a flat roof with aggregate or crushed slag.
- - Explain how a base flashing and a counter flashing work together to protect a roof.
- - Tell how and why a hot vent is usually flashed differently from a cold vent.
- - Name three roof conditions that make it necessary to install expansion joints.
- - Describe how the components of a flat roof drainage system work together
- - Tell how to keep moisture out of parapet walls.
- - Describe the causes of blisters, bare spots, and punctures.
- - Explain how dirt and debris create maintenance problems on flat roofs.
- - Name the most common reasons for vent flashing failure.
- - List the steps to take to prevent water from ponding on a flat roof.
- - Tell how to set heavy equipment on a flat roof without damaging the membrane.
- - Tell what a roofing bond or guarantee usually covers and doesn't cover.
- - List the materials and information that a roof inspector should have for his guidance.
- - Describe two ways of telling whether the roofing bitumen is asphalt or coal tar.
- - Explain how water can seep through roof penetrations, pitch pockets, and parapet walls.
- - Describe a simple means for measuring the moisture content in a roof system.
- - Name the basic materials that should be stocked for making roof repairs.
- - Tell how to repair a split membrane if sealing tape isn't available.
- - Describe how to repair a hole in a base flashing.
- - Explain how moisture can cause a parapet wall to crack and crumble.
- - Explain how to channel a roof leak to a floor drain.
- - Describe how to use tools, ladders, and hoists safely when repairing roofs
- - Name and describe the three types of single-ply roofing materials.
- - Detail the roof-laying methods used with each of these types.
- - Identify actions that would void a typical roof warranty and explain why it is important to keep the warranty in effect.
- - Explain the six key points that should be checked in the inspection of a single-ply roof.

***Unit: 367 Plumbing Systems Maintenance***

No Learning Objectives available.

***Unit: 374 Locks and Key Systems***

Learning Objectives:

- - Use standard lock and door terminology.
- - Differentiate between right-hand and left-hand doors, and between hollow-core and solid-core doors.
- - List four different types of hinges.
- - Explain installation procedures for full-mortise, half-mortise, full-surface, and half-surface hinges.
- - Identify the mortise lock, auxiliary lock, tubular bolt lock, key-in-knob lock, unit lock, and narrow-stile lock
- - Describe how a mortise lock mechanism works.
- - Tell what operations are involved in installing a mortise lock.
- - Compare the functions of rim spring-bolt locks, rim bolt locks, and jimmy-resistant locks.
- - Diagram the construction of a tubular bolt lock.
- - Explain how key-in-knob locks, unit locks, and narrow-stile locks operate.
- - Explain how to position a mortise lock with the proper setback for installation.
- - Describe installation procedures for an auxiliary lock, tubular bolt lock, key-in-knob lock, unit lock, and narrow-stile lock.
- - List the tools needed to install locks.
- - Describe how lock problems can develop.
- - List preventive maintenance practices that promote good lock function.
- - Describe the process of opening a cylinder both with and without a key.
- - Tell how to clean and lubricate lock mechanisms.
- - List common problems with bolts and latches and their remedies.
- - Describe how a master key system operates.
- - List the advantages and disadvantages of master keying.
- - Differentiate between the maison system, keyed-alike system, and sectional system.
- - List the information that must be included in the security survey plan, key progression chart, and key issuance files.
- - Identify other access control systems, such as card-key systems, electronic systems, and push-button locks.

***Unit: 375 Landscaping Maintenance***

No Learning Objectives available.

***Unit: 452 Floors and Floor Care Equipment***

No Learning Objectives available.

***Unit: 318 Industrial Rigging Principles and Practices***

No Learning Objectives available.

***Unit: 451 Cleaning Chemicals***

No Learning Objectives available.

***Unit: 453 Maintaining Floors and Other Surfaces***

No Learning Objectives available.

***Unit: 454 Rest Room Care***

No Learning Objectives available.

***Unit: 455 Carpet and Upholstery Care***

No Learning Objectives available.

**TPC Electrical Training Courses*****Unit: 201 Basic Electricity and Electronics***

No Learning Objectives available.

***Unit: 202 Batteries and DC Circuits***

No Learning Objectives available.

***Unit: 203 Transformers and AC Circuits***

No Learning Objectives available.

***Unit: 204.1 Electrical Measuring Instruments***

No Learning Objectives available.

***Unit: 205.1 Electrical Safety and Protection - v2***

No Learning Objectives available.

***Unit: 206 DC Equipment and Controls***

No Learning Objectives available.

***Unit: 207 Single-Phase Motors***

No Learning Objectives available.

***Unit: 208 Three-Phase Systems***

No Learning Objectives available.

***Unit: 209 AC Control Equipment***

No Learning Objectives available.

***Unit: 210 Electrical Troubleshooting***

Learning Objectives:

- - Identify a control relay on an electrical schematic.

- - State the NEC requirements for fuses in ungrounded conductors.
- - Explain component numbering on electrical schematics.
- - Name the kinds of drawings used by electrical specialists.
- - Identify electrical symbols commonly used for building diagrams.
- - Describe a one-line diagram.
- - Discuss the different types of drawing characteristics.
- - Explain how severe three-phase voltage unbalance affects a three-phase motor.
- - List the advantages of inherent protection.
- - Explain how undervoltage release works.
- - Describe how to troubleshoot a motor circuit.
- - List the reasons why a magnet coil burns or short-circuits.
- - List the steps in troubleshooting a defective motor.
- - Explain how a mechanical latching relay works.
- - Explain how an electronic timing relay operates.
- - Demonstrate how to reverse the rotation of a three-phase induction motor.
- - Explain the function of limit switches in reversing-motor applications.
- - Describe how to use a checking-sequence chart.
- - Select the best starter for use where it is undesirable to put a heavy load on the power supply.
- - Explain how to change the speed of a squirrel-cage motor.
- - Explain the effects of age on a selenium rectifier.
- - Name the protective devices used in electrical systems and pneumatic systems.
- - State the definition of a bistable device.
- - List the functions of a static control device.
- - List causes of electrical and mechanical vibration in a dc motor.
- - Explain how oil saturation affects brushes in a dc motor.
- - Explain how maximum bearing operating temperature is determined.
- - List problems in the motor control that can cause sudden or unexpected changes in motor speed.
- - Explain how to salvage a water-soaked motor.
- - Identify various kinds of three-phase motor failures.
- - Demonstrate how to conduct a balanced-current test on a three-phase, Y-connected winding.
- - List the symptoms of a reversed phase in a three-phase winding.
- - Explain how to identify external leads that have become defaced.
- - Demonstrate how to test for an open circuit in a split-phase motor.
- - Describe the elements of a planned maintenance program.
- - Explain the function of lamps, ballasts, and lighting controls.
- - Describe the basic troubleshooting process.

- - Detail how to troubleshoot common lamp-ballast system problems.
- - Describe lighting system commissioning.
- - Detail how to troubleshoot common occupancy-sensor and dimming-system problems.
- - Name and describe the elements of a sequence of operation.
- - List the features that must appear on an elementary wiring diagram to make it comply with JIC standards.
- - List the steps in troubleshooting a new machine.
- - List the information to be included in a motor location file.
- - Select the best method for identifying a motor.

***Unit: 211 Electrical Safety in the Workplace - Understanding NFPA 70E v2015***

No Learning Objectives available.

***Unit: 1005 Introductory - Introduction to Electricity***

No Learning Objectives available.

***Unit: 1006 Introductory - Mobile Electricity***

Learning Objectives:

- - Understand fundamentals of electricity such as voltage, current, basics of magnetism and Ohm's Law
- - Understand inductance, capacitance, and resistance
- - Understand the basics of DC circuits, including series circuits, parallel circuits, and series parallel circuits
- - Understand fundamental components that control circuit current and voltage, their applications, and their associated symbols
- - Understand how a battery stores and dispenses electrical power
- - Understand the alternator, which generates electricity and works with a voltage regulator to charge the battery and supply electrical power to the rest of the vehicle's electrical system
- - Understand the starting system, and the variations of components in the two circuits of the starting system
- - Understand remote start and stop features associated with many mobile vehicles

***Unit: 1008 Introductory - ACDC Drives***

No Learning Objectives available.

***Unit: 1009 Introductory - Multimeter Basics***

Learning Objectives:

- - Understand the fundamentals of using electrical testers
- - Understand testing circuits

- - Understand different circuit components

#### TPC Industrial Electronics

##### *Unit: 251 Semiconductors*

No Learning Objectives available.

##### *Unit: 252 Power Supplies*

No Learning Objectives available.

##### *Unit: 253 Amplifiers*

No Learning Objectives available.

##### *Unit: 254 Oscillators*

No Learning Objectives available.

##### *Unit: 291 Digital Logic Systems*

No Learning Objectives available.

#### TPC Welding Online Training

##### *Unit: 416 Blueprint Reading for Welders*

Learning Objectives:

- - Define and identify common fractions and decimal fractions.
- - Define the term equivalent fraction.
- - Perform calculations using common fractions and decimal fractions.
- - Convert between common fractions and decimal fractions.
- - Read and perform measurements using a standard rule or tape measure.
- - Explain the use of calculators in welding.
- - Explain the importance of information on blueprints.
- - Explain the differences between assembly drawings and detail drawings.
- - Describe methods used to create and reproduce blueprints.
- - Define and describe parts of a blueprint.
- - Identify elements located within the title block of a detail drawing.
- - List methods of care and security of blueprints.
- - Identify the standard lines used on blueprints.
- - Explain the meaning and applications of standard lines on blueprints.
- - Identify common views used on a blueprint.
- - Name the advantages and disadvantages of various projection types.
- - Explain the concept of visualization.
- - Identify and describe the five basic weld joints.

- - Define the following terms: bead, stringer bead, weave bead, base metal, filler metal, root pass, hot pass, fill pass, cap, hardfacing.
- - Identify and describe the basic weld types.
- - Name the basic welding positions and give advantages of the flat position.
- - Identify which side of a structure a weld is to be made from.
- - Identify the kind of chamfer to be cut on a joint to be welded, and which part is to be chamfered.
- - State the required dimensions of a weld.
- - Identify the contour required on a finished weld.
- - State how a weld contour is to be finished.
- - Differentiate between welds that are to be made at the site of final assembly and welds that are to be made before the parts are shipped to the site.
- - Explain the concepts of squares and square roots of numbers.
- - Define the following kinds of angles: zero degree, acute, straight, right, and obtuse.
- - State the Pythagorean Theorem and explain its usefulness.
- - Define the following terms related to circles: radius, diameter, arc, and circumference.
- - Give the equations for finding a circle's circumference and area if you know its radius.
- - Explain the use of the following measuring tools: calipers, micrometers, and protractors.
- - Demonstrate how to convert measurements from inches to millimeters and from millimeters to inches.

### *Unit: 417 Welding Principles*

#### Learning Objectives:

- - Describe fusion welding, resistance welding, filler rods, and electrodes.
- - Compare the oxyfuel and arc welding processes and compare the SMAW, GMAW, and GTAW processes.
- - Describe and sketch the following kinds of joints—butt, lap, tee, corner, and edge.
- - Describe the following kinds of welds—groove, fillet, plug, slot, spot, and seam.
- - Name and locate the parts of a weld.
- - Discuss basic considerations in joint design and fitup.
- - Explain the importance of good housekeeping in an area where welding is taking place.
- - List at least three precautions to take to avoid fires and explosions when welding.
- - Describe two methods of protecting yourself against the fumes and gases associated with welding.
- - Describe the personal protective equipment required when welding.
- - Explain the precautions to take when using and handling cylinders and regulators.
- - Briefly describe the oxyfuel welding process and the components of an oxyfuel welding outfit, including the lighting device.

- - Discuss safety precautions and personal protective gear required for working with oxyfuel equipment.
- - List the steps involved in preparing to weld.
- - Compare the neutral, carburizing, and oxidizing flames.
- - List the steps in safely shutting down an oxyfuel welding system.
- - List similarities and dissimilarities between oxyfuel welding and arc welding.
- - Describe the electric welding circuit, including choice of ac or dc, dc polarity, and power sources.
- - Discuss welding machine ratings in terms of amperage and duty cycle and describe features and uses of transformer, generator, rectifier, and inverter welding machines.
- - Discuss welding cable considerations and describe the electrodes and electrode holders used for SMAW, GMAW, and GTAW processes.
- - Discuss the personal safety gear and precautions necessary for arc welding and explain how arc welding accessories are used.
- - Explain what considerations affect the selection of a welding process.
- - Describe the four welding positions.
- - Explain why overhead welds are difficult to make and tell how to make them.
- - Describe the preparation required for oxyfuel welding, SMAW, GMAW, and GTAW processes.
- - Describe the procedures involved in oxyfuel welding, SMAW, GMAW, and GTAW processes.
- - Describe the effects of electrode selection, current, arc length, and travel speed on arc welding procedures.
- - Describe common causes of arc blow, a hard-to-start arc, and spatter, and explain why proper fitup is important.
- - Define the terms overlap, undercut, blowhole, and inclusion and explain the causes of each.
- - Explain how expansion and contraction can be controlled when welding.
- - Name and describe the various tests used to identify metals.
- - Identify which side of a structure a weld is to be made from.
- - Identify the kind of chamfer to be cut on a joint to be welded, and which part is to be chamfered.
- - State the required dimensions of a weld.
- - Identify the contour required on a finished weld.
- - State how a weld contour is to be finished.
- - Differentiate between welds that are to be made at the site of final assembly and welds that are to be made before the parts are shipped to the site.

### ***Unit: 418 Oxyfuel Operations***

Learning Objectives:



- - Explain how oxyfuel welding joins metals and how it differs from arc welding.
- - Explain how braze welding and torch brazing are different from oxyfuel welding and from each other.
- - Discuss the purposes for using flux and characteristics that make a flux suitable for an application.
- - Compare the appearance and general uses of the carburizing flame, neutral flame, and oxidizing flame.
- - Explain why preheating and postheating are used.
- - List important considerations in welding common mild steels, stainless steel, and cast and wrought iron.
- - Discuss characteristics of aluminum that are important in welding.
- - Explain how to use aluminum alloy designations.
- - Describe procedures used in aluminum joint preparation and in aluminum welding.
- - Discuss characteristics of copper and copper alloys that are important in welding.
- - Discuss procedures for welding copper, brass, and bronze.
- - Discuss procedures for welding lead, nickel, and magnesium.
- - Summarize general standard procedures for making optimum welds.
- - Explain the similarities and differences between oxyfuel cutting and oxyfuel welding.
- - Describe the equipment and safety precautions necessary for torch cutting and list standard steps in the torch cutting operation.
- - Describe special equipment or methods used in cutting bevels, piercing holes, cutting circles, and cutting away rivets.
- - Explain why gouging, scarfing, and washing are used.
- - Explain methods used on metals that are otherwise difficult to cut.
- - Compare and contrast brazing, braze welding, and oxyfuel fusion welding.
- - Describe the materials and procedures used in brazing and braze welding.
- - Explain important special considerations in braze welding cast and malleable iron, brazing aluminum, and brazing stainless steel.
- - List the safety precautions necessary for brazing and braze welding operations.
- - Explain how soldering differs from brazing and describe the materials and procedures used in soldering.
- - Define hard face welding and thermal spraying as used for surfacing purposes and discuss general uses of each.
- - Discuss advantages and disadvantages of detonation-gun, plasma, and electric arc thermal spraying and explain how each is done.
- - Describe the processes of torch hard facing and flame spraying.
- - Name several common surfacing materials and discuss one or more characteristics of each.
- - List the steps, including those for surface preparation, in repairing a shaft by means of thermal spraying.

- - Discuss the safety precautions necessary to prevent or minimize hazards from surfacing processes.

### *Unit: 419 Arc Welding Operations*

#### Learning Objectives:

- - Define arc length and explain its importance.
- - Explain how the metal arc welding process works.
- - Tell what provides the shield in shielded metal arc welding.
- - List factors to consider when selecting an electrode.
- - Describe the personal protective equipment necessary for welding.
- - List the factors involved in selecting SMAW electrodes.
- - Explain how to identify different welding electrodes.
- - Give examples of several kinds of electrode coverings and tell when each is used.
- - Describe correct procedures for handling, storing, and conserving electrodes.
- - Name and describe the three basic types of metal transfer for GMAW.
- - Name the most common shielding gases used in GMAW and tell what factors influence their selection.
- - List factors that affect the selection of an electrode for GMAW.
- - Describe GMAW gun operation.
- - List the advantages of GTAW over other welding processes.
- - Describe the equipment and supplies needed for GTAW.
- - Explain the purpose of the electrode in GTAW and tell how this differs from other types of welding.
- - Properly select shielding gases and filler metals for GTAW.
- - Outline GTAW procedures, including welding preparation.
- - Explain the concepts of resistance spot welding and resistance seam welding.
- - Define flash welding, upset welding, and percussion welding, and tell how they differ.
- - Tell how submerged arc welding and plasma arc welding differ from other arc welding methods.
- - Describe the three forms of friction welding.
- - Name two advantages of ultrasonic welding.
- - Describe the effects of unequal or rapid heating and cooling on base metals and weld beads.
- - Define the heat-affected zone and tell what changes can occur there during welding.
- - Explain the benefit of preheating and when it should be used.
- - List several factors in welding jobs that make postheating advisable.
- - Describe methods and materials for preheating and postheating.
- - Define ferrous metals and describe their characteristics, including weldability.
- - Explain cleaning and edge preparation required prior to welding ferrous metals.

- - Name the welding processes and practices that are used for different types and thicknesses of ferrous metals.
- - List several different electrode types and their advantages for welding ferrous metals.
- - Observe specific procedures when welding alloy steels.
- - Describe some of the methods of identifying different nonferrous metals.
- - Name the special properties of several nonferrous metals and explain how these properties affect welding preparations and procedures.
- - Compare seven arc cutting processes used for edge preparation of nonferrous metals.
- - Explain proper methods of cleaning nonferrous metals prior to welding.
- - Identify the welding processes that are suitable for nonferrous metals.
- - Compare the advantages of welded pipe joints to bolted or screwed connections.
- - Discuss pipe welding codes and what they cover.
- - Describe the welding processes used for joining pipe and their respective advantages and disadvantages.
- - Identify some special methods and accessories that are used in pipe welding as opposed to flat welding.
- - Give examples of the uses of preheating and postheating in pipe welding.
- - List several purposes of hard facing and rebuilding.
- - Identify the different types of surfacing alloys and their particular uses.
- - Describe effective cross-checking and explain why it is desirable.
- - Explain the special techniques used in hard facing and tell why they are necessary.
- - Name the welding processes used in hard facing and tell why they are adapted to this work.

## Teach Construction

### Basic Power Saws

#### *Unit: Basic Power Saws: Saw Blades*

##### Learning Objectives:

- - Describe the concept of blade kerf and how to compensate for it when making an accurate cut with various power saws.
- - Demonstrate the process of blade changes for various power saws.
- - Describe blades for different power saws, variations of tooth count and blade materials, and other aspects like blade size or length and thickness.

#### *Unit: Basic Power Saws: Miter Saw*

##### Learning Objectives:

- - Describe the proper way to carry, set up for use, and tear down a miter saw.

- - Identify the different parts and features of a miter saw and how they affect the way the tool works.
- - Describe the difference between a miter and a bevel setting and the pros and cons of each.
- - Demonstrate the proper use of a miter saw and techniques that lead to safe and accurate cuts.

#### ***Unit: Basic Power Saws: Circular Saw***

##### Learning Objectives:

- - Demonstrate the proper use of a circular saw and techniques that lead to safe, accurate, and straight cutting.
- - Understand the difference between a direct and worm gear saw, how they operate, and the pros and cons of each.

#### ***Unit: Basic Power Saws: Reciprocating Saw***

##### Learning Objectives:

- - Identify circumstances when a reciprocating saw can be useful for cuts.
- - Identify the parts and features of a reciprocating saw and their adjustments.

#### ***Unit: Basic Power Saws: Jigsaw***

##### Learning Objectives:

- - Demonstrate the proper use of a jigsaw and techniques that lead to safe, accurate, and straight, and curved cutting.
- - Identify the parts and features of a jigsaw and its adjustments.

#### ***Unit: Basic Power Saws: Table Saw***

##### Learning Objectives:

- - Demonstrate the proper use of a table saw and techniques that lead to safe, accurate, and straight rip cuts.
- - Identify the parts and features of a table saw and its adjustments.

### **Basic Tools and Materials in Construction**

#### ***Unit: Basic Tools and Materials: Hand Tools***

##### Learning Objectives:

- - Identify common hand tools and facts about each including key parts, variations of the tool and proper uses.
- - Describe safety concerns when using basic hand tools.

***Unit: Basic Tools & Materials: Basic Power Tools***

Learning Objectives:

- - Identify basic power tools and facts about each including key parts, variations of the tool and proper uses.
- - Describe safety concerns when using basic power tools.

***Unit: Basic Tools and Materials: Wood-based Materials***

Learning Objectives:

- - Describe grain characteristics of wood.
- - Identify common lumber defects and how to recognize each.
- - Explain nominal and actual dimensions of stock lumber.
- - Describe general information about sheet goods, common dimensions and their purpose related to sheathing and decking.

***Unit: Basic Tools and Materials: Fasteners***

Learning Objectives:

- - Identify different fastener coating options and describe the purpose of each.
- - List and describe common nail types used for building.
- - List and describe common screw types used for building.

***Unit: Basic Tools and Materials: Hammers***

Learning Objectives:

- - Identify parts, types and proper use of a hammer.
- - Describe safety concerns when using hammers.

**Construction Basics: Measure and Mark*****Unit: Measure and Mark: Tape Measure***

Learning Objectives:

- - Read the markings on a tape measure, including: feet and inch marks, half, quarter, eighth, sixteenth marks, layout symbols.
- - Interpret the numbers, marks, and symbols on a tape measure, review different tape styles, and other special markings found on a typical tape.

***Unit: Measure and Mark: Speed Square***

Learning Objectives:

- - Identify the parts, features, and correct use of a speed square.
- - Use proper measuring and marking techniques with speed squares .

***Unit: Measure and Mark: Chalk Line***

Learning Objectives:

- - List the parts, features, and correct use of a chalk line.
- - Use proper marking techniques with chalk lines.

***Unit: Measure and Mark: Levels***

Learning Objectives:

- - Describe the parts, features, and correct use of a level.
- - Use proper techniques with levels to determine the state of both plumb and level.

**DEL Safety in Construction*****Unit: General Safety***

Learning Objectives:

- - Identify the various types of PPE used for hazard prevention to include head, hand, eye, foot, skin, hearing, and breathing protection.
- - Describe the four main categories of fatal hazards as named by OSHA and give examples of each.
- - Describe common jobsite hazards that can lead to personal injury.

***Unit: Ladder Safety***

Learning Objectives:

- - Identify different types and styles of ladders and the parts and features that make them function.
- - Perform safe setup, ascension, descension, and work while using ladders.

***Unit: Fire Safety***

Learning Objectives:

- - Describe hazards associated with construction materials and methods to prevent injury from exposure.
- - Identify fire hazards, how and when fire can occur on a jobsite.
- - Prepare for, protect against, and prevent fire and features that make them operate safely and effectively.
- - Describe and consistently perform safe and effective methods of material handling that avoid injury to oneself and others.

## Installing Windows

### *Unit: Windows: Parts and Types*

Learning Objectives:

- - Identify various window styles and explain the details of sash configuration and operation of each type.
- - Identify the main parts and features of a typical window and how they assist the window to function properly.
- - Identify and compare different window material types and explain how they affect window performance.

### *Unit: Windows: Installation*

Learning Objectives:

- - Describe and perform the steps, tools, and materials to achieve an operable and leak proof window to include setting, securing, flashing, and sealing the unit.

## Introduction to Electrical

### *Unit: Electrician's Hand Tools*

Learning Objectives:

- - Safe use of hand tools used in the electrical trade.
- - Proper use of a multimeter, a circuit tester and a proximity tester.
- - Proper use of hand tools to cut, strip, and attach wires.

### *Unit: Electrician's Power Tools*

Learning Objectives:

- - Safe use of power tools used in the electrical trade.
- - Proper use of impact drill and a hammer drill.
- - Proper use of a reciprocating saw, portable band saw and oscillating multi tool.

### *Unit: Electrical Materials*

Learning Objectives:

- - Safe use of materials used in the electrical trade.
- - Proper use of circuit breakers, Ground Fault Circuit Interruptors and Arc Fault Circuit Interruptors.
- - Demonstrate knowledge of Romex wire gauges and color codes.

### *Unit: Electrical Wiring Process*

Learning Objectives:

- - Make proper wire connections in a standard electrical circuit
- - Route Romex cable and install electrical devices per plan through wood framing.
- - Properly set electrical junction boxes in new construction.
- - Drill holes in framing to prepare for circuit cables to be pulled.
- - Describe and demonstrate stripping Romex jacket and wire insulation to prepare for wire connections, wire splices and terminal connections
- - Identify correct conductor color coding and correct matching of colors to properly wire a circuit.
- - Finish out basic electrical circuits using junction boxes, Romex cable, and standard electrical devices.
- - Explain the difference between a single pole switched circuit and 3 way switched circuit.

### Introduction to Painting

#### *Unit: Intro to Painting: Brushes*

Learning Objectives:

- - Understand brush heads, their different configurations, bristle materials, and how various aspects of them affect performance, paint application, and finish.
- - Describe and demonstrate the process of proper cleaning, handling, and storing brushes.
- - Describe and demonstrate the proper way to load a brush with paint, apply the paint to a surface, and work it to an acceptable finish for a large surface area.
- - Describe and demonstrate ways to apply paint to a surface and work it to an acceptable finish for a smaller and/or more detailed surface area (trim).

#### *Unit: Intro to Painting: Rollers*

Learning Objectives:

- - Identify the 4 different parts of a roller system and the terms used to describe them.
- - Identify roller cover attributes and how each affects the paint delivery and final finish.
- - Choose appropriate roller components to paint a surface.
- - Demonstrate the proper way to hold a roller, load a roller with paint and apply the paint to a surface.

#### *Unit: Intro to Painting: Materials*

Learning Objectives:

- - Understand oil and water-based paints and the properties of different families of paints to include Latex, Alkyd, Epoxy, and Urethane.



- - Understand the concept of paint sheen and how it affects the way the paint appears and performs as well as common situations where each can be used effectively.

#### ***Unit: Intro to Painting: Sanding***

Learning Objectives:

- - Describe the purpose of sanding in the scope of the painting process.
- - Identify materials for sanding and how each affects the surface finish.
- - Describe the hazards related to the sanding process and choose the appropriate PPE to protect against airborne particulates.
- - Demonstrate the proper methods and materials when sanding with hand and power sanding tools.

#### ***Unit: Intro to Painting: Spackling***

Learning Objectives:

- - Demonstrate foresight to identify defects when spackling to produce a good surface for paint.
- - Repair defects using the proper tools, materials, and process when spackling to produce a good surface for paint.

#### ***Unit: Intro to Painting: Caulking***

Learning Objectives:

- - Learn the different parts and types of caulk guns and how they work to apply sealants.
- - Demonstrate the proper methods to prep and use a caulk gun to apply sealants to include tooling the bead to an acceptable finish.

#### ***Unit: Intro to Painting: Taping and Masking***

Learning Objectives:

- - Describe types and aspects of masking tapes and demonstrate methods to apply them.
- - Demonstrate the setup and use of a hand masker and identify materials used with the tool for surface protection.

### **Introduction to Plumbing**

#### ***Unit: Introduction to Plumbing: Hand Tools***

Learning Objectives:

- - Describe parts and purpose of different hand tools used for prepping copper, PEX, PVC, ABS, CPVC pipe and fittings for assembly.

- - Describe the purpose of different hand tools used for cutting and pipe and tubing to length for copper, PEX, PVC, ABS, and CPVC systems.
- - Describe specialized hand tools for installing PEX water supply systems.

#### ***Unit: Introduction to Plumbing: Power Tools***

##### Learning Objectives:

- - Describe the parts and the purpose of different power tools used for cutting and pipe and tubing to length for copper, PEX, PVC, ABS, and CPVC systems.
- - Describe specialized power tools for installing PEX water supply systems.
- - Describe parts and purpose of power tools used to modify a structure for the routing of plumbing lines.

#### ***Unit: Introduction to Plumbing: Materials***

##### Learning Objectives:

- - Size, cut, fit, and connect copper, PVC and PEX supply lines.
- - Understand and identify the various materials needed to prep and install copper, PEX, PVC, ABS and CPVC pipe and fittings.
- - List and describe materials used to seal threaded connections.

#### ***Unit: Introduction to Plumbing: Process***

##### Learning Objectives:

- - List and describe tools used to make connections with copper and brass pipe and fittings.
- - List tools used to grip and tighten pipe and fittings.
- - Describe types of fittings and valves and how each works in a plumbing supply line.
- - Explain routing, securing, and protecting plumbing lines within a wood-framed structure.

#### **Plan Reading for Construction**

##### ***Unit: Plan Reading Overview***

##### Learning Objectives:

- - Identify notes, legends, and title blocks on a set of prints.
- - Name and describe common symbols and abbreviations found on standard prints.
- - Identify different dimensions and dimension lines on a set of prints.

##### ***Unit: Scaling***

##### Learning Objectives:

- - Identify different print views and describe drawing features and details included in each.
- - Navigate a standard set of prints to find reference information to answer questions about building details.

#### ***Unit: Construction Math***

##### Learning Objectives:

- - Convert units back and forth from square inches to square feet and square yards.
- - Add, subtract, multiply, and divide fractions and whole numbers .
- - Use geometric formulas to calculate the area and volume of certain shapes to determine a material estimate.

#### **Safety in Construction**

##### ***Unit: Safety in Construction: General Safety***

##### Learning Objectives:

- - Describe the four main categories of fatal hazards as named by OSHA and give examples of each.
- - Describe common jobsite hazards that can lead to personal injury.
- - Identify the various types of PPE used for hazard prevention to include head, hand, eye, foot, skin, hearing, and breathing protection.

##### ***Unit: Safety in Construction: Ladder Safety***

##### Learning Objectives:

- - Identify different types and styles of ladders and the parts and features that make them function.
- - Perform safe setup, ascension, descension, and work while using ladders.

##### ***Unit: Safety in Construction: Fire Safety***

##### Learning Objectives:

- - Identify fire hazards, how and when fire can occur on a jobsite.
- - Describe hazards associated with construction materials and methods to prevent injury from exposure.
- - Prepare for, protect against, and prevent fire and features that make them operate safely and effectively.
- - Describe and consistently perform safe and effective methods of material handling that avoid injury to oneself and others.

## WorkForge

### WELDING SKILLS COURSES

#### *Unit: WEL-2001 Introduction to Welding*

Learning Objectives:

- - List the basic arc welding process
- - Understand weld and welding symbols
- - Identify joints and associated weld types
- - Identify weld discontinuities

#### *Unit: WEL-2003 Welding and Welding Discontinuities*

Learning Objectives:

- - Explain the basic welding process
- - Identify weld joints and weld types
- - Understand welding symbols
- - Describe arc welding processes
- - Recognize weld discontinuities

#### *Unit: WEL-2004 Welding Basics*

Learning Objectives:

- - Define welding
- - Explain how welding affects metallurgy
- - Describe the fillet welds and butt welds
- - List the different welding positions
- - Explain the basic joint types
- - Describe three AWS-recognized welding processes

#### *Unit: WEL-2005 Welding Defects*

Learning Objectives:

- - Define weld defects
- - Understand the importance of detecting weld defects
- - List testing techniques used to identify weld defects
- - Describe what can be done to prevent many weld defects
- - Explain the difference between fabrication-related and service-related defects
- - Describe the different types of fabrication-related defects

#### *Unit: WEL-2006 Arc Welding Safety*

Learning Objectives:

- - Know who establishes the safety guidelines you should follow
- - Understand arc welding hazards
- - Describe ways to increase safety

***Unit: WEL-2007 Elements of an Arc Welding Circuit***

Learning Objectives:

- - Explain the elements of an arc welding circuit
- - Describe types of power supplies
- - Describe types of power supply outputs
- - Explain the difference between constant voltage and constant current power supplies
- - Define duty cycle rating

***Unit: WEL-2008 Shielding***

Learning Objectives:

- - Define shielding
- - Understand why shielding is used
- - Describe flux shielding
- - Describe gas shielding

***Unit: WEL-2009 Arc Welding Parameters***

Learning Objectives:

- - List the main operating parameters that apply to arc welding
- - Explain each operating parameter and how it affects arc welding
- - Describe the three types of electrical polarity

***Unit: WEL-2010 Gas Metal Arc Welding (GMAW)***

Learning Objectives:

- - Describe the process of GMAW
- - List common applications for GMAW
- - Explain the advantages and limitations of GMAW
- - Describe the four modes of metal transfer
- - Understand process-specific information and variables

***Unit: WEL-2011 Flux Core Arc Welding (FCAW)***

Learning Objectives:

- - Describe the process of FCAW
- - List common applications for FCAW
- - Explain the advantages and limitations of FCAW

- - Describe the modes of metal transfer
- - Understand process-specific information and variables

***Unit: WEL-2012 Gas Tungsten Arc Welding (GTAW)***

Learning Objectives:

- - Describe the process of GTAW
- - List common applications for GTAW
- - Explain the advantages and limitations of GTAW
- - Understand process-specific information and variables

***Unit: WEL-2013 Plasma Arc Welding (PAW)***

Learning Objectives:

- - Describe the process of PAW
- - List common applications for PAW
- - Explain the advantages and limitations of PAW
- - Understand process-specific information and variables

***Unit: WEL-2014 Shielded Metal Arc Welding (SMAW)***

Learning Objectives:

- - Describe the process of SMAW
- - List common applications for SMAW
- - Explain the advantages and limitations of SMAW
- - Understand process-specific information and variables

***Unit: WEL-2015 Submerged Arc Welding (SAW)***

Learning Objectives:

- - Describe the process of SAW
- - List common applications for SAW
- - Explain the advantages and limitations of SAW
- - Understand process-specific information and variables

***Unit: WEL-2016 Electroslag Welding (ESW) and Electrogas Welding (EGW)***

Learning Objectives:

- - Describe the processes of ESW and EGW
- - list common applications for ESW and EGW
- - Explain the advantages and limitations of ESW and EGW
- - Understand process-specific information and variables

## Arts, A/V Technology & Communications

### GoSkills

#### Photoshop for Beginners

##### *Unit: Photoshop for Beginners*

Learning Objectives:

- - Understand The Swatches Panel
- - Understand Mask, Don't Erase
- - Understand Custom Shapes
- - Understand Magic Wand vs Quick Selection
- - Understand Bird's Eye View
- - Understand Removing Backgrounds
- - Understand Shape Strokes
- - Understand History States
- - Understand Layer Styles on Groups
- - Understand Clipping Masks vs Layer Masks

##### *Unit: Photo Editing – Part 1*

Learning Objectives:

- - Understand Changing Skies with Blend If
- - Understand Patch Tool Content Aware
- - Understand Color Splash Effect
- - Understand Brown to Blue Eyes
- - Understand Brighten Teeth
- - Understand Old, Cracked Photo Effect
- - Understand Clone Yourself
- - Understand Photographic Toning
- - Understand Vibrance vs Saturation

##### *Unit: Mastering the Tools*

Learning Objectives:

- - Understand Non-Destructive Burning, Dodging
- - Understand Creating Custom Brushes
- - Understand The Ruler Tool
- - Understand The Crop Tool
- - Understand Content-Aware Move
- - Understand Blur Gallery

***Unit: Start Designing***

Learning Objectives:

- - Understand Tileable Textures
- - Understand Create a Web Search Bar
- - Understand Create a Cloud Icon
- - Understand Old Paper Effect
- - Understand Puffy Clouds
- - Understand Create a Rough Ticket Icon
- - Understand Create a Wood Texture

***Unit: Text Effects – Part 1***

Learning Objectives:

- - Understand Candy Cane Text Effect
- - Understand Snow Covered Text Effect
- - Understand Neon Text Effect
- - Understand Gold 'Bling' Text Effect
- - Understand Editing Multiple Type Layers

***Unit: Photo Editing – Part 2***

Learning Objectives:

- - Understand Color Range Changes
- - Understand Oil Paint Filter
- - Understand Perspective Cropping
- - Understand Replacing the Sky
- - Understand Turn a Photo into a Painting
- - Understand 1950's Style Pin-Up Poster
- - Understand Mystical Mountain Photo Composition
- - Understand Turn Day to Night
- - Understand Create Smoke on Your Photos
- - Understand Colorize a Black and White Photo
- - Understand Carve a Heart into Snow
- - Understand Create a Winter Wonderland

***Unit: Design – Part 2***

Learning Objectives:

- - Understand Bokeh Effect
- - Understand iOS7 Photo Icons
- - Understand Create a Realistic Wax Seal



- - Understand Create Abstract Fireworks

### *Unit: Text Effects – Part 2*

Learning Objectives:

- - Understand Harry Potter Text Effect
- - Understand Chocolate Text Effect
- - Understand Frozen Text Effect
- - Understand Iron Man Text Effect
- - Understand Modern Warfare 3 Text Effect

### *Unit: PSD for Begin: Final Exam*

Learning Objectives:

- - Completion

## **Pointful Education**

### **Adobe After Effects**

#### *Unit: Adobe After Effects 01: Working in the Visual Effects and Motion Graphics Industry Part I*

Learning Objectives:

- - Determine whether content is relevant to the purpose, the audience, and their needs
- - Identify requirements based on how the video will be delivered, distributed, and/or consumed
- - Demonstrate knowledge of techniques for communicating ideas about project plans with peers and clients
- - Demonstrate knowledge of basic project management concepts
- - Identify legal and ethical considerations for using third-party content
- - Identify when and how to obtain permissions to use images, audio, or footage

#### *Unit: Adobe After Effects 02: Working in the Visual Effects and Motion Graphics Industry Part II*

Learning Objectives:

- - Demonstrate knowledge of digital video and audio terminology
- - Demonstrate knowledge of how color is represented in digital video
- - Understand and use key terms related to video and audio postproduction
- - Demonstrate knowledge of common animation terms and principles
- - Demonstrate knowledge of standard compositing techniques
- - Define common cinematic composition terms and principles
- - Identify general design principles and guidelines for motion graphics

***Unit: Adobe After Effects 03: Project Setup and Interface***

Learning Objectives:

- - Choose appropriate project settings to meet requirements
- - Create and modify compositions to match the delivery requirements
- - Identify, navigate, and manipulate elements of the After Effects interface, including workspaces, application preferences, timeline and media, markers, guides, and grids
- - Import media from various sources
- - Manage assets/footage in an After Effects project

***Unit: Adobe After Effects 04: Organizing Projects***

Learning Objectives:

- - Recognize the different types of layers in the Timeline panel
- - Use the Timeline panel to manage layers
- - Manage multiple layers in a complex composition
- - Adjust a layer's visibility
- - Create, apply, and manipulate masks and track mattes

***Unit: Adobe After Effects 05: Creating and Modifying Visual Elements Part I***

Learning Objectives:

- - Create visual elements using a variety of tools
- - Place assets into a composition
- - Create text in a composition
- - Adjust paragraph settings
- - Animate text
- - Adjust layers using a variety of tools
- - Transform visual elements in the composition

***Unit: Adobe After Effects 06: Creating and Modifying Visual Elements Part II***

Learning Objectives:

- - Change the speed of a video clip
- - Use basic auto-correction methods and tools
- - Apply and adjust a video effect or preset to a layer
- - Use 3D space to modify composition elements
- - Create composites
- - Apply and modify effects and presets on multiple layers
- - Apply and adjust transformations using keyframes
- - Animate effects using keyframes

***Unit: Adobe After Effects 07: Publishing Digital Media***

Learning Objectives:

- - Check a composition for errors and verify specifications
- - Archive a project
- - Export frames
- - Export a composition
- - Prepare for the Adobe Certified Professional Exam

***Unit: Adobe After Effects 00: Start Here***

No Learning Objectives available.

***Unit: Adobe After Effects 08: Course Wrap-up/Final Exam***

No Learning Objectives available.

**Adobe Illustrator Certification*****Unit: Module 00: Adobe Illustrator***

Learning Objectives:

- - Completion

***Unit: Module 01: Working in the Design Industry***

Learning Objectives:

- - Understand the Adobe Creative Suite and the role of the various applications.
- - Identify the purpose, audience, and audience needs for preparing graphics and illustrations.
- - Determine the type of copyright, project fit, permissions, and licensing to use specific content.
- - Demonstrate knowledge of project management tasks and responsibilities.
- - Communicate with colleagues and clients about design plans.

***Unit: Module 02: Understanding Digital Graphics and Illustrations***

Learning Objectives:

- - Navigate Adobe Illustrator
- - Identify elements of the Illustrator CC user interface and demonstrate knowledge of their functions
- - Define the functions of commonly used tools, including selection tools, the Pen tool, and other drawing tools, shape tools, and transformation tools.
- - Use non-printing, design tools in the interface, such as rulers, guides, bleeds, and artboards.

- - Navigate, organize, and customize the workspace

#### ***Unit: Module 03: Understanding Adobe Illustrator Part I***

##### Learning Objectives:

- - Navigate, organize, and customize the workspace
- - Use non-printing, design tools in the interface, such as rulers, guides, bleeds, and artboards.
- - Define the functions of commonly used tools, including selection tools, the Pen tool, and other drawing tools, shape tools, and transformation tools.
- - Identify elements of the Illustrator CC user interface and demonstrate knowledge of their functions
- - Navigate Adobe Illustrator

#### ***Unit: Module 04: Understanding Adobe Illustrator Part II***

##### Learning Objectives:

- - Use layers to manage design elements.
- - Manage colors, swatches, and gradients.
- - Manage brushes, symbols, graphic styles, and patterns.
- - Demonstrate knowledge of how and why illustrators employ different views and modes throughout the course of a project including vector/outline vs. display/appearance, isolation mode, and various Draw modes.
- - Demonstrate and understanding of vector drawing tools.

#### ***Unit: Module 05: Creating Digital Graphics and Illustrations Using Adobe Illustrator Part I***

##### Learning Objectives:

- - Create a new project
- - Use vector drawing tools
- - Use shape tools
- - Transform graphics and illustrations
- - Use basic reconstructing and editing techniques to manipulate digital graphics and media

#### ***Unit: Module 06: Creating Digital Graphics and Illustrations Using Adobe Illustrator Part II***

##### Learning Objectives:

- - /
- - Demonstrate knowledge of layers and masks.
- - Import assets into a project.
- - Add and manipulate type using Type tools.

- - Create digital graphics and illustrations using 3D and perspective tools in Illustrator.

***Unit: Module 07: Archive, Export, and Publish Graphics Using Adobe Illustrator***

Learning Objectives:

- - Prepare images for web, print, and video.
- - Export digital graphics and illustration to various file formats.
- - Understand the structure and test prep necessary for the ACA Illustrator Certification Exam.

***Unit: Module 08: Course Wrap-up/Final Exam***

Learning Objectives:

- - Completion

**Adobe InDesign Certification**

***Unit: AID Module 01: Working in the Design Industry Part I***

Learning Objectives:

- - Understand the Adobe Creative Suite and the role of the various applications.
- - Determine whether the content is relevant to the purpose, audience, and audience needs.
- - Demonstrate knowledge of techniques for communicating about design plans with peers and clients.
- - Determine the type of copyright permissions and licensing required to use specific content.
- - Determine the type of copyright permissions and licensing required to use specific content.

***Unit: AID Module 00: Start Here***

Learning Objectives:

- - Completion

***Unit: AID Module 02: Working in the Design Industry Part II***

Learning Objectives:

- - Demonstrate knowledge and understanding of key terms related to publication and multi-page layouts.
- - Demonstrate knowledge of how color is created in publications.
- - Demonstrate knowledge of elements and principles of design and common design techniques.

- - Identify and use common typographic adjustments to create contrast, hierarchy, and enhanced readability.
- - Define common photographic/cinematic composition terms and principles.

#### ***Unit: AID Module 03: Project Setup and Interface Part I***

##### Learning Objectives:

- - Create a document with appropriate settings for web, print, and mobile.
- - Identify and manipulate elements of the InDesign interface.
- - Navigate, organize, and customize the application workspace.
- - Navigate a document.
- - Use rulers, grids, guides, views, and modes to work efficiently.

#### ***Unit: AID Module 04: Project Setup and Interface Part II***

##### Learning Objectives:

- - Import assets into a project.
- - Manage colors, swatches, and swatch libraries.
- - Create and customize gradients.

#### ***Unit: AID Module 05: Organizing Documents***

##### Learning Objectives:

- - Use the Layers panel to modify layers.
- - Employ best practices to effectively manage multiple layers and complex projects.
- - Modify layer visibility and printability.
- - Create pages in a document.
- - Edit and customize pages.

#### ***Unit: AID Module 06: Creating and Modifying Visual Elements Part I***

##### Learning Objectives:

- - Use core tools and features to lay out visual elements.
- - Use a variety of type tools to add typography to a design.
- - Use appropriate character and paragraph settings in a design.
- - Convert text to graphics and manage text flow across multiple text areas.
- - Use tools to add special characters or content.

#### ***Unit: AID Module 07: Creating and Modifying Visual Elements Part II***

##### Learning Objectives:

- - Make selections using a variety of tools.
- - Modify and refine selections using various methods.

- - Modify frames and frame content.
- - Rotate, flip, and transform individual frames or content.

***Unit: AID Module 08: Creating and Modifying Visual Elements Part III***

Learning Objectives:

- - Use various tools and auto-correction methods to repair project content.
- - Use the Story Editor to edit the text within a project.
- - Use effects to modify images or frames.
- - Create, edit, and save object styles.

***Unit: AID Module 09: Creating and Modifying Visual Elements Part IV***

Learning Objectives:

- - Add interactive elements and behaviors.
- - Demonstrate knowledge of how to embed rich-media objects.
- - Identify and assign triggers for multimedia assets.
- - Create a table to display data.
- - Edit tables and cells.

***Unit: AID Module 10: Publishing Digital Media***

Learning Objectives:

- - Prepare documents for publishing to the web, print, and other digital devices.
- - Save in the native file format for InDesign (.indd).
- - Save in appropriate formats for print or screen.
- - Print proof copies before publishing.
- - Package an InDesign project.
- - Understand the structure and test prep necessary for the ACA InDesign Certification Exam.

***Unit: AID Module 11: Course Wrap-up/Final***

Learning Objectives:

- - Completion

**Adobe Photoshop Certification**

***Unit: APC 00: Module 0 - Start Here***

Learning Objectives:

- - Completion

***Unit: APC 01: Working in the Design Industry Part I***

## Learning Objectives:

- - Understand the Adobe Creative Cloud and the role of the various applications
- - Determine whether the content is relevant to the purpose, audience, and audience needs
- - Demonstrate knowledge of techniques for communicating about design plans with peers and clients
- - Demonstrate knowledge of basic project management concepts
- - Identify legal and ethical considerations for using third-party content, such as copyright, permissions, and licensing
- - Identify when and how to obtain permission to use images of people and locations

***Unit: APC 02: Working in the Design Industry Part II***

## Learning Objectives:

- - Demonstrate knowledge of digital image terminology
- - Demonstrate knowledge of how color is created in digital images
- - Communicate visually using the elements and principles of design and common design techniques
- - Identify and use common typographic adjustments to create contrast, hierarchy, and enhanced readability/legibility
- - Demonstrate knowledge of common photographic/cinematic composition terms and principles

***Unit: APC 03: Project Setup and Interface Part I***

## Learning Objectives:

- - Set appropriate document settings for printed and onscreen images
- - Create a new document preset to reuse for specific project needs
- - Identify and manipulate elements of the Photoshop interface
- - Organize and customize the workspace
- - Configure application preferences

***Unit: APC 04: Project Setup and Interface Part II***

## Learning Objectives:

- - Navigate a document
- - Use rulers
- - Use guides and grids
- - Open or import images from various devices



- - Place assets in a Photoshop document and use the Adobe Camera Raw interface to process images

#### ***Unit: APC 05: Project Setup and Interface Part III***

Learning Objectives:

- - Set the active foreground and background color
- - Create and customize gradients
- - Create and edit swatches
- - Open and browse libraries of included brushes, symbols, graphic styles, and patterns
- - Create and edit brushes, symbols, styles, and patterns

#### ***Unit: APC 06: Organizing Documents Part I***

Learning Objectives:

- - Use the Layers panel to modify layers
- - Manage layers in a complex project
- - Work with multiple layers
- - Flatten and merge layers
- - Recognize the different types of layers in the Layers panel

#### ***Unit: APC 07: Organizing Documents Part II***

Learning Objectives:

- - Adjust a layer's opacity, blending mode, and fill opacity
- - Create, apply, and manipulate masks
- - Nondestructive editing: Smart Objects, Smart Filters, and adjustment layers
- - Destructive editing: painting, adjustments, erasing, and rasterizing
- - Organize a document based on various specifications

#### ***Unit: APC 08: Creating and Modifying Visual Elements Part I***

Learning Objectives:

- - Create images using a variety of tools
- - Modify and edit vector images using a variety of vector tools
- - Use type tools to add typography to a design
- - Adjust character settings in a design
- - Adjust paragraph settings in a design, and convert text to graphics

#### ***Unit: APC 09: Creating and Modifying Visual Elements Part II***

Learning Objectives:

- - Make selections using a variety of tools

- - Modify and refine selections using various methods and save and load selections
- - Modify the canvas or artboards
- - Rotate, flip, and modify individual layers, objects, selections, groups, or graphical elements
- - Apply basic auto-correction methods and tools

#### ***Unit: APC 10: Creating and Modifying Visual Elements Part III***

Learning Objectives:

- - Use various tools to repair and reconstruct images
- - Evaluate or adjust the appearance of objects, selections, or layers using various tools
- - Apply photographic changes to images using tools and adjustments
- - Use filters to modify images destructively or non-destructively
- - Apply, modify, copy, and remove layer styles as well as create, manage, and save custom layer styles

#### ***Unit: APC 11: Publishing Digital Media***

Learning Objectives:

- - Check the document for errors and project specifications.
- - Save in the native file format for Photoshop (.psd).
- - Save documents in appropriate image formats for print or screen.
- - Export project elements.
- - Understand the structure and test prep necessary for the ACA Photoshop Certification Exam.

#### ***Unit: APC 12: Course Wrap-up/Final Exam***

Learning Objectives:

- - Completion

#### **Adobe Premiere Certification**

#### ***Unit: APC 01: Working in the Video Industry Part I***

Learning Objectives:

- - Identify the purpose, audience, and audience needs for preparing images and determine whether the content is relevant to the purpose, audience, and audience needs.
- - Communicate with colleagues and clients about design plans demonstrating knowledge of techniques for communicating about design plans with peers and clients.
- - Demonstrate knowledge of basic project management concepts.

- - Determine the type of copyright, permissions, and licensing required to use specific content identifying legal and ethical considerations for using third-party content, such as copyright, permissions, and licensing.

#### *Unit: APC 02: Working in the Video Industry Part II*

##### Learning Objectives:

- - Demonstrate knowledge of key terminology related to digital audio, digital video, and video/audio production.
- - Demonstrate knowledge of how color is managed in digital video.
- - Communicate visually using design principles and standard film/video techniques.
- - Identify general design principles and guidelines for editing video.
- - Define common photographic and cinematic composition terms and principles and give examples of when and why to use types of shots.

#### *Unit: APC 03: Project Setup and Interface*

##### Learning Objectives:

- - Set appropriate project settings for video and identify and manipulate elements of the Premiere Pro interface.
- - Navigate, organize, and customize the application workspace and configure application preferences.
- - Import assets into a project, import media from various sources, and manage assets in a Premiere Pro project.
- - Create a sequence that matches the project requirements.
- - Use non-visible design tools in the interface to aid in video workflow including navigating a project, timeline markers, and guides.

#### *Unit: APC 07: Publishing Digital Media*

##### Learning Objectives:

- - Check a project for errors and project specifications.
- - Export and archive video and audio sequences including exporting a clip, range of frames, a single frame, or an entire sequence.
- - Export using the Adobe Media Encoder.
- - Archive a project.
- - Understand the structure and test prep necessary for the Adobe Certified Professional credential.

#### *Unit: APC 04: Organizing, Creating and Modifying Visual Elements Part I*

##### Learning Objectives:

- - Use the Timeline panel to manage video and audio tracks.
- - Modify basic track visibility and audio levels.
- - Create a video rough-cut using a variety of tools and panels.
- - Manage sequences in a complex project.
- - Place images and video into a sequence.

***Unit: APC 05: Organizing, Creating and Modifying Visual Elements Part II***

Learning Objectives:

- - Add and animate titles and modify title properties including creating superimposed text and shapes in a video sequence, using appropriate character and paragraph settings in a title, and animating title elements.
- - Trim footage for use in sequences including resizing clips using a variety of tools.
- - Modify and refine clip trims using various methods.
- - Modify clip settings and change the speed or direction of a video clip.
- - Adjust the audio of a video clip.

***Unit: APC 06: Organizing, Creating and Modifying Visual Elements Part III***

Learning Objectives:

- - Use basic editing techniques and effect presets to manipulate digital audio and video including auto-correction methods and tools and audio and video effects presets.
- - Apply and adjust effects presets on multiple clips in separate tracks by using adjustment layers.
- - Use Effect Controls to modify video in a sequence including modifying video effect settings.
- - Apply and adjust video motion effects and composite video tracks.
- - Manage audio in a video sequence including adding audio to a sequence and adjusting the audio on the timeline or using the Effect Controls panel.

***Unit: APC 08: Final Exam***

Learning Objectives:

- - Completion

## Business Management & Administration

### GoSkills

#### Introduction to Sales

##### *Unit: Be an Expert*

Learning Objectives:

- - Understand Be an Expert in Your Industry
- - Understand Be an Expert in Your Product or Service
- - Understand C.C.D. – Clear and Concise Description

##### *Unit: The Presentation*

Learning Objectives:

- - Understand The Introduction
- - Understand Address Your Prospect's Needs
- - Understand Features and Benefits

##### *Unit: Master Your Psychology*

Learning Objectives:

- - Understand Master Your Belief in Your Company
- - Understand Master Your Belief in Yourself
- - Understand Master Your Attitude
- - Understand Master Your Beliefs, Attitude and Emotions - Mind Reset
- - Understand Master Your Beliefs, Attitude and Emotions - Mind Hack
- - Understand Master Your Beliefs, Attitude and Emotions - Mind Cleanse

##### *Unit: Get Connected*

Learning Objectives:

- - Create an Ideal Client List
- - Research Your Ideal Client
- - Reach Out

##### *Unit: The Follow Up*

Learning Objectives:

- - Understand Phone Call Follow Up
- - Understand Phone Call Follow Up 2 - Customer Care Call
- - Understand Email Follow Up

- - Understand Email Follow Up 2 – Customer Care Email
- - Understand Mail Follow Up

#### ***Unit: Get Personal***

Learning Objectives:

- - Understand The Captain
- - Understand The Inspiration
- - Understand The Status Quo
- - Understand The Analyst

#### ***Unit: The Horatio Effect***

Learning Objectives:

- - Understand Expansive Questions
- - Understand Narrow Questions
- - Understand In Their Own Words
- - Understand Hurts So Good

#### ***Unit: Solidify the Relationship***

Learning Objectives:

- - Understand Re-Cap
- - Understand Move Forward
- - Understand Satisfy Emotional and Logical Reasons to Buy

#### ***Unit: Intro to Sales: Final Exam***

Learning Objectives:

- - Completion

### **Project Management Basics**

#### ***Unit: Project Management Context***

Learning Objectives:

- - Understand the phases of a project lifecycle and know how to approach a predictive project versus an adaptive project

#### ***Unit: Planning***

Learning Objectives:

- - Understand what is normally shown in a project budget
- - Understand the difference between positive and negative risk

- - Understand when and how to use a Gantt chart on a project

#### ***Unit: Execution***

Learning Objectives:

- - Understand the stages of a team building lifecycle
- - Use a project dashboard to communicate project status with both management and your project team
- - Understand how to gain stakeholder acceptance during project closeout

#### ***Unit: Project Management Basics: Final Test***

Learning Objectives:

- - Completion

#### **Public Speaking**

#### ***Unit: Conclusion***

Learning Objectives:

- - Continuously improve my public speaking skills

#### ***Unit: Public Speaking Mechanics***

Learning Objectives:

- - Overcome my nerves and get my message across clearly
- - Positively interact with my audience
- - Manage a disruptive audience member

#### ***Unit: Creating Your Presentation***

Learning Objectives:

- - Write a speech using relevant examples to illustrate your points

#### ***Unit: PowerPoint Presentations***

Learning Objectives:

- - Deliver a successful presentation for work, school or personal interest

#### ***Unit: How to Tell Stories***

Learning Objectives:

- - Deliver a speech that commands my audience's attention

***Unit: Public Speaking: Final Exam***

Learning Objectives:

- - Completion

**Team Leadership*****Unit: Team Communication***

Learning Objectives:

- - Supervise team meetings, negotiations and decision making.

***Unit: Team Leadership: Final Exam***

Learning Objectives:

- - Completion

***Unit: Team Dysfunctions***

Learning Objectives:

- - Apply problem solving techniques to resolve team dysfunction.

***Unit: Business Teams***

Learning Objectives:

- - Distinguish between business groups and teams.

***Unit: Team Processes***

Learning Objectives:

- - Identify the roles and responsibilities of team members.
- - Plan team building and oversee team goal setting.
- - Track performance, accountability and time management.

***Unit: Decision Making and Conflict Resolution***

Learning Objectives:

- - Apply problem solving techniques to resolve team conflicts.

**Open Textbooks****Building Relationships With Business Communication*****Unit: BRBC01: Developing Business Relationships***

Learning Objectives:



- - Explain the benefits of effective workplace communication.
- - Outline ethical responsibilities in business communication.
- - Identify personal and social factors affecting communication.
- - Determine message purpose and objectives.
- - Select appropriate message channels and formats.

***Unit: BRBC02: Essential Tools of Business Communication***

Learning Objectives:

- - Identify and apply Aristotle's rhetorical elements of logos, ethos, and pathos,
- - Develop skills in rhetorical listening,
- - Identify and apply techniques of visual rhetoric,
- - Apply the cognate strategies in oral and written communication,
- - Identify reliable sources, and use fact-checking strategies on online sources.

***Unit: BRBC03: Presentations***

Learning Objectives:

- - Manage speech anxiety effectively.
- - Choose the right delivery method for specific purposes.
- - Establish audience connections through storytelling.
- - Deliver appropriate Land Acknowledgements.
- - Select suitable organizational patterns for presentations.

***Unit: BRBC04: Communicating in Writing***

Learning Objectives:

- - Identify the qualities of good business writing,
- - Distinguish between formal and informal writing styles,
- - Create routine and informational email messages,
- - Format memos and letters appropriately, and
- - Organize and format a formal recommendation report.

***Unit: BRBC05: APA Style Referencing***

Learning Objectives:

- - Explain why using citations is important
- - Create and format reference list citations in APA Style
- - Identify two ways to insert a citation
- - Create and format in-text citations in APA Style

## Business Mathematics

### *Unit: BM00: Introduction*

Learning Objectives:

- - Completion

### *Unit: BM01: Business Applications of Basic Mathematics*

Learning Objectives:

- - Understand the concept of ratios and their relevance in business, including how to calculate and interpret them
- - Explore proportions and their application in various business scenarios, learning how to set up and solve proportion problems
- - Grasp the concept of rates with more than two quantities and how to use them in practical business contexts, such as calculating unit prices

### *Unit: BM02: Functions and Applications*

Learning Objectives:

- - Define functions and their significance in business applications, including recognizing linear functions and understanding their properties
- - Explore cost functions and their role in cost analysis for businesses, learning how to set up and work with cost equations
- - Master solving systems of equations and their application in solving real-world business problems, such as finding the intersection point of supply and demand curves

### *Unit: BM03: Simple Interest*

Learning Objectives:

- - Comprehend the concept of simple interest and its calculation, including understanding the relationship between principal, rate, and time
- - Explore the time value of money and its implications for business decisions, including calculating future values and present values
- - Understand the concept of equations of value and how they can be used in solving practical business problems related to loans and investments

### *Unit: BM04: Compound Interest*

Learning Objectives:

- - Gain insight into compound interest, including nominal and periodic rates, and understand how it differs from simple interest

- - Master the compound interest formula and its application in calculating the future value of investments or loans
- - Explore advanced concepts related to compound interest, including handling multiple cash flows and understanding equivalent and effective rates

#### ***Unit: BM05: Annuities***

##### Learning Objectives:

- - Understand the concept of annuities, including how they apply to savings accounts, loans, and other financial instruments
- - Explore different types of annuities, such as deferred annuities and perpetuities, and their use in various financial scenarios
- - Grasp the principles of mortgages, including the 32% rule and bi-weekly payments, and learn how to make informed decisions regarding lump sum payments and refinancing

#### ***Unit: BM06: Investment Decisions***

##### Learning Objectives:

- - Evaluate business plans and investment opportunities, considering factors like rate of return and net present value to make informed investment decisions
- - Master the use of financial tools like the BAII Plus calculator to analyze cash flows and calculate internal rates of return and payback periods
- - Understand how different lifetimes and cost comparisons impact investment decisions, enabling you to assess the financial feasibility of various projects

#### ***Unit: BM07: Extra Problems***

##### Learning Objectives:

- - Completion

#### ***Unit: BM08: Appendices***

##### Learning Objectives:

- - Completion

### **The Math of Money**

#### ***Unit: TMM01: The Math of Money***

##### Learning Objectives:

- - Understand the fundamentals of the macroeconomy, including its components and how they impact financial decisions

- - Acquire essential financial terminology and concepts necessary for discussing and analyzing financial matters
- - Master the fundamentals of balance sheets and their significance in evaluating financial health and making financial decisions

#### ***Unit: TMM02: Debt***

##### Learning Objectives:

- - Explore the world of credit cards and understand their mechanics, benefits, and potential pitfalls
- - Examine different aspects of automobile financing and grasp the key factors to consider when financing a car
- - Dive into the complexities of mortgages, including terminology and calculations involved in mortgage loans

#### ***Unit: TMM03: Investing and Retirement***

##### Learning Objectives:

- - Gain insights into the basics of investment, including various investment vehicles and their risk-return profiles
- - Explore the world of stocks, bonds, and mutual funds, understanding how they function and their roles in investment portfolios
- - Develop a comprehensive understanding of retirement planning, including the importance of saving, investment strategies, and types of retirement accounts

#### ***Unit: TMM04: Taxes***

##### Learning Objectives:

- - Examine non-income taxes, such as property taxes and sales taxes, and understand their impact on personal finances
- - Delve into income tax terminology and forms, learning to navigate the complexities of income tax regulations
- - Solve income tax problems, applying tax rules to real-life scenarios and understanding the implications of various tax strategies

#### ***Unit: TMM05: Insurance***

##### Learning Objectives:

- - Explore different types of insurance, including health insurance, property insurances, and income insurances, and their roles in managing financial risks
- - Master the concepts and terminologies related to insurance policies and coverage, enabling effective decision-making in insurance matters

## Pointful Education

### Communication Skills for Business

#### *Unit: Communication Skills for Business 00*

No Learning Objectives available.

#### *Unit: Communication Skills for Business 01: Basic Communication Principles*

Learning Objectives:

- - Differentiate between professional and unprofessional communication and behaviors (including recognizing professional email addresses)
- - Cultivate an appropriate social media presence (including profile information, posts, photos, and videos)
- - Describe professional time management skills (including punctuality, attendance, and notification)
- - Identify basic delivery standards (including facing the audience or speaker, making eye contact, and communicating messages or feedback through nonverbal methods)
- - Moderate intonation, rate tone, volume, enunciation; keeping attention on the message and deferring judgment

#### *Unit: Communication Skills for Business 02: Effective Communication Strategies Part I*

Learning Objectives:

- - Analyze the effect of the audience on how messaging is delivered (including identifying audience data required to craft an effective message, analyzing audience demographics like age, education, gender, marital status, race, religion, and other statistical population factors)
- - Analyze the effect of the environment on a message (including in-person vs remote, audience size, room size, and available equipment)
- - Identify the purpose of a communication scenario (including primary message to be delivered)
- - Differentiate between informative, persuasive, and motivational messages
- - Distinguish between ethical, emotional, and logical persuasion

#### *Unit: Communication Skills for Business 03: Effective Communication Strategies Part II*

Learning Objectives:

- - Address legal and ethical issues in a communication scenario, including: Defining and analyzing accessibility issues (including ensuring that presentations and documents comply with accessibility standards), Attribution, Bias-free communication (and identifying biased communication terminology), Confidentiality (including removing

personal data from presentations and documents), Copyright, trademarks, and plagiarism, Responding to requests for data

- - Select the most appropriate medium for the communication to be given
- - Define and differentiate between face-to-face discussions, phone calls, voice messages, and written messages (including emails, text messages, business letters, job applications, resumes, and meeting agendas/meeting minutes)
- - Identify various visual messaging methods such as PowerPoint presentations, videos, and business-related social media messages using platforms like Instagram, Facebook, LinkedIn, and X (formerly Twitter)
- - Outline and summarize your message effectively (including creating and completing a concise outline, outlining messages, and summarizing the planned messages)

***Unit: Communication Skills for Business 05: Best Practices for Creating Business Deliverables  
Part II***

Learning Objectives:

- - Identify design principles of business communications, including: Balance, Proximity, Alignment, Repetition, Contrast, Space, Rule of thirds, Color choice and white space.
- - Distinguish between effective and ineffective visual design for business communications (including presentation slides, emails, and documents)
- - Identify effective uses of data visualization to present complex information
- - Distinguish and determine the appropriateness of using elements like graphs, charts, plots, and infographics
- - Determine the best way to interpret the message of a data visualization graphic

***Unit: Communication Skills for Business 04: Best Practices for Creating Business Deliverables  
Part I***

Learning Objectives:

- - Assemble accurate business communication deliverables
- - Create business communications such as business letters, meeting agendas, meeting minutes, and resumes from components
- - Analyze the effectiveness of different forms of business communications using spelling and grammar tools
- - Apply visual design standards to business communications

***Unit: Communication Skills for Business 06: Delivering the Message***

Learning Objectives:

- - Describe the variables involved in delivering an effective message
- - Identify personal presentation elements like attire and hygiene

- - Understand how environmental variables like location, physical space, technology, and formality can affect the message delivery
- - Evaluate issues like regional language variations, imprecise language, jargon, context, and perceptions when delivering the message
- - Identify methods of adapting messages based on audience feedback (including direct feedback and indirect feedback like body language)

***Unit: Communication Skills for Business 07: Receiving Communications***

Learning Objectives:

- - Restate the key points of a given message in business communication
- - Identify the primary goal of verbal communication and summarize it
- - Identify the primary goal of written communication and summarize it
- - Identify appropriate responses and clarifying questions for a business message

***Unit: Communication Skills for Business 08: Analyzing Communication Scenarios***

Learning Objectives:

- - Analyze the important factors of obtaining employment (including identifying common mistakes made by interviewers and applicants, and distinguishing between appropriate and inappropriate job application documents)
- - Analyze expressions of and responses to feedback (including giving constructive criticism, receiving constructive criticism, seeking feedback, setting and clarifying expectations, and modeling correct behavior as a feedback mechanism)
- - Analyze communication etiquette within a business hierarchy, which can include communicating with supervisors, peers, subordinates, and group collaboration
- - Identify the problem, solution, and appropriate action(s) of a customer service request
- - Define and restate the customer problem, identify the solution the customer desires and available solutions, and interface with team members and customers

***Unit: Communication Skills for Business 09: Course Wrap-up/Final Exam***

No Learning Objectives available.

**Entrepreneurship and Small Business Certification**

***Unit: ESB 00: Module 0 - Start Here***

Learning Objectives:

- - Completion

***Unit: ESB 01: The Entrepreneur***

Learning Objectives:

- - Identify the characteristics of entrepreneurs
- - Describe a self-assessment outcome and identify the strengths, weaknesses, and risk tolerance identified in a self-assessment
- - Describe how to compensate weaknesses of a self-assessment with services and other resources
- - Recognize a business opportunity
- - Identify the risks, benefits, opportunities, and drawbacks of being an entrepreneur

#### ***Unit: ESB 02: Opportunity Recognition***

Learning Objectives:

- - Identify the benefits and drawbacks of different types of opportunities (e.g., start a new business, buy an existing business, and buy a franchise)
- - Analyze the demand for the goods or service
- - Analyze opportunities in an environment and market
- - Identify the customers or potential customers for a business
- - Recognize a value proposition

#### ***Unit: ESB 03: Starting a Business Part I***

Learning Objectives:

- - Identify the purposes and value of a business plan
- - Identify the appropriate legal structure, benefits, and drawbacks for different legal structures for a business
- - Given a scenario, identify different types of licenses and regulations that are required
- - Identify the benefits and drawbacks of various sources of startup funding: Equity (friends/family, angels, venture), Debt (bank, credit cards, personal loans), and Grants (government, foundation, corporate)

#### ***Unit: ESB 04: Starting a Business Part II***

Learning Objectives:

- - Given a scenario, identify support that is available for the business on a local, state, and federal level
- - Identify the ethical practices of a business
- - Identify the social responsibilities of a business
- - Identify potential exit strategies for a business

#### ***Unit: ESB 05: Business Operations Part I***

Learning Objectives:



- - Given a scenario, identify support that is available for the business on a local, state, and federal level
- - Determine whether work can be completed by the owner or whether employees or service providers are needed
- - Identify the taxes that are required to be paid by a business
- - Identify intellectual property issues of trademarks, copyrights, and patents

#### ***Unit: ESB 06: Business Operations Part II***

Learning Objectives:

- - Identify standard operating procedures (e.g., setup, conduct, internal controls, separation of duties)
- - Identify a supply chain (e.g., clear commitments, active communication, negotiated costs)
- - Identify the factors that lead to sustainability
- - Identify milestones as part of a growth strategy

#### ***Unit: ESB 07: Marketing and Sales***

Learning Objectives:

- - Develop a sales strategy and identify the characteristics of a successful sale
- - Identify and analyze the costs/benefits of finding customers
- - Identify how to retain customers and develop a relationship with repeat customers
- - Determine value and methods of communication through traditional media, including brochures and advertising
- - Determine value and methods of communication through digital media, including websites and social media

#### ***Unit: ESB 08: Financial Management Part I***

Learning Objectives:

- - Interpret basic financial statements such as income statements and balance sheets
- - Identify the factors that influence credit ratings and the importance of a positive credit rating
- - Given a list of expenses, identify which are fixed versus variable
- - Identify the factors that impact the price to the customer

#### ***Unit: ESB 09: Financial Management Part II***

Learning Objectives:

- - Identify and analyze cash flow including accounts receivable and inventory
- - Identify and analyze cash flow including accounts payable and debt

- - Create a cash flow budget
- - Identify the breakeven point for the business

***Unit: ESB 10: Course Wrap-up/Final Exam***

Learning Objectives:

- - Completion

**Project Management**

***Unit: ProjMgmt 01: Introduction to Project Management***

Learning Objectives:

- - Define a project, product, program, and portfolio.
- - Define project management, a business case, project scope, and deliverables.
- - Define a milestone and task
- - List components of a project and a business case.
- - Define issues, risks, assumptions, and constraints.

***Unit: ProjMgmt 02: Project Management Planning Part I***

Learning Objectives:

- - Identify features of traditional plan-based delivery and agile delivery.
- - Identify project management ethics (refer to PMI code of ethics).
- - Identify concepts of a project management plan (e.g., cost, quality, risk, schedule, etc.).
- - Define the different types of resources (e.g., human and material).
- - Identify common terminology in business concepts related to project management (e.g., change management, culture, strategy, governance, trade-off, performance metrics, prioritization, categorization, work breakdown, reporting, conflict, accuracy vs. precision, leadership, and motivation, etc.).

***Unit: ProjMgmt 03: Project Management Planning Part II***

Learning Objectives:

- - Identify the features of different organizational environments (e.g., co-location and virtual teams, decentralized and centralized organization, and organizational structures [functional, matrix, projectized]).
- - Identify leadership and management.
- - Describe organizational structures (e.g., co-location and virtual teams, decentralized and centralized organization, and organizational structures [functional, matrix, projectized]).
- - Identify benefits and concepts associated with risk register and the stakeholder register.

- - Define the key stakeholder roles such as project managers, sponsors, team leaders, team members, project clients, etc.
- - Define the key stakeholder responsibilities such as project managers, sponsors, team leaders, team members, project clients, etc.

#### ***Unit: ProjMgmt 06: Executing and Controlling Traditional Plan-Based Projects***

Learning Objectives:

- - List the types of dependencies (e.g., sequence, start to start, finish to start, etc.).
- - Define project management, a business case, project scope, and deliverables.
- - Define a critical path.
- - Describe the project controls in traditional plan-based projects (e.g., earned value, baselines, etc.).

#### ***Unit: ProjMgmt 04: Tools and Systems***

Learning Objectives:

- - Identify the typical tools used for creating a project schedule.
- - Define the characteristics and benefits of various project management tools.
- - Define common information gathering tools or techniques.
- - Describe the components of an effective meeting.

#### ***Unit: ProjMgmt 05: Traditional Plan-Based Methodologies and Scheduling***

Learning Objectives:

- - Identify the primary rationale for traditional plan-based projects and the process groups and knowledge areas (e.g., cost, quality, risk, schedule, etc.).
- - Identify project phases and the correct order of the phases.
- - Define a typical project structure for a traditional plan-based approach.
- - Identify the steps to create a schedule.
- - Define a work breakdown structure.

#### ***Unit: ProjMgmt 07: Agile Projects Part I***

Learning Objectives:

- - Identify the primary rationale for agile and traditional plan based projects.
- - Identify the key tenants/principles of agile.
- - Recognize hybridization.
- - Define the use of transparency in Agile projects.
- - Describe the principle of Servant Leadership.

#### ***Unit: ProjMgmt 08: Agile Projects Part II***

Learning Objectives:

- - Identify common agile methodologies.
- - State the components of agile sequencing.
- - Identify the factors/inputs for determining the framework (e.g., time, scope, etc.).
- - Identify agile project progress metrics.
- - State the importance of agile project tracking.

#### ***Unit: ProjMgmt 09: Agile Projects Part III***

Learning Objectives:

- - Define the role of the agile project member.
- - Identify good team principles in agile project management.
- - Identify examples of team collaboration in agile project management.
- - Describe the project controls in agile projects.
- - Define the role of the agile project lead.

#### ***Unit: ProjMgmt 10: Agile Projects Part IV***

Learning Objectives:

- - Describe the task decomposition process in an agile project management
- - Describe the task prioritization process in an agile project management
- - Identify monitor and controlling techniques in agile projects
- - Identify the components of a specific agile plan (e.g., Scrum, XP, Scaled Agile Framework, Kanban, etc.)

#### ***Unit: ProjMgmt 11: Business Analysis Roles and Responsibilities***

Learning Objectives:

- - List critical/core stakeholder roles and responsibilities (e.g., business analysts, business sponsor, process owner, product manager, product owner, etc.).
- - Define types of roles (internal vs external).
- - List elements in a communication plan and identify communication channels/tools.
- - List types of requirements (e.g., functional, nonfunctional, stakeholder, security, solution, business, migrating, market research, bench marking, etc.).
- - List ways of gathering requirements and tools used for capturing requirements (e.g., use case, user stories, process diagrams, etc.).
- - Define requirements traceability matrix/product backlog.

#### ***Unit: ProjMgmt 12: Product Roadmap***

Learning Objectives:

- - Define what a product roadmap is
- - List product roadmap components

- - Define a release plan
- - Identify components of product delivery
- - Define components of project/product acceptance (e.g., requirements traceability matrix/product backlog, Transition Plan, etc.)

***Unit: ProjMgmt 13: Course Wrap-up/Final Exam***

Learning Objectives:

- - Completion

***Unit: ProjMgmt 00: Start Here***

Learning Objectives:

- - Completion

**Startups and Innovation**

***Unit: Module 00: Startups and Innovations Course Intro***

Learning Objectives:

- - Completion

***Unit: Module 01: Introduction to Entrepreneurship and Startups***

Learning Objectives:

- - Discuss the history of entrepreneurship and startups in the U.S.
- - Define entrepreneurship and describe an entrepreneurial mindset
- - Evaluate the benefits of entrepreneurship and startups as a career path, as well as common mistakes and misconceptions
- - Examine employment opportunities in entrepreneurship to consider entrepreneurship as an option for career planning
- - Outline the topics that will be covered throughout this course (startups, innovation, competition, team-building)

***Unit: Module 02: MVP and Product Market Fit***

Learning Objectives:

- - Employ entrepreneurial discovery strategies to generate feasible ideas for business ventures
- - Describe what a minimum viable product (MVP) is and provide examples
- - Define product/market fit and evaluate different ways for evaluating product/market fit of a business idea
- - Evaluate the startup scooter company Lime and describe its product/market fit

***Unit: Module 03: Business Models***

Learning Objectives:

- - Differentiate between products, services, and platforms
- - Define key business model terms such as B2B, B2C, and others
- - Outline the various industries that exist in the U.S. and global economies
- - Describe the opportunities for entrepreneurship in a given industry
- - Compare service platforms that are common for startups (SaaS, IaaS, BaaS, PaaS, etc.)
- - Evaluate the history of the startup Airbnb and describe how it created a new and unique platform

***Unit: Module 04: Competition***

Learning Objectives:

- - Define differentiation and discuss the importance of differentiating yourself as a startup
- - Describe tools and methods used to analyze competitors and competing products/solutions
- - Examine the advantages that startups have over larger competitors
- - Conduct market research on a chosen industry
- - Evaluate the history and competition between Facebook and MySpace

***Unit: Module 05: Disruptive Innovation***

Learning Objectives:

- - Describe innovation and provide examples of innovative ideas and products
- - Examine why startups can be better at innovation than established companies
- - Outline the theory of disruptive innovation
- - Compare the tradeoff between quality and price in products
- - Evaluate the history of the startup Netflix and how it evolved; describe how it exhibited disruptive innovation

***Unit: Module 06: Building a Team***

Learning Objectives:

- - Define what a co-founding team is and describe the typical roles and responsibilities of key founding members (CEO, CTO, Product, support, CFO, CMO, Sales, board/advisors)
- - Describe ways of researching and networking to find and build a co-founding team
- - Understand the methods that businesses use to recruit, train, and develop human resources
- - Outline the components of a company's culture and describe ways as the founder to create and foster a startup's culture

- - Evaluate the company Coinbase and describe its challenges in building a team to meet its growth

#### ***Unit: Module 07: Marketing a Startup***

Learning Objectives:

- - Describe the strategies for marketing a startup on a limited budget
- - Compare the challenges of marketing a startup versus marketing established products
- - Describe social media and online marketing
- - Acquire information to guide business decision-making
- - Evaluate the startup company Spotify and describe how it used marketing strategies to grow its business

#### ***Unit: Module 08: Writing a Pitch Deck***

Learning Objectives:

- - Describe the strategies for Describe the key components of a startup pitch deck (problem/solution, vision, timing)marketing a startup on a limited budget
- - Describe the key components of a startup pitch deck (financials, total addressable market, competition, uses of funds)
- - Identify and define the key numbers and terms that an investor will expect in a pitch deck
- - Create a pitch deck of a fictional company
- - Evaluate the pitch deck of the asteroid mining company Deep Space Industries

#### ***Unit: Module 09: Raising Capital***

Learning Objectives:

- - Evaluate the pros and cons of traditional sources of funding for a startup, including self-funding, family/friends, loans, venture capital)
- - Discuss relatively newer forms of raising capital, such as incubators, accelerators, and crowdfunding
- - Define key terms related to raising capital for a startup (valuation, pre/post-money, series A, B, C, rounds)
- - Describe the challenges and opportunities of working with a venture capital investor
- - Evaluate the company VIPKid and its multiple rounds of fundraising

#### ***Unit: Module 10: Possibilities and Opportunities***

Learning Objectives:

- - Describe social/impact/non-profit entrepreneurship and ventures

- - Differentiate between the serial entrepreneur and the entrepreneur focused on building a lifetime company
- - Select a harvesting strategy that matches the entrepreneur's desired goals regarding the business venture
- - Re-evaluate career possibilities as an entrepreneur and working within a startup vs. a large company
- - Examine the history of Amazon and its growth from a startup to a global technology giant

***Unit: Module 11: Startups and Innovation Final Exam and Self-Assessment***

Learning Objectives:

- - Completion

## **Career Readiness and Career Exploration**

### **CenterPoint Education**

#### **CenterPoint TABE Diagnostics**

***Unit: TABE Aligned Diagnostics***

Learning Objectives:

- - Completion

### **GoSkills**

#### **Body Language**

***Unit: Introduction to Body Language for Business***

Learning Objectives:

- - Come across as confident and self-assured in business situations

***Unit: Start to Improve Your Body Language***

Learning Objectives:

- - Use body language to communicate effectively in meetings and networking situations.

***Unit: Appearances Matter***

Learning Objectives:



- - Appear poised and relaxed while meeting with clients, attending an event or interacting with customers and colleagues

***Unit: Getting in Front of People***

Learning Objectives:

- - Use body language to communicate effectively in meetings and networking situations

***Unit: The Toughest Situations: Presentations and Media Interviews***

Learning Objectives:

- - Deliver a speech and media interview

***Unit: Ensuring Your Future Success***

Learning Objectives:

- - Communicate clearly and skillfully in any industry or walk of life

***Unit: Body Language: Badge Test***

Learning Objectives:

- - Completion

**Public Speaking**

***Unit: Conclusion***

Learning Objectives:

- - Continuously improve my public speaking skills

***Unit: Public Speaking Mechanics***

Learning Objectives:

- - Overcome my nerves and get my message across clearly
- - Positively interact with my audience
- - Manage a disruptive audience member

***Unit: Creating Your Presentation***

Learning Objectives:

- - Write a speech using relevant examples to illustrate your points

***Unit: PowerPoint Presentations***

Learning Objectives:

- - Deliver a successful presentation for work, school or personal interest

#### *Unit: How to Tell Stories*

Learning Objectives:

- - Deliver a speech that commands my audience's attention

#### *Unit: Public Speaking: Final Exam*

Learning Objectives:

- - Completion

### **Indigo Project**

#### **Indigo Pathway Survey**

#### *Unit: Indigo Pathway Survey*

Learning Objectives:

- - I successfully completed my Indigo Pathway Survey and can access my results.
- - I can find the Results Summary section of my Indigo report and can explain the job strategy based on my results.
- - I can analyze my individual goals and interests and explain how my Top Two motivators show up in my life.
- - I can find my DISC Profile on my Indigo report and can describe how my DISC scores influence my talents, abilities, and skills.
- - I have researched potential careers and can name a career path that aligns with my personal interests and goals.
- - I understand how my communication style may affect my relationships and could impact my career and employability skills.
- - I have completed my reflection questions and can discuss my thinking with a friend.
- - Analyze individual goals and interests
- - Determine individual talents, abilities, and skills
- - Develop an individual career plan

### **Lifelong Skills**

#### **Lifelong Soft Skills**

#### *Unit: Lifelong Soft Skills - Communication*

Learning Objectives:

- - Define the three types of communication styles.

- - Describe the five steps to achieve great communication.
- - Identify and explain the three types of listeners.

#### ***Unit: Lifelong Soft Skills - Conflict***

Learning Objectives:

- - Describe conflict management styles.
- - Describe characteristics of people who manage conflict well.
- - Successfully manage conflict.

#### ***Unit: Lifelong Soft Skills - Personal judgment***

Learning Objectives:

- - Define personal judgement.
- - Recognize how personal judgement positively impacts the workplace as a whole.
- - Apply personal judgement to my job.

#### ***Unit: Lifelong Soft Skills - Problem solving***

Learning Objectives:

- - Define problem solving.
- - Recognize how problem solving positively impacts the workplace as a whole.
- - Apply problem solving to my job.

#### ***Unit: Lifelong Soft Skills - Time Management***

Learning Objectives:

- - Define time management.
- - Recognize how time management positively impacts the workplace as a whole.
- - Apply time management to my job.

#### ***Unit: Lifelong Soft Skills - Diversity and Inclusion***

Learning Objectives:

- - Define diversity and inclusion.
- - Recognize how diversity and inclusion positively impacts the workplace as a whole.

#### ***Unit: Lifelong Soft Skills - Self-confidence***

Learning Objectives:

- - Define self-confidence.
- - Recognize how self-confidence positively impacts the workplace as a whole.
- - Apply self-confidence to my job.

***Unit: Lifelong Soft Skills - Teamwork***

Learning Objectives:

- - Define teamwork.
- - Recognize how teamwork positively impacts the workplace as a whole.
- - Apply teamwork to my job.

***Unit: Lifelong Soft Skills - Positive Attitude***

Learning Objectives:

- - Define positive attitude.
- - Recognize how positive attitude positively impacts the workplace as a whole.
- - Apply positive attitude to my job.

***Unit: Lifelong Soft Skills - Initiative***

Learning Objectives:

- - Define initiative.
- - Recognize how initiative positively impacts the workplace as a whole.
- - Apply initiative to my job.

***Unit: Lifelong Soft Skills - Flexibility***

Learning Objectives:

- - Define flexibility.
- - Recognize how flexibility positively impacts the workplace as a whole.
- - Apply flexibility to my job.

***Unit: Lifelong Soft Skills - Work Ethic***

Learning Objectives:

- - Define work ethic
- - Define positive work ethic
- - Understand different work ethic styles

***Unit: Lifelong Soft Skills - Ethical Character***

Learning Objectives:

- - Define ethical character.
- - Recognize how ethical character positively impacts the workplace as a whole.
- - Apply ethical character to my job.

***Unit: Lifelong Soft Skills - Humility***

Learning Objectives:

- - Define humility.
- - Recognize how humility positively impacts the workplace as a whole.
- - Apply humility to my job.

## Open Textbooks

### CESBA Digital Literacy Curriculum

#### *Unit: DLC01: Looking at My Computer*

Learning Objectives:

- - Understand the basics of Looking at My Computer

#### *Unit: DLC02: Looking on the Internet*

Learning Objectives:

- - Understand the basics of Looking on the Internet

#### *Unit: DLC03: How do I print part of a page on a website?*

Learning Objectives:

- - Understand the basics of How do I print part of a page on a website?

#### *Unit: DLC04: Looking at a Website*

Learning Objectives:

- - Understand the basics of Looking at a Website.

#### *Unit: DLC05: Looking for a Job*

Learning Objectives:

- - Understand the basics of Looking for a Job

#### *Unit: DLC06: Learning about Folders and Images*

Learning Objectives:

- - Understand the basics of Learning about Folders and Images

#### *Unit: DLC07: Learning about Email*

Learning Objectives:

- - Understand the basics of Learning about Email

#### *Unit: DLC08: Learning about Places to Use a Computer*

Learning Objectives:

- - Understand the basics of Learning about Places to Use a Computer.

***Unit: DLC09: Learning about Google Maps***

Learning Objectives:

- - Understand the basics of Learning about Google Maps.

***Unit: DLC10: Learning about Facebook***

Learning Objectives:

- - Understand the basics of Learning about Facebook.

***Unit: DLC11: Learning about Smartphones***

Learning Objectives:

- - Understand the basics of Learning about Smartphones

***Unit: DLC12: Learning about Tablets***

Learning Objectives:

- - Understand the basics of Learning about Tablets

***Unit: DLC13: Learning about YouTube***

Learning Objectives:

- - Understand the basics of Learning about YouTube

***Unit: DLC14: Learning about Skype***

Learning Objectives:

- - Understand the basics of Learning about Skype

***Unit: DLC15: Learning about Online Safety***

Learning Objectives:

- - Understand the basics of Learning about Online Safety

***Unit: DLC16: Personal and Private Information Online***

Learning Objectives:

- - Understand the basics of Personal and Private Information Online

***Unit: DLC17: Learning about Microsoft Word (MS Word)***

Learning Objectives:

- - Understand the basics of Learning about Microsoft Word (MS Word)

***Unit: DLC18: Learning about Notepad***

Learning Objectives:

- - Understand the basics of Learning about Notepad

## **Education & Training**

### **Anywhere Anytime**

#### **Creating the Anywhere, Anytime Classroom**

***Unit: Creating the Anywhere, Anytime Classroom***

Learning Objectives:

- - Completion

#### **Delivering Engaging Learning Activities in a DEL Culture**

***Unit: Delivering Engaging Learning Activities in a DEL Culture***

Learning Objectives:

- - Completion

#### **Formative Assessments in a Digital Learning Environment**

***Unit: Formative Assessments in a Digital Learning Environment***

Learning Objectives:

- - Completion

#### **Interventions and Learning Extensions with DEL**

***Unit: Interventions and Learning Extensions with DEL***

Learning Objectives:

- - Completion

#### **The Planning Process and DEL**

***Unit: The Planning Process and DEL***

Learning Objectives:

- - Completion

## Certify ED

### Early Childhood Education (Video & VR)

#### *Unit: Early Childhood Education - Unit Sim*

Learning Objectives:

- - Understand how to create a curriculum web
- - Understand how to create a lesson plan
- - Understand room arrangement

#### *Unit: Early Childhood Education - Career Paths in Early Childhood Education: Opportunities, Roles, and Responsibilities*

Learning Objectives:

- - Identify early childhood education career opportunities that are available with a certificate.
- - Identify early childhood education career opportunities that are available with a degree.
- - Explore and examine opportunities for employment and entrepreneurial endeavors within a variety of early childhood care and education settings.
- - Identify the important role child-caregivers play in the development of each child in care.
- - Examine the NAEYC accreditation standards for early childhood classrooms.
- - Identify methods of compliance with licensing laws and regulations governing child-caregivers.
- - Identify recordkeeping and clerical functions in a childcare setting.
- - Explain the role of a child advocate.
- - Identify the importance and legal mandates of confidentiality in early childhood education.
- - Identify the professional development resources available, and the need for self-assessment for continued professional growth in the early childhood education field.
- - Identify personal characteristics required of an early childhood professional, and the skills and dispositions necessary to communicate and work in a team environment.

#### *Unit: Early Childhood Education - Creating a Safe and Secure Early Childhood Learning Environment*

Learning Objectives:

- - Identify safety hazards in and around the childcare setting.
- - Identify the characteristics of appropriate adult supervision in both indoor and outdoor environments.



- - Instruct children in personal safety awareness.
- - Demonstrate the procedures to follow for accidents, medical emergencies, fire and natural disaster, and environmental alerts.
- - Examine examples of accident and injury reports to understand important components of such reports.
- - Describe safety procedures for arrival and departure, loading and unloading of children from transportation and the appropriate use of child passenger restraints.
- - Examine guidelines that protect the use of children's identity and images on the internet, in social media, and other publication outlets that may be in use in the childcare or learning setting.
- - Investigate the legal issues resulting from a failure to provide a safe environment for children in an early childhood care and education setting.

***Unit: Early Childhood Education - Health and Safety in Early Childhood: Prevention, Identification, and Response***

Learning Objectives:

- - Identify the components of and perform a "10 second health check" for children.
- - Identify characteristics of common childhood illnesses.
- - Describe the three components of the communicable illness process.
- - Identify places where pathogens are commonly found.
- - Describe the five methods of disease transmission.
- - Identify the four stages of an illness.
- - Describe universal/standard precautions and infection control.
- - Demonstrate healthy environment by implementing health and sanitation habits for and with children to limit cross contamination in a childcare or other schooling environment.
- - Examine procedures for maintaining health and vaccination records.
- - Follow and understand how to complete an accident/incident form using established procedures.
- - Review appropriate methods of distributing and review policies for safe storage of medication.

***Unit: Early Childhood Education - Health and Safety in Early Childhood: Promoting Well-being and Protection***

Learning Objectives:

- - Describe when and where disinfectants solutions should be used and safely housed in classrooms.
- - Explain rest and relaxation techniques.

- - Identify the nutritional needs of children infants through school age (birth through age eight).
- - Describe the process, safety factors, and recommended timelines to consider for introducing solid foods to an infant based on guidance from the American Academy of Pediatrics.
- - Plan, prepare, and explain the importance of nutritionally balanced meals and snacks.
- - Describe safe and sanitary food service habits in assisting with mealtime routines.
- - Identify foods that are potentially dangerous for young children to consume.
- - Describe how to encourage positive food choices and good eating habits for toddlers through school-age children.
- - Identify signs of abuse and neglect including conditions that may be in place in environments where abuse may be more likely to occur.
- - Describe characteristics of those who commit abusive acts and characteristics of abused or neglected children.
- - Evaluate how child abuse affects child behavior, health, and the ability to learn and develop.
- - Discuss strategies for supporting the needs of children who have experienced abuse or neglect.
- - Explain the role of the mandated reporter in reporting suspected child abuse.
- - Identify guidelines and procedures for reporting child abuse and neglect.

### *Unit: Early Childhood Education - Observing and Assessing Young Children: A Developmental Approach*

#### Learning Objectives:

- - Describe how major theories of human development provide a basis for planning an environment for developmentally appropriate activities.
- - Explain the stages of cognitive development and how they correlate to social, emotional, and physical development.
- - Identify reasons why practitioners and other support personnel in schools and childcare centers observe young children.
- - Discuss the importance of observing child interactions, children's strengths and weaknesses in and across domains, children's reactions to curriculum implementation, and children's behaviors within the general education classroom.
- - Determine factors in choosing a method of assessment to document children's development and identify the advantages and disadvantages of the different approaches to and methods of observation.
- - Interpret whether that child is developing typically, using data collected on a particular area of that child's development. Explain why that particular assessment approach was the most effective for interpreting this child's development.

***Unit: Early Childhood Education - Cognitive Development in Early Childhood: Building the Foundation for Learning***

Learning Objectives:

- - Describe equipment and activities that promote cognitive development.
- - Examine how a caregiver can plan to meet the social, emotional, physical and cognitive needs of school-age children.
- - Explore how experience influences the brain's wiring and development.
- - Identify the connections between the brain and other areas of child development, such as: physical well-being, attachment, play, consistency, stress, and trauma.
- - Describe the basic processes and timeline of brain development.
- - Analyze the role language and communication plays in the cognitive development in young children.
- - Explain the stages of language acquisition.
- - Explain strategies to encourage expressive and receptive language.
- - Describe the importance of vocabulary development in young children.
- - Describe factors that influence language development.

***Unit: Early Childhood Education - Nurturing Holistic Development: The Power of Story, Literacy, and Physical Play***

Learning Objectives:

- - Describe various methods of story presentation.
- - Evaluate the characteristics of a high-quality children's book using developmentally appropriate guidelines.
- - Describe the importance of reading to children from infancy through childhood.
- - Identify characteristics of a classroom environment that promotes emergent literacy.
- - Describe the stages of physical development.
- - Explain the stages of fine and gross motor development.
- - Recognize the factors that impact physical development.
- - Describe strategies and conditions that encourage physical development
- - Describe the effects of play on children's physical development.
- - Explain how to select and use appropriate equipment and materials which promote physical development.
- - Explain how physical development correlates to social, emotional, and cognitive development.

***Unit: Early Childhood Education - Nurturing Social and Emotional Development: Guiding Young Children's Growth***

Learning Objectives:

- - Describe the social and emotional characteristics of children ages birth to eight.
- - Demonstrate effective, positive guidance techniques for guiding behavior.
- - Describe the stages of social and emotional development of children.
- - Recognize the factors that impact social and emotional development.
- - Discuss caregiving techniques that develop appropriate social skills.
- - Identify positive techniques for conflict resolution and mediation.
- - List strategies to promote self-help skills and autonomy.

***Unit: Early Childhood Education - Building Partnerships and Nurturing Growth: Family Engagement and Classroom Environments***

Learning Objectives:

- - Describe the importance of cooperative relationships with families.
- - Identify and plan methods of family and community involvement.
- - Describe the components of effective school and home communication.
- - Identify key intentional practices and strategies to become acquainted with the family; describe ways parents can be involved in the program; ways to share goals for the child with the family and teacher, and curriculum objectives.
- - Model and implement effective communication skills to use with personnel and parents and guardians of children.
- - Identify ways that the activity/interest centers and learning stations enhance the development of children.
- - Describe and set up activity/interest centers and learning stations within a well-organized, developmentally appropriate learning environment.
- - Describe the role of play as a basis for learning in infant, toddler, preschool, and elementary age children.
- - Examine the teacher's role in play environments.
- - Design an early childhood classroom that promotes a healthy and safe physical and psychological environment that promotes development and learning.
- - Identify characteristics of a balanced daily schedule including a variety of transition time activities.

***Unit: Early Childhood Education - Inclusive Early Childhood Education: Differentiated Instruction and Curriculum***

Learning Objectives:

- - Evaluate strategies to adapt the learning environment for children with special needs.
- - Demonstrate the ability to identify children's needs, interests, and abilities.
- - Identify characteristics of children with exceptionalities across the major exceptionality categories (intellectual, physical, behavioral, social, and emotional concerns), including the gifted child.

- - Examine practices to differentiate the learning environment and curriculum to accommodate special needs.
- - Examine a variety of curriculum and instructional models.
- - Identify the components of a well-designed lesson plan.
- - Explain how to design and plan sensory activities with supporting materials.
- - Investigate developmentally appropriate materials, lessons, and activities that promote children's respect for diversity.
- - Examine practices that include but are not limited to, multicultural, and linguistic diversity in early childhood education.
- - Examine practices to include learning diversities in early childhood education.

## Core-LX

### Certified Core-LX Teacher

#### *Unit: 1. Classroom Setup*

Learning Objectives:

- - Can create and archive classrooms
- - Can create student accounts and reset passwords and create groups

#### *Unit: 2. Setting up Mastery Progressions with Badges*

Learning Objectives:

- - Can search for and add badges in the classroom
- - Can help students complete all types of learning activities
- - Can use the grader or grade book to review student work and assign a score to all types of learning activities
- - Can filter the grade book by assignment, users, groups and dates, and can generate a data report

#### *Unit: 3. Mastery-Based Learning Management Workflows*

Learning Objectives:

- - Can create a progression of badges in a classroom
- - Can interpret the data in the Badge Progress report
- - Can open a student's playlist and view assignment reports, then based on performance, grant a retry, or override and pass.
- - Can provide a counter-evaluation of a student self-evaluation
- - Can configure and publish the evaluation report for a student and group
- - Can export a group report and individual reports
- - Can grant a badge based on the data in the mastery report

- - Can find the CLR and explain it to a parent

#### ***Unit: 4. Instructional Design and Content Creation***

Learning Objectives:

- - Can create a rubric
- - Can create a Playlist
- - Can search for, favorite, and use a learning object from Core Collection
- - Can create an Assignment Learning Object
- - Can create an Assessment using a range of item types
- - Can create an interactive lesson
- - Can create a discussion learning object
- - Can create a badge stack and badge

#### **Core-LX Student Onboarding**

##### ***Unit: Student Tutorials***

No Learning Objectives available.

##### ***Unit: Student Playlist Demo***

Learning Objectives:

- - Mark Complete an Information page
- - Submit Assignments
- - Submit Auto-Scored and Teacher Scored Quiz items
- - Can submit a discussion
- - Submit an interactive lesson with mixed auto-scored and teacher scored items
- - Do a Self-Evaluation

#### **Transitioning to Quality Online Teaching (MASTER)**

##### ***Unit: Protecting Student Data Privacy When Teaching Remotely***

Learning Objectives:

- - 1. How well do you understand what constitutes personally protected information (PII) and why it should be protected?
- - 2. How well do you understand rules that are part of FERPA and COPPA federal legal guidelines for student data security?
- - 3. How well do you think you are prepared to handle data privacy issues when you next teach remotely?

##### ***Unit: Incorporating Social and Emotional Learning into Remote Teaching Practices***

Learning Objectives:

- - 2. Do you think you can take into account social and emotional learning (SEL) principles when teaching remotely?
- - 1. How well do you understand the competencies that define social and emotional learning (SEL)?

### *Unit: Introduction to the Course*

#### Learning Objectives:

- - B1 The online teacher uses digital pedagogical tools that support communication, productivity, collaboration, analysis, presentation, research, content delivery, and interaction.
- - B2 The online teacher incorporates discipline-specific technologies, tools, and resources to meet individualized learner needs.
- - B3 The online teacher uses different types of tools to interact in online courses in order to nurture learner relationships, encourage learner interaction, and monitor and motivate learner engagement.
- - C1 The online teacher employs learner-centered instructional strategies and current practices that leverage technology for learner collaboration
- - C3 The online teacher develops a community among culturally diverse learners by providing opportunities for interaction that are conducive to active learning.
- - C4 The online teacher promotes learner-learner interaction in online groups in order to foster collaboration and promote higher-order thinking skills such as analysis, synthesis, and/or evaluation.
- - D1 The online teacher uses digital tools to identify patterns in learner engagement and performance that will inform improvements to achieve individual learner growth.
- - D4 The online teacher establishes relationships through timely and encouraging communication, using various formats.
- - H1 The online teacher designs learning experiences that use technology to efficiently engage learners.
- - H2 The online teacher uses a formative approach to lesson design.
- - H3 The online teacher incorporates diverse media into online learning modules.
- - H4 The online teacher is able to incorporate subject-specific and developmentally appropriate digital learning resources into online learning modules.
- - H5 The online teacher continuously reviews and aligns all course content with applicable course objectives and standards.
- - H6 The online teacher creates, selects, and organizes appropriate assignments and assessments to align curricular content with associated standards-based learning goals.

### *Unit: Introduction to Learning Design*

#### Learning Objectives:

- - 1. How well do you understand principles related to Understanding by Design (UbD)?
- - 2. How well do you understand principles related to Universal Design for Learning (UDL)?
- - 3. Do you feel ready to incorporate learning design principles into your remote teaching practice?

#### *Unit: Synchronous and Asynchronous Teaching and Learning*

Learning Objectives:

- - 1. How well do you understand the distinction between synchronous, asynchronous, and blended teaching and learning?
- - 2. How well do you understand the benefits and challenges of different teaching modalities (synchronous, asynchronous and blended)?
- - 3. Do you feel ready to make choices about your remote teaching strategy based on your understanding of different teaching modalities (synchronous, asynchronous and blended)?

#### *Unit: Using Video when Teaching Synchronously*

Learning Objectives:

- - 3. Do you feel ready to incorporate best practices regarding audio, video and professionalism into your use of video conferencing products to teach remotely?
- - 1. How comfortable do you feel using video conferencing tools like Zoom or Google Meet?
- - 2. How well do you understand principles of safety and security when using video conferencing products to teach remotely?

#### *Unit: Incorporating Digital Video into Online Classes*

Learning Objectives:

- - 1. How well do you understand strategies for incorporating digital video into asynchronous or blended classes.
- - 2. Do you feel confident you can locate or create recorded videos that can be incorporated into courses you teach remotely?

#### *Unit: Leveraging the Power of Online Discussion Boards*

Learning Objectives:

- - 1. How confident are you using online discussion board tools?
- - 2. How well do you understand different sorts of pedagogies that can be applied when using online discussion boards?



### ***Unit: Supporting and Transforming Education with Technology***

Learning Objectives:

- - 1. How effectively do you currently use educational technology?
- - 2. How much experience do you have locating, evaluating and implementing new educational technologies?
- - 3. Do you have a framework for understanding how technology integration can impact student learning?

### **Tutorial First-Time Orientation Badge**

#### ***Unit: 0. My First Badge***

Learning Objectives:

- - Complete a Self-Evaluation
- - Complete an Interactive Lesson
- - Complete a Discussion
- - Complete a Quiz
- - Submit an Assignment

### **Open Textbooks**

#### **Introduction to Education**

##### ***Unit: IE 01 - Why Teach?***

Learning Objectives:

- - Understand that the decision to teach is motivated by both intrinsic and extrinsic rewards
- - Identify reasons for teaching
- - Define the role of a teacher in current society

##### ***Unit: IE 02 - What is the Purpose of School?***

Learning Objectives:

- - Understand the basic purposes of school
- - Describe several different understandings of the concept of “school”
- - Define the nature of school for each level: elementary, middle, and high schools

##### ***Unit: IE 03 - Who are Today's Students?***

Learning Objectives:

- - Discuss the predominant issues and societal trends confronting contemporary education.
- - Identify diversity and how it impacts education
- - Explain how the role of the teacher both is impacted and impacts how children are served in the school

#### *Unit: IE 04 - How Do Social Issues Affect Students?*

Learning Objectives:

- - Identify critical social issues that directly influence the students' academic success in the classroom
- - Describe the impact poverty has on a student's potential for success in schools
- - Define the role of communication between the school and family

#### *Unit: IE 05 - What is an Educational Philosophy?*

Learning Objectives:

- - Define, describe, and identify the four branches of educational philosophy
- - Outline at least two educational philosophies that influence our schools
- - Explain how educational philosophies influence the choice of curriculum and classroom instructional practices
- - Develop a personal philosophy concerning teaching and learning

#### *Unit: IE 06 - Excellence or Equity...Which is More Important?*

Learning Objectives:

- - Identify the historical struggles for equity and excellence in education
- - Describe the impact of tracking students in education
- - Provide a brief overview of the struggles for equal educational opportunities for identified groups of students

#### *Unit: IE 07 - What are the Ethical and Legal Issues in Schools?*

Learning Objectives:

- - Distinguish the difference between laws and ethics and explain how both are necessary for teachers
- - Identify several ways that ethics are involved with teachers day to day activities
- - Describe the hierarchy of school systems
- - Identify several key areas of the law related to student and teachers

#### *Unit: IE 08 - What is Taught?*

Learning Objectives:

- - Identify curriculum standards and how they are used to plan lessons
- - Describe how educators can differentiate curriculum to meet student needs
- - Name the major subject-matter areas taught in elementary and secondary schools

***Unit: IE 09 - What is a Positive Classroom Environment?***

Learning Objectives:

- - Identify basic classroom management principles for learning and academic achievement
- - Name several steps to respond to conflicts and behavior issues in the classroom

***Unit: IE 10 - What Makes an Effective Teacher?***

Learning Objectives:

- - Define learning as it relates to effectiveness as an educator
- - Identify the four domains of Danielson's Frameworks for Teaching and how they relate to teacher effectiveness
- - Describe what it meant by the teacher as a "reflective decision maker"

***Unit: IE 11 - What Can a New Teacher Expect?***

Learning Objectives:

- - Discuss why the act of instructing students can be a stumbling block for new teachers.
- - Explain why new teachers often have difficulties with parents who should be their natural allies.
- - Summarize the chief strategies that can contribute to a successful first year of teaching

## **Pointful Education**

### **Early Childhood Education I**

***Unit: EarlyChildEd\_01 01: The Early Childhood Education Profession***

Learning Objectives:

- - Identify early childhood education career opportunities
- - Compare roles and responsibilities of the childcare center team members
- - Identify the important role childcare givers play in the development of each child in care
- - Describe the need for quality childcare and the benefits to children, families, and communities
- - Discuss the evolution of the childcare industry

***Unit: EarlyChildEd\_01 02: Planning a Safe, Clean, and Healthy Learning Environment***

## Learning Objectives:

- - Identify and describe characteristics of a safe, sanitary, healthy childcare environment.
- - Describe ways to assist children with personal hygiene routines.
- - Recognize potential safety and fire hazards and develop a procedure to prevent accidents.
- - Identify and describe regulations for transporting children.
- - Outline the steps for proper use of fire extinguishers (i.e.: students watch a video, observe someone else demonstrate, etc.).
- - Follow and understand how to complete an accident/incident form using established procedures.
- - Identify and describe components of a playground safety checklist.
- - Summarize best practices within the center to conserve environmental resources.
- - Discuss methods to promote positive attitudes and skills for daily routines for children.

***Unit: EarlyChildEd\_01 03: Planning Food Service & Nutrition***

## Learning Objectives:

- - Identify the nutritional needs of infants through school age children (birth through age eight).
- - Identify and plan nutritious snacks and meals for infants through school age children (birth through age eight).
- - Describe safe and sanitary food service habits in assisting with mealtime routines.
- - Identify foods that are potentially dangerous for young children's consumption (including common allergens like peanuts).
- - Describe how to encourage positive food choices and good eating habits for toddlers through school age children.
- - Use United States Department of Agriculture (USDA) current guidelines as a tool for planning nutritious meals.
- - Identify guidelines for purchasing, receiving, storing, and safety of foods as defined in Department of Children and Families administrative rule.
- - Recognize age appropriate nutrition education activities.

***Unit: EarlyChildEd\_01 06: Methods of Guidance***

## Learning Objectives:

- - Identify and describe methods of guidance of children's behavior at age-appropriate levels.

- - Differentiate methods of direct and indirect guidance (i.e.: concepts of room arrangements, transitions, routines, etc.).
- - Distinguish between appropriate/inappropriate methods of guiding behaviors by the childcare professional.
- - Discuss the importance of communicating with families regarding expectations of children's behavior (i.e.: NAEYC and DAP, etc.) guidelines.

***Unit: EarlyChildEd\_01 04: Typical & Atypical Development***

Learning Objectives:

- - Compare and contrast the characteristics of typical and atypical development.
- - Describe the principles and stages of development.
- - Describe the characteristic of children ages birth to eight in the following domains: physical development; approaches to learning; social and emotional; language and communication; and cognitive development and general knowledge.
- - Discuss circumstances and factors that put a child at risk for developmental delays.
- - Identify and describe theories of human development including cognitive psycho-social, socio-cultural, psychoanalytical, and behaviorist.
- - Create a developmentally appropriate learning activity.

***Unit: EarlyChildEd\_01 05: Observation & Recording Methods***

Learning Objectives:

- - Identify observation techniques and methods used in a childcare setting.
- - Discuss the differences between observations, screenings, developmental assessments, and developmental evaluations.
- - Discuss the importance of including the family in the collection of information for observations.
- - Identify the steps for conferring with parents when a developmental delay is suspected.
- - Discuss the importance of confidentiality of child/family records.

***Unit: EarlyChildEd\_01 07: The Influences of Nutrition, Environment, and Heredity***

Learning Objectives:

- - Identify characteristics of a healthy child.
- - Identify and describe symptoms of childhood illness and communicable diseases.
- - Identify the components of and perform a "10 second health check" for children.
- - Describe ways in which the spread of disease in childcare settings can be prevented.
- - Demonstrate how to communicate with parents who continue to send children to childcare when they are sick.

- - Investigate current information on child nutrition, the environment, heredity and discuss their effect upon the development of a child.
- - Discuss how a child's health status influences development.
- - Describe the importance of physical fitness to health status and development.

***Unit: EarlyChildEd\_01 08: Current and Future Technology in Childcare***

Learning Objectives:

- - Demonstrate appropriate use of technology by childcare professionals (i.e.: online assessments, lesson plans, presentation software, etc.).
- - Analyze appropriate uses of current technology in a childcare setting.
- - Describe the use of robotic technology for young children.
- - Evaluate the opportunities and challenges of "screen time" on young children.
- - Discuss the pros and cons of video surveillance at childcare centers.

***Unit: EarlyChildEd\_01 09: Exploring Your State: Child Abuse and Neglect***

Learning Objectives:

- - Describe the characteristics of abusers.
- - Identify the most common physical and behavioral indicators of physical abuse, sexual abuse, emotional abuse and neglect.
- - List the factors, multiple forces, and most common risk factors for child abuse and neglect.
- - Discuss the impacts and effects of child abuse and neglect.
- - Identify the examples of human trafficking and the physical and behavioral indicators associated.
- - Describe physical abuse, physical neglect, sexual abuse, and emotional abuse as defined by your state's law.
- - Discuss the data regarding statistics as they pertain to child abuse at state and national levels.
- - Describe the legal requirement and protection provided to childcare workers in reporting suspected child abuse and neglect according to Florida law (ie. Mandatory reporting, etc.) or the state of residence. Identify state and local guidelines and procedures for reporting child abuse and neglect.
- - Identify the necessary information for completing a mock report of child abuse and neglect and how to submit the report.
- - Identify local community resources that provide help for the abused and the abuser.
- - Recognize the reporting requirements of at-risk children (i.e.: children in protective services, human trafficking, etc.).

***Unit: EarlyChildEd\_01 10: Exploring Your State: Rules and Regulations in Childcare***

Learning Objectives:

- - Recognize the stakeholders in the childcare profession (i.e.: ELC, licensing, agencies, etc.)
- - Identify the different types of childcare facilities and licensing requirements
- - Identify the components of your state's statutes as they relate to areas of childcare standards
- - Identify local and state licensing agencies and their responsibilities
- - Identify local and state fire, safety, sanitation, and health regulations
- - Identify minimum state standards for screening owners, operators, staff, and volunteers of childcare centers
- - Identify and discuss current childcare issues and proposed laws and ordinances that govern state and local licensing and inspection of childcare facilities
- - Identify information concerning child discipline in state rules
- - Identify methods of compliance with rules and regulations governing childcare givers

***Unit: EarlyChildEd\_01 00: Module 0***

Learning Objectives:

- - Completion

***Unit: EarlyChildEd\_01 11: Course Wrap-up/Final Exam***

Learning Objectives:

- - Completion

**Early Childhood Education II*****Unit: EarlyChildEd\_02 00: Module 0***

Learning Objectives:

- - Completion

***Unit: EarlyChildEd\_02 01: Professionalism Part I***

Learning Objectives:

- - Explain the importance of professional development, ethical standards, accreditation, confidentiality, credentialing, professional organization membership/participation, and self-reflection for childcare professionals.
- - Identify and use job-related childcare terminology.
- - Participate in regular self-assessment including attitude and performance.
- - Demonstrate exemplary behavior and social skills as a positive role model for children.

***Unit: EarlyChildEd\_02 02: Professionalism Part II***

## Learning Objectives:

- - Distinguish between professional and unprofessional behavior when serving as a role model for children.
- - Describe legal issues and liability as they relate to childcare professionals (i.e.: social media posts, confidentiality, etc.).
- - Identify and review resources on the National Association for the Education of Young Children Website ([www.naeyc.org](http://www.naeyc.org)).
- - Observe teaching situations depicting ethical problems and use the NAEYC Code of Ethics to propose potential solutions.
- - Identify and describe various teaching methods and learning styles for effective teaching practices.

***Unit: EarlyChildEd\_02 03: Observation and Recording Methods and the History of School-Age Childcare***

## Learning Objectives:

- - Analyze appropriate observation methods and tools for recording (i.e.: anecdotal records, running records, checklists, etc.).
- - Observe, record, and report the behavior of children using various observation tools.
- - Describe the need for school-age childcare and how it has evolved.
- - Describe different types of programs available for children before and after school; during summer; and on school holidays.
- - Explain the professional characteristics of a school-age caregiver.

***Unit: EarlyChildEd\_02 07: Language Use and Acquisition***

## Learning Objectives:

- - Use an appropriate vocabulary that increases in complexity and variety.
- - Describe the importance of vocabulary development in young children.
- - Use proper grammar when speaking to parents and/or children.
- - Identify the stages of language acquisition.
- - Model and reinforce correct grammar.
- - Create a lesson or activity that promotes appropriate language acquisition.
- - Create a lesson or an activity which promotes vocabulary development.

***Unit: EarlyChildEd\_02 04: The History of School-Age Childcare***

## Learning Objectives:

- - Explain why and how individual children may overlap both younger and older chronological programs.



- - Examine how a caregiver can plan to meet the social, emotional, physical and cognitive needs of school-age children.
- - Discuss the School Age Professional Certificate Credential.

***Unit: EarlyChildEd\_02 05: Developmentally Appropriate Care and Activities for Infants and Toddlers***

Learning Objectives:

- - Explain visual, auditory, olfactory, gustatory, and tactile stimulation activities.
- - Describe and plan activities that stimulate gross and fine motor development.
- - Identify age-appropriate nutritional snacks.
- - Review appropriate feeding, diapering, toilet training, bathing, dressing, and grooming techniques.
- - Demonstrate/simulate sanitary procedures in feeding, changing diapers, toileting, and maintaining the environment for infants and toddlers.

***Unit: EarlyChildEd\_02 06: Schedules, Spaces, and Experiences that Enhance Children's Total Growth and Development***

Learning Objectives:

- - Evaluate all aspects of an environment that provides opportunities for children to learn through their play.
- - Assist with planning and evaluating schedules that include active and quiet times, individual, small, and large group experiences, as well as, child and adult initiated activities.
- - Implement techniques for facilitating children's successful participation in all aspects of a program.
- - Describe how major theories of human development provide a basis for planning a program.

***Unit: EarlyChildEd\_02 08: DAP for Programs Serving Children Birth Through Age 8***

Learning Objectives:

- - Content
- - Followed Guidelines
- - Presentation
- - Mechanics

***Unit: EarlyChildEd\_02 09: Professional Relationship Skills***

Learning Objectives:

- - Identify traits of positive self-image, self-esteem, and self-growth.

- - Create intrapersonal goals and exhibit responsibility toward achieving goals.
- - Describe and display ways to show empathy, understanding and caring (i.e. bullying, bias, cultural awareness, etc.).
- - Identify appropriate strategies that enhance respectful, reciprocal relationships between children, families, and co-workers (i.e. honesty, integrity, etc.).
- - Describe the needs and strengths of a diverse workplace.
- - Demonstrate effective conflict resolution skills.

***Unit: EarlyChildEd\_02 10: Brain Research and Communication Skills***

Learning Objectives:

- - Explain common terms and concepts related to brain development and the formation of neuronal connections.
- - Use the internet to prepare a list of recent resources pertaining to brain research.
- - Identify effective communication skills used with children including interacting positively with each child and dialog with children as a group, using active listening, open-ended questioning, activities, and teachable moments.
- - Identify ways to promote positive interaction between the family, childcare professionals, and community (i.e. networking, newsletters, written communication, etc.).

***Unit: EarlyChildEd\_02 11: Preparing for the Child Development Associate Certification***

Learning Objectives:

- - Understand the requirements for the Child Development Associate Certification
- - Preparing for the Child Development Associate Certification Exam
- - Portfolio Preparation for the Child Development Associate Certification Exam

***Unit: EarlyChildEd\_02 12: Course Wrap-up/Final Exam***

Learning Objectives:

- - Completion

**Education & Teaching Advanced**

***Unit: Education & Teaching Advanced IET 00: Start Here***

Learning Objectives:

- - Completion

***Unit: Education & Teaching Advanced IET 01: The History of Education in the United States***

Learning Objectives:

- - Construct a timeline of education before 1900 in the United States.
- - Identify key changes in brick and mortar education through 1960.
- - Evaluate the historical events which impacted brick and mortar education from 1960 to the present day.
- - Analyze the impact of the introduction of various technologies to brick and mortar education.
- - Understand the present-day structure of federal and state government as it pertains to education.

#### ***Unit: Education & Teaching Advanced IET 02: An Introduction to Distance Learning***

##### Learning Objectives:

- - Construct a timeline of distance education from its beginnings to the present day.
- - Evaluate the differences between face-to-face instruction and distance learning.
- - Identify the key features of various Learning Management Systems and Student Information Systems required for distance learning.
- - Outline the key components in online learning from organizations such as iNACOL and Quality Matters.
- - Compare and contrast digital learning within K-12 and Higher Education.

#### ***Unit: Education & Teaching Advanced IET 03: Blended, Personalized and Adaptive Learning***

##### Learning Objectives:

- - Define blended learning and its various instructional models.
- - Define personalized learning and its various instructional models.
- - Define adaptive learning and its various instructional models.
- - Compare and contrast blended, personalized and adaptive learning.
- - Discuss the systems available to support blended, personalized, and adaptive learning.

#### ***Unit: Education & Teaching Advanced IET 04: Augmented and Virtual Reality in Education***

##### Learning Objectives:

- - Define key terms related to AR/VR in education
- - Evaluate applications of AR/VR in education in the classroom and in corporate training
- - Predict when they will first use AV/VR in school
- - Determine the impact that learning using AR/VR could have on educational outcomes
- - Discuss potential drawbacks and distractions that AR/VR could cause in education
- - Identify potential career opportunities within AR/VR in education and educational paths to enter those careers

#### ***Unit: Education & Teaching Advanced IET 05: Robots at School***

##### Learning Objectives:

- - Evaluate various uses of robotics used in education
- - Describe how robots are used to assist children with disabilities
- - Compare the benefits and limitations of utilizing robots and artificial intelligence in education
- - Discuss the impact that robots may have on the teaching profession
- - Identify career opportunities in educational robotics and describe how teachers and students can utilize robotics and AI to achieve positive educational outcomes

***Unit: Education & Teaching Advanced IET 06: Wearable Technology in Education***

Learning Objectives:

- - Define key terms related to wearable technology in education
- - Describe current and potential applications of wearable technology in education for both students and teachers
- - Evaluate the use of augmented and virtual reality systems to enhance learning experiences
- - Discuss the potential risks and downsides of utilizing wearable technologies for education, such as technical problems, high cost, and cheating
- - Examine how wearable technology and AR/VR can contribute to digital distraction and what students can do to increase focus and attention

***Unit: Education & Teaching Advanced IET 07: Careers in Education***

Learning Objectives:

- - Describe the education requirements and the role of the teacher in K-12 brick and mortar and distance learning.
- - Discuss the education requirements and the role of the administrator in K-12 brick and mortar and distance learning.
- - Compare and contrast the education requirements and roles within education technology careers.
- - Discuss the education requirements and the role of the counselor in K-12 learning.
- - Identify the differences and similarities in the education requirements and roles of the teacher, the administrator, and the counselor between K-12 and Higher Education.

***Unit: Education & Teaching Advanced IET 08: Future of Education***

Learning Objectives:

- - Describe how brick and mortar education will change with new and emerging technologies.
- - Describe how advances in technology will benefit distance learning.
- - Compare and contrast various learning modalities and their impact on the future of education.

- - Discuss the possible risks and downsides of relying on technology in education.
- - Analyze the global impact of distance learning and its various benefits to countries other than the United States.

*Unit: Education & Teaching Advanced IET 09: Course Wrap-up / Final Exam*

Learning Objectives:

- - Completion

## Finance

### Certify ED

#### Personal Finance (Video & VR)

*Unit: Personal Finance - Unit Sim*

Learning Objectives:

- - Understand earning income
- - Understand opening bank accounts
- - Understand managing expenses

*Unit: Personal Finance - Taking Control: The Foundation of Personal Finance*

Learning Objectives:

- - Discuss the importance of taking responsibility for personal financial decisions.
- - Identify the importance of financially self-sufficient families to the stability of the economic system.
- - Explain how the personal choices people make are interconnected with their financial resources.
- - Apply a decision-making process to making consumer choices concerning public transportation and vehicle ownership, including leasing versus owning and new versus used.
- - Apply a decision-making process to consumer choices concerning housing, including renting versus owning.
- - Describe how shared decision-making regarding income allocation and expenditures works in a family setting.
- - Explain the interrelationship of time, effort, and money in achieving personal and family goals.
- - Explain how inflation affects spending and investing decisions.
- - Identify potential sources of income.

- - Explain discretionary and disposable income and how it affects personal and family spending.

***Unit: Personal Finance - Career, Education, and Income: Building a Solid Financial Foundation***

Learning Objectives:

- - Analyze how career choice has an impact on income.
- - Analyze how education and technical skills have an effect on income.
- - Identify the advantages and disadvantages of dual income families.
- - Relate personal income and financial goals to life events.
- - Identify the opportunity cost of various financial decisions, including the costs of time, risk, and resources.
- - Explain how work ethic, abilities, and attitude are all factors impacting one's employability and earning potential.
- - Compute gross pay, payroll deductions, and net pay.
- - Demonstrate an understanding of different forms of payment, such as salary, hourly, contract, and 1099s.
- - Identify optional and required employee benefits and recognize the value in addition to net pay.

***Unit: Personal Finance - Basics of Taxation: From Tax Principles to Return Preparation***

Learning Objectives:

- - Explain the basic principles of taxation.
- - List the types and sources of taxes at the local, state, and federal levels.
- - Explain the purposes and types of taxes in the United States, such as progressive, regressive, and proportional taxes.
- - Explain how taxes, government transfer payments, and employee benefits relate to disposable income.
- - Define basic tax terminology, such as taxable income, tax credits, exemptions, deductions, and itemized deductions.
- - Prepare U.S. individual federal income tax return Forms 1040EZ and 1040A.
- - Identify penalties related to non-payment of income tax.

***Unit: Personal Finance - Managing Your Money: Navigating Financial Institutions and Services***

Learning Objectives:

- - Explain how to use money-management tools available from financial institutions.
- - Evaluate services provided by financial deposit institutions to transfer funds.
- - Analyze the role of banks and other financial institutions in the world economy.
- - Identify the rules and regulations of financial institutions pertaining to the consumer, including FDIC, Dodd-Frank Act, etc.

- - List and explain the types of checking accounts and banking services available to customers.
- - Demonstrate knowledge of opening and managing bank accounts to deposit funds for spending and savings.
- - Identify various ways to deposit and withdraw funds for bank accounts and verify how to use each method safely, including using a secure network when transmitting pictures of checks for deposit.
- - Prepare checks and deposit slips.
- - Record transactions in checkbook registers and reconcile bank statements.
- - Identify and distinguish between various check endorsements, such as blank, restricted, and special.
- - Explain the difference between debit and credit cards.
- - Apply simple and compound interest formulas.
- - Explain how to balance a checking account.
- - Explain the concept of net worth.
- - Design a budget plan for earning, spending, and saving.

***Unit: Personal Finance - Financial Planning: Saving, Investing, and Retirement***

Learning Objectives:

- - Explain the purpose of financial planning.
- - Explain the relationship between saving and investing.
- - Describe reasons for saving and investing.
- - Identify and classify investment options, such as stocks, government and corporate bonds, and mutual funds.
- - Explain the degree of diversification based on the investor's risk tolerance.
- - Identify and describe various retirement accounts, such as Roth and Traditional IRAs, 401k, and 403b.
- - Compare the risk, return, and liquidity of investment alternatives.
- - Describe how to buy and sell investments.
- - Explain how different factors affect the rate of return of investments.
- - Explain how to use the Rule of 72 to evaluate investment choices.

***Unit: Personal Finance - Investing and Credit: Building Financial Stability***

Learning Objectives:

- - Identify and evaluate credible sources of investment information.
- - Explain how agencies that regulate financial markets protect investors.
- - Design a plan for investing to increase net worth.
- - Define credit and identify the role consumer credit has in today's economy.

- - Compare the advantages and disadvantages of different payment methods and understand the implications of paying minimum balances.
- - Analyze the benefits and costs of consumer credit.
- - Compare sources of consumer credit.
- - Explain factors that affect creditworthiness and the purpose of credit records.
- - Explain the components of credit scores.

***Unit: Personal Finance - Managing Credit and Debt: A Consumer's Guide***

Learning Objectives:

- - Identify ways to avoid or correct credit problems.
- - Explain the rights and responsibilities of buyers and sellers under consumer protection laws.
- - Explain how and who uses your credit report.
- - Identify the credit-reporting agencies and demonstrate how to obtain and read a sample credit report.
- - Define debt and identify how to effectively balance credit and debt to achieve short-term and long-term goals.
- - Explore options for paying for post-secondary education opportunities.
- - Analyze the risks and consequences of consumer credit, including bankruptcy, foreclosure, co-signing, lower credit score, and lower credit worthiness.

***Unit: Personal Finance - Consumer Protection and Informed Decision-Making***

Learning Objectives:

- - Identify and explain fraudulent and deceptive business practices.
- - Identify and describe wise consumer behavior by classifying the benefits and costs of spending decisions, evaluating information about products and services, and using a rational decision-making model to select one option over another.
- - List and describe consumer legislation and sources of consumer protection.
- - Describe how to contact public officials to express opinions.
- - Explain how consumers can get redress and other ways of finding remedies to consumer problems.
- - Explain warranties and the relevance of the Federal Trade Commission.
- - Explain how federal student aid is available to help pay for college.
- - Describe the effects of advertising on consumer purchases.
- - Describe the effects of social media on consumer purchases.
- - Demonstrate planned purchasing decisions, factoring in direct costs (price) and indirect costs (e.g. sales/use tax, excise tax, shipping, handling, and delivery charges, etc.) as part of being an informed consumer.



***Unit: Personal Finance - Protecting Your Financial Future: Consumer Protection, Identity Theft, and Insurance***

Learning Objectives:

- - Describe consumer protections related to debt collection and bankruptcy.
- - Describe common ways identity theft happens, such as dumpster diving, skimming, phishing, changing addresses, stealing, and computer hacking.
- - Describe ways to deter identity theft by safeguarding information, such as shredding financial documents, protecting Social Security number, not giving out personal information, using secure networks for online banking, and not using obvious passwords.
- - Describe ways to detect suspicious activity by routinely monitoring accounts, including reviewing credit reports, online balances, and monthly statements.
- - Describe ways to defend against identity theft as soon as theft is suspected.
- - Explain how risk is transferred through insurance.
- - Define insurability and explain why rates vary.
- - Distinguish between insurable and non-insurable risks and the concept of economic loss.
- - Examine ways to reduce the cost of insurance.
- - Identify and cite reasons for insurance policy cancellation.

***Unit: Personal Finance - Protecting Your Assets: Understanding Insurance and Risk Management***

Learning Objectives:

- - Evaluate different types of automobile insurance coverage, including riders and endorsements.
- - Describe coverage common to most home and rental insurance policies and explain how the amount of coverage needed is determined.
- - Identify and describe basic types of coverage and features offered by health insurance companies.
- - Assess the need for umbrella and excess liability insurance coverage.
- - Define the responsibility of the insured for co-pay, deductible, and non-covered medical expenses.
- - Define Medicaid and Medicare and describe the role of the Consolidated Omnibus Budget Reconciliation Act (COBRA).
- - Explain the purpose of life insurance and the basic difference between term and whole life insurance.
- - Explain the need for and benefits of disability coverage.
- - Explain the role of Social Security in providing disability benefits.
- - Explain the role of workers' compensation insurance.

- - Define unemployment insurance.

## GoSkills

### Finance for Non-Financial Professionals

#### *Unit: Finance Fundamentals:*

Learning Objectives:

- - Understand finance fundamentals: amount, timing, revenues & profits

#### *Unit: Budgeting*

Learning Objectives:

- - Utilize ratios and measures to gain insight into profitability and performance
- - Identify the different categories of cost accounts for budgeting and tracking spending

#### *Unit: Financial Reports*

Learning Objectives:

- - Interpret data on financial reports and how these reports impact each other.

#### *Unit: Ratios and Measures*

Learning Objectives:

- - Formulate strong estimates, and determine when to capitalize and depreciate an asset.

#### *Unit: Business Case*

Learning Objectives:

- - Develop a business case to provide rationale for why a project should be undertaken.

#### *Unit: Variance and Forecasting*

Learning Objectives:

- - Understand cost behavior and cost variance reporting.

#### *Unit: Finance for Non-Financial Professionals: Badge Test*

Learning Objectives:

- - Completion

### Financial Modeling Basics

#### *Unit: What is Best Practice?*

Learning Objectives:

- - Understand the four key attributes of a good financial model.

#### ***Unit: Layout Tips***

Learning Objectives:

- - Use Excel keyboard shortcuts to speed up my modeling
- - Layout my model to make it easy to understand and navigate through
- - Design my model to separate the inputs and calculations
- - Distinguish between formats and styles, and how to import styles into a workbook
- - Use number formatting and custom number formats
- - Recognize when and how to effectively apply conditional formatting

#### ***Unit: Range Names***

Learning Objectives:

- - Assign and use range names, add hyperlinks and data validation
- - Apply checks to keep my model error free

#### ***Unit: Viewing, Linking, Protection, and Version Control Tips***

Learning Objectives:

- - Printing and viewing tips, linking tips and security tips to protect my model

#### ***Unit: Key Functions***

Learning Objectives:

- - Key Excel functions that are essential to know when building a financial model

#### ***Unit: Financial Modeling Basics: Final Exam***

Learning Objectives:

- - Completion

### **Introduction to Data Analysis with Python**

#### ***Unit: Development Environment Setup***

Learning Objectives:

- - I can install Python on my operating system.

#### ***Unit: Numpy***

Learning Objectives:

- - Import and install Numpy.
- - Use Numpy arrays, operations, and universal functions.

***Unit: Pandas***

Learning Objectives:

- - Install Pandas data analysis toolkit.
- - Use Pandas series and DataFrames.
- - Clean and prepare your data with Pandas DataFrames.

***Unit: Pandas Visualization***

Learning Objectives:

- - Create data visualizations with Pandas.

***Unit: Linear Regression With SciKitLearn***

Learning Objectives:

- - Install SciKitLearn to make predictions using essential machine learning.
- - Create and analyze a linear regression model.

***Unit: Intro to Data Analysis With Python: Final Exam***

Learning Objectives:

- - Completion

**QuickBooks Online*****Unit: Chart of Accounts***

Learning Objectives:

- - Add, inactivate, edit, and merge accounts.

***Unit: Reporting***

Learning Objectives:

- - Locate, drill down into, and modify reports.

***Unit: Banking***

Learning Objectives:

- - Set up a checking account.
- - Transfer funds between balance sheet accounts.
- - Locate and modify the bank register.

***Unit: Navigation***

Learning Objectives:

- - Navigate the Quickbooks Online interface.

#### ***Unit: Common Errors***

Learning Objectives:

- - Identify errors in the bank register and profit & loss report.

#### ***Unit: Income***

Learning Objectives:

- - Add customer information.
- - Create sales receipts and invoices.
- - Deposit combined payments.

#### ***Unit: Products and Services***

Learning Objectives:

- - Add, inactivate, edit, and merge accounts.

#### ***Unit: Expenses***

Learning Objectives:

- - Add vendor information.
- - Record expenses.

#### ***Unit: QuickBooks Online: Final Test***

Learning Objectives:

- - Completion

## **Open Textbooks**

### **Introduction to Financial Accounting**

#### ***Unit: Introduction to Financial Accounting***

Learning Objectives:

- - Understand accounting principles and processes, including defining accounting, recognizing different business forms, explaining GAAP, preparing financial statements, and analyzing transactions using the accounting equation.
- - Understand and apply fundamental accounting concepts, including analyzing transactions using double-entry accounting, preparing trial balances, recording transactions in journals and ledgers, and defining the accounting cycle.

- - Understand and apply adjusting entries as per GAAP principles, including explaining the need for adjusting entries, preparing entries for various scenarios (prepaid expenses, depreciation, unearned revenues, accrued revenues, and accrued expenses), and preparing and explaining the use of an adjusted trial balance.
- - Master the full accounting cycle, from utilizing an adjusted trial balance to preparing financial statements, closing entries, a classified balance sheet, and understanding financial statement disclosures, auditor's reports, and management's responsibilities.
- - Evaluate inventory management through different cost flow assumptions (specific identification, FIFO, and weighted average) for both perpetual and periodic systems, and understand their impact on financial statements, lower of cost and net realizable value adjustments, estimating inventory using the gross profit and retail inventory methods, and calculating merchandise inventory turnover.
- - Comprehend internal control concepts as applied to cash, accurately journalize petty cash transactions, and proficiently prepare bank reconciliations, including recording necessary adjustments
- - Understand, calculate, and accurately record estimated uncollectible accounts receivable, including write-offs and recoveries, and explain and record short-term notes receivable along with related interest calculations
- - Manage and account for various aspects of long-term assets, including determining their cost, calculating depreciation using multiple methods, handling partial-year depreciation, accounting for revised depreciation due to capital expenditures, addressing asset impairments, derecognition of assets, handling intangible assets, recognizing goodwill, and complying with disclosure requirements in the financial statement notes.
- - Differentiate between current and long-term liabilities, accurately record and disclose both known and estimated current liabilities, and understand how to calculate and record long-term loans
- - Manage corporate organization aspects, including identifying characteristics of the corporate form and share classes, recording and disclosing preferred and common share transactions, cash dividends, and share dividends, as well as calculating and explaining the book value per share ratio
- - Understand the significance of the statement of cash flows, be capable of preparing it, and adept at interpreting the statement
- - Analyze financial statements, students will learn to use ratio analysis for evaluating liquidity, profitability, leverage, and market performance, as well as apply horizontal and vertical trend analysis.
- - Distinguish the characteristics of proprietorships and partnerships, understanding how their financial statements differ from those of corporations

## Principles of Accounting

### *Unit: POA01: Role of Accounting in Society*

#### Learning Objectives:

- - Explain the importance of accounting and distinguish between financial and managerial accounting
- - Identify users of accounting information and how they apply information
- - Describe typical accounting activities and the role accountants play in Identifying, recording, and reporting financial activities
- - Explain why accounting is important to business stakeholders
- - Describe the varied career paths open to individuals with an accounting education

### *Unit: POA02: Introduction to Financial Statements*

#### Learning Objectives:

- - Describe the income statement, statement of retained earnings, balance sheet, and statement of cash flows, and how they interrelate
- - Prepare an income statement, statement of retained earnings, and balance sheet

### *Unit: POA03: Analyzing and Recording Transactions*

#### Learning Objectives:

- - Describe principles, assumptions, and concepts of accounting and their relationship to financial statements
- - Define and describe the expanded accounting equation and its relationship to analyzing transactions
- - Define and describe the initial steps in the accounting cycle
- - Analyze business transactions using the accounting equation and show the impact of business transactions on financial statements
- - Use journal entries to record transactions and post to T-Accounts
- - Prepare a trial balance

### *Unit: POA04: The Adjustment Process*

#### Learning Objectives:

- - Explain the concepts and guidelines affecting adjusting entries
- - Discuss the adjustment process and illustrate common types of adjusting entries
- - Record and post the common types of adjusting entries
- - Use the ledger balances to prepare an adjusted trial balance
- - Prepare financial statements using the adjusted trial balance

- - Define, explain, and provide examples of current and noncurrent assets, current and noncurrent liabilities
- - Use a 10-column worksheet

#### *Unit: POA05: Completing the Accounting Cycle*

##### Learning Objectives:

- - Describe and prepare closing entries for a business
- - Prepare a post-closing trial balance
- - Apply the results from the adjusted trial balance to compute current ratio and working capital balance, and explain how these measures represent liquidity
- - Complete a comprehensive accounting cycle for a business

#### *Unit: POA06: Merchandising Transactions*

##### Learning Objectives:

- - Compare and contrast merchandising versus service activities and transactions
- - Compare and contrast perpetual versus periodic inventory systems
- - Analyze and record transactions for merchandise purchases using the perpetual inventory system
- - Analyze and record transactions for the sale of merchandise using the perpetual inventory system
- - Analyze and record adjusting entries for the sale of merchandise using the perpetual inventory system
- - Discuss and record transactions applying the two commonly used freight-in methods
- - Describe and prepare multi-step and simple income statements for merchandising companies
- - Analyze and record transactions for merchandise purchases and sales using the periodic inventory system

#### *Unit: POA07: Inventory*

##### Learning Objectives:

- - Describe and demonstrate the basic inventory valuation methods and their cost flow assumptions
- - Calculate the cost of goods sold and ending inventory using the periodic method
- - Calculate the cost of goods sold and ending inventory using the perpetual method
- - Explain and demonstrate the impact of inventory valuation errors on the income statement and balance sheet
- - Examine the efficiency of inventory management using financial ratios



***Unit: POA08: Fraud, Internal Controls, and Cash***

## Learning Objectives:

- - Analyze fraud in the accounting workplace
- - Define and explain internal controls and their purpose within an organization
- - Describe internal controls within an organization
- - Define the purpose and use of a petty cash fund, and prepare petty cash journal entries
- - Discuss management responsibilities for maintaining internal controls within an organization
- - Define the purpose of a bank reconciliation, and prepare a bank reconciliation and its associated journal entries
- - Describe fraud in financial statements and sarbanes-oxley act requirements

***Unit: POA09: Accounting for Receivables***

## Learning Objectives:

- - Explain the revenue recognition principle and how it relates to current and future sales and purchase transactions
- - Account for uncollectible accounts using the balance sheet and income statement approaches
- - Determine the efficiency of receivables management using financial ratios
- - Discuss the role of accounting for receivables in earnings management
- - Apply revenue recognition principles to long-term projects
- - Explain how notes receivable and accounts receivable differ

***Unit: POA10: Long-Term Assets***

## Learning Objectives:

- - Distinguish between tangible and intangible assets
- - Analyze and classify capitalized costs versus expenses
- - Explain and apply depreciation methods to allocate capitalized costs
- - Describe accounting for intangible assets and record related transactions
- - Describe some special issues in accounting for long-term assets

***Unit: POA11: Current Liabilities***

## Learning Objectives:

- - Identify and describe current liabilities
- - Analyze, journalize, and report current liabilities
- - Define and apply accounting treatment for contingent liabilities
- - Prepare journal entries to record short-term notes payable
- - Record transactions incurred in preparing payroll

***Unit: POA12: Long-Term Liabilities***

Learning Objectives:

- - Explain the pricing of long-term liabilities
- - Compute amortization of long-term liabilities using the effective-interest method
- - Prepare journal entries to reflect the life cycle of bonds

***Unit: POA13: Corporation Accounting***

Learning Objectives:

- - Explain the process of securing equity financing through the issuance of stock
- - Analyze and record transactions for the issuance and repurchase of stock
- - Record transactions and the effects on financial statements for cash dividends, property dividends, stock dividends, and stock splits
- - Compare and contrast owners' equity versus retained earnings
- - Discuss the applicability of earnings per share as a method to measure performance

***Unit: POA14: Statement of Cash Flows***

Learning Objectives:

- - Explain the purpose of the statement of cash flows
- - Differentiate between operating, investing, and financing activities
- - Prepare the statement of cash flows using the indirect method
- - Prepare the completed statement of cash flows using the indirect method
- - Use information from the statement of cash flows to prepare ratios to assess liquidity and solvency

***Unit: POA15: Financial Statement Analysis***

Learning Objectives:

- - Conduct, report, and interpret horizontal, vertical, and ratio analyses of financial statements
- - Conduct, report, and interpret horizontal, vertical, and ratio analyses of financial statements

***Unit: POA16: Accounting Information Systems***

Learning Objectives:

- - Define and describe the components of an accounting information system
- - Describe and explain the purpose of special journals and their importance to stakeholders
- - Analyze and journalize transactions using special journals
- - Prepare a subsidiary ledger

- - Describe Career Paths Open to Individuals with a Joint Education in Accounting and Information Systems

#### ***Unit: POA17: Partnership Accounting***

Learning Objectives:

- - Describe the advantages and disadvantages of organizing as a partnership
- - Describe how a partnership is created, including the associated journal entries
- - Compute and allocate partners' share of income and loss
- - Prepare journal entries to record the admission and withdrawal of a partner
- - Discuss and record entries for the dissolution of a partnership

#### **The Math of Money**

##### ***Unit: TMM01: The Math of Money***

Learning Objectives:

- - Understand the fundamentals of the macroeconomy, including its components and how they impact financial decisions
- - Acquire essential financial terminology and concepts necessary for discussing and analyzing financial matters
- - Master the fundamentals of balance sheets and their significance in evaluating financial health and making financial decisions

##### ***Unit: TMM02: Debt***

Learning Objectives:

- - Explore the world of credit cards and understand their mechanics, benefits, and potential pitfalls
- - Examine different aspects of automobile financing and grasp the key factors to consider when financing a car
- - Dive into the complexities of mortgages, including terminology and calculations involved in mortgage loans

##### ***Unit: TMM03: Investing and Retirement***

Learning Objectives:

- - Gain insights into the basics of investment, including various investment vehicles and their risk-return profiles
- - Explore the world of stocks, bonds, and mutual funds, understanding how they function and their roles in investment portfolios
- - Develop a comprehensive understanding of retirement planning, including the importance of saving, investment strategies, and types of retirement accounts

**Unit: TMM04: Taxes**

Learning Objectives:

- - Examine non-income taxes, such as property taxes and sales taxes, and understand their impact on personal finances
- - Delve into income tax terminology and forms, learning to navigate the complexities of income tax regulations
- - Solve income tax problems, applying tax rules to real-life scenarios and understanding the implications of various tax strategies

**Unit: TMM05: Insurance**

Learning Objectives:

- - Explore different types of insurance, including health insurance, property insurances, and income insurances, and their roles in managing financial risks
- - Master the concepts and terminologies related to insurance policies and coverage, enabling effective decision-making in insurance matters

**Pointful Education****Career Exploration in Finance****Unit: CEIF 00: Start Here**

Learning Objectives:

- - Completion

**Unit: CEIF 01: Why Pursue a Career in Finance?**

Learning Objectives:

- - Identify the purposes of finance and its impact on society
- - Examine the history of Wall Street
- - Explain the regulation of the securities and investments industry
- - Preview the career paths that will be presented throughout the course (investment banking, sales and trading, private wealth management, and financial planning and analysis)
- - Examine Lehman Brothers, including its history, culture, and current situation

**Unit: CEIF 02: Finance Basics**

Learning Objectives:

- - Employ numbers and operations in finance
- - Describe the nature and scope of accounting

- - Explain securities and investments products and their benefits
- - Perform calculations and analyses on data using a spreadsheet
- - Construct charts/tables/graphs from function and data
- - Discuss the importance of written and verbal communication in finance

#### ***Unit: CEIF 03: Investment Banking***

##### Learning Objectives:

- - Define investment banking and key financial terms regarding mergers and acquisitions
- - Explain the role of valuation in making appropriate financial decision for a company
- - List and evaluate product and industry groups within an investment bank
- - Examine the differences between large (bulge bracket) banks and smaller (boutique) banks
- - Describe the roles and requirements of an investment banking analyst
- - Identify training, education, and certification requirements for investment bankers
- - Align safety issues with appropriate safety standards to ensure a safe workplace

#### ***Unit: CEIF 04: Sales and Trading***

##### Learning Objectives:

- - Define sales and trading and key financial terms regarding trading securities
- - Examine the differences between equities, fixed income, forex, and derivatives
- - Describe the roles and requirements of a sales and trading analyst
- - Evaluate the efficient market hypothesis
- - Describe algorithmic or high-frequency trading and compare it to human traders
- - Discuss legal and ethical considerations in buying and selling securities
- - Examine JP Morgan Chase, including its history, culture, and current situation

#### ***Unit: CEIF 05: Private Wealth Management***

##### Learning Objectives:

- - Define private wealth management
- - Describe the roles and requirements of a private wealth analyst
- - Compare the various platforms that a private wealth analyst could work for
- - Describe investment analysis and selection processes
- - Explain factors to consider when selecting investments
- - Discuss the nature of investment risk
- - Discuss the difference between expected returns of bonds and stocks
- - Select investments for clients
- - Interpret financial ratios significant to investors

- - Discuss the rise of robo-advisors and analyze if it is a threat to private wealth management
- - Examine Bank of America Merrill Lynch, including its history, culture, and current situation

***Unit: CEIF 06: Financial Planning and Analysis***

Learning Objectives:

- - Define financial planning and key terms related to financial statements and financial-information management
- - Describe the roles and requirements of a financial analyst as well as other careers in corporate finance
- - Explain the nature of capital investment
- - Conduct cash flow analysis to select an acceptable capital expenditure
- - Explain how capital market securities are used to secure financing for a company
- - Understand how debt and equity capital are used to raise funds for business growth
- - Explain commerce laws and regulations

***Unit: CEIF 07: High School, College and Internship Preparation***

Learning Objectives:

- - Discuss the importance of grades, extracurricular activities, and leadership experiences in building a strong resume and personal portfolio
- - Describe the role of internships in preparing for a career in finance and identify concrete steps students can take to prepare for internships in high school and college
- - Develop a personal career plan to meet career goals and objectives
- - Evaluate and use information resources to accomplish specific occupational tasks
- - Operate internet applications to perform workplace tasks
- - Examine BlackRock, including its history, culture, and current situation

***Unit: CEIF 08: Networking, Resumes, Cover Letters and Interviews***

Learning Objectives:

- - Demonstrate skills related to seeking and applying for employment to find and obtain a desired job
- - Describe the key components of a resume and compare key components of finance-focused resumes
- - Create a resume and cover letter
- - Discuss the function and importance of networking and informational interviews
- - Describe best practices for preparing for an executing job interviews for finance positions
- - Participate in a mock interview

- - Demonstrate appropriate methods for accepting or rejecting employment offers
- - Discuss the importance of diversity in financial institutions
- - Examine Vanguard, including its history, culture, and current situation

#### *Unit: CEIF 09: Succeeding on the Job*

##### Learning Objectives:

- - Evaluate key factors of success in finance careers
- - Identify traits for retaining employment to maintain employment once secured
- - Examine the importance of leadership and teamwork skills to accomplish organizational goals and objectives
- - Identify and exhibit traits for retaining employment to maintain employment once secured
- - Explain securities and investments licensing and certification programs, including FINRA Series license exams and explain professional designations
- - Discuss the pros and cons of the Chartered Financial Analyst program
- - Describe the nature of the Chartered Financial Analysts (CFA) Institute Code of Ethics and Professional Conduct
- - Examine UBS, including its history, culture, and current situation
- - Describe the importance of “attention to detail” and use correct grammar, punctuation, and terminology to write and edit documents

#### *Unit: CEIF 10: Life After Banking*

##### Learning Objectives:

- - Examine the potential career paths, after entry-level finance jobs, in private equity
- - Examine the potential career paths, after entry-level finance jobs, in hedge funds
- - Examine employment opportunities in venture capital and entrepreneurship
- - Recognize requirements for career advancement to plan for continuing education and training
- - Evaluate graduate school possibilities, including law and MBA programs
- - Examine Carlyle, including its history, culture, and current situation
- - Demonstrate skills in evaluating and comparing employment opportunities in order to accept employment positions that match career goals

#### *Unit: CEIF 11: Course Wrap-up/Final Exam*

##### Learning Objectives:

- - Completion

## Fundamentals of Bitcoin & Cryptocurrency

### *Unit: FBIT 00: Module 0 - Start Here*

Learning Objectives:

- - Completion

### *Unit: FBIT 01: What is Bitcoin? - Introduction*

Learning Objectives:

- - List four definitions of bitcoin and describe what each of them means
- - Identify drivers of the value of bitcoin
- - Examine the historical price of bitcoin and label drivers of major price movements
- - Compare bitcoin with other methods of payment
- - Find the current price of bitcoin and convert bitcoins to US dollars and vice versa
- - Describe the divisibility of bitcoin and how this enables micropayments
- - Recognize the risks of using bitcoin as a currency and as an extremely speculative investment

### *Unit: FBIT 02: Cryptography for Beginners*

Learning Objectives:

- - Describe encryption, decryption, and ciphers
- - Define hash function, algorithm, and one-way function
- - Demonstrate how to get a hash function from a text string input
- - Describe the 3 main properties of a hash function
- - Review exponents and evaluate the importance of mathematics in cryptography
- - Discuss shortcomings of previous attempts at creating a digital currency and why they failed
- - Describe how bitcoin addresses the double spend problem

### *Unit: FBIT 03: Public and Private Keys*

Learning Objectives:

- - Define a cryptographic public key and cryptographic private key
- - Describe how a private and public key pair control ownership of bitcoin
- - Evaluate methods and best practices for securing private keys
- - Demonstrate the use of a digital signature
- - Define multi-sig and explain how this is used to control bitcoin and other cryptocurrencies
- - Identify future career opportunities and pathways in bitcoin



***Unit: FBIT 04: Nodes, Wallets, and Addresses***

## Learning Objectives:

- - Define a bitcoin node
- - Describe the four functions of nodes in the bitcoin network
- - Define a bitcoin address and explain the difference between an address and a wallet
- - Compare a digital wallet with a physical wallet
- - Categorize the five wallet platforms
- - Contrast hardware wallets and software wallets
- - Demonstrate how to open a bitcoin wallet
- - Select a commercial bitcoin wallet provider to evaluate and describe its key characteristics

***Unit: FBIT 05: Bitcoin Mining***

## Learning Objectives:

- - Define bitcoin mining, proof of work, and other key terms related to mining
- - Describe the characteristics of the mathematical puzzle that miners must solve and verify to win a mining round
- - Describe the history and development of bitcoin mining, including the increase in hashing power of the system
- - Evaluate the characteristics of how to make bitcoin mining profitable
- - Examine the incentives of miners and nodes to support the bitcoin network
- - Discuss the pros and cons of the high energy usage required in bitcoin mining

***Unit: FBIT 06: Transacting Bitcoin***

## Learning Objectives:

- - Describe the steps to completing a bitcoin transaction (either receiving money or paying using bitcoin)
- - Demonstrate how to transfer, receive, and spend bitcoin
- - Identify transaction inputs and transaction outputs
- - Explain transaction costs for both buyers and sellers, and compare them across payment methods
- - Contrast the irreversibility of bitcoin transactions with other electronic payment networks
- - Compare the pros and cons of being a bitcoin merchant
- - Describe the Lightning Network and how it is able to reduce transaction costs

***Unit: FBIT 07: Bitcoin Security***

## Learning Objectives:

- - Compare the security of holding value in bitcoin wallets to holding dollars in a bank or in the stock market
- - Evaluate the security of the bitcoin network
- - Describe a 51% attack
- - Examine the vulnerability of the bitcoin network to quantum computing developments
- - Define pseudonymity, anonymity, and privacy in the context of bitcoin transactions
- - Identify best practices of securing personal wallets and bitcoin holdings

#### ***Unit: FBIT 08: Bitcoin and Money***

##### Learning Objectives:

- - Describe the three principle characteristics of money
- - Define monetary system, inflation, and deflation
- - Evaluate give historical examples of hyperinflation
- - Examine the historical types of money
- - List the properties of a strong currency and evaluate Bitcoin's strength based on these properties
- - Discuss the principle of trust associated with various forms of money
- - Research a historical monetary unit, describing and evaluating how it was used as currency

#### ***Unit: FBIT 10: Bitcoin : the Past and the Future***

##### Learning Objectives:

- - List key issues that affect bitcoin's price and network
- - Define a fork and describe the reasons behind past forks in the bitcoin network
- - Differentiate between a hard fork and a soft fork
- - Evaluate the block size debate and identify how the block size affects transaction fees and costs
- - List locations for credible information and updates on bitcoin developments including twitter, reddit, podcasts, and credible news outlets
- - Summarize the potential of bitcoin and blockchain technologies to redefine transfer of value and monetary systems
- - Choose a recent or current issue in cryptocurrencies and describe and evaluate the arguments made by both sides

#### ***Unit: FBIT 09: Altcoins and Regulations***

##### Learning Objectives:

- - Define altcoin and explain features of bitcoin that can be altered
- - Contrast features of bitcoin with other major altcoins such as Litecoin, Dash, and Ripple

- - Define cryptocurrency market capitalization, demonstrate how it is calculated, and look up its current value
- - Evaluate the altcoin Ethereum, describing its features and smart contracts
- - Describe Initial Coin Offering (ICO) and venture capital and compare how they are used to raise money for new projects
- - Examine proposed or existing regulations and discuss how government actions may impact bitcoin and altcoins
- - Choose an altcoin or token and describe its purpose and features

***Unit: FBIT 11: Course Wrap-up/Final Exam***

Learning Objectives:

- - Completion

**Fundamentals of Blockchain and Cryptocurrency**

***Unit: FBC 00: Module 0 - Start Here***

Learning Objectives:

- - Completion

***Unit: FBC 09: Course Wrap-up/Final Exam***

Learning Objectives:

- - Completion

***Unit: FBC 01: Intro to blockchain and The Blockchain***

Learning Objectives:

- - Describe bitcoin, its creation, and how it functions
- - Define blockchain and distributed ledger technology
- - Differentiate between a private and public blockchain, and permission and non-permissioned blockchains
- - Evaluate the principle of trust in society and how blockchain technology enables greater trust
- - List possible applications of blockchain technology

***Unit: FBC 02: Blockchain and Transactions***

Learning Objectives:

- - Describe how ledgers record transactions and examine how double-entry book-keeping paved the way for capitalism
- - Differentiate between centralized and decentralized ledgers

- - Define and give examples of intermediaries in today's economy
- - Explain transaction costs for both buyers and sellers
- - Describe how blockchain-based transactions can improve trust and reduce costs
- - Identify career opportunities in blockchain technology at banks and educational paths to enter those careers

#### ***Unit: FBC 03: Blockchain and Education***

Learning Objectives:

- - Evaluate the size and scope of the problem of fraudulent and fake degrees
- - Compare a blockchain-based credential with a traditional paper-based credential
- - Describe companies and projects that are utilizing blockchain-based credentials
- - Discuss the benefits and risks of using the blockchain for education credentials
- - Examine additional ways that blockchain technology can be used in education beyond credentials

#### ***Unit: FBC 04: Blockchain and Identity - Introduction***

Learning Objectives:

- - Describe the problems of current identity management
- - List the limitations of biometric identification, paper-based documentation, and physical signatures
- - Differentiate between physical and digital identity
- - Define self-sovereign identity
- - Evaluate projects and companies that are creating blockchain-based solutions that help solve global identity problems
- - Discuss the growing field of blockchain jobs and careers in identity management

#### ***Unit: FBC 05: Blockchain and Smart Contracts***

Learning Objectives:

- - List the components of a contract and summarize why contracts are used
- - Provide examples of traditional contracts
- - Describe the problems with traditional contracts, contract law, and enforcement/execution
- - Define smart contract
- - Evaluate how blockchain technology, including the Ethereum blockchain, can be used to create and execute smart contracts
- - List examples of smart contract projects and applications
- - Examine the problems and risks with smart contracts (compared to traditional contracts)

***Unit: FBC 06: Blockchain and Music***

Learning Objectives:

- - Define the problems with the existing music and record label industry
- - Describe how blockchain technology can be used in the music industry
- - Outline the benefits for musicians, artists, and fans by using blockchain based systems
- - Compare some existing blockchain music project and companies
- - Discuss the downsides or problems of using the blockchain for music rather than existing systems

***Unit: FBC 07: Blockchain and Voting***

Learning Objectives:

- - Define the problems with the existing paper and electronic voting systems
- - Describe how blockchain technology can be used in securing digital voting records
- - Outline the potential benefits of blockchain technology when applied to elections and voting
- - Discuss the downsides or problems of using the blockchain for voting rather than existing systems
- - Compare and explain blockchain voting projects and companies

***Unit: FBC 08: Blockchain and Healthcare***

Learning Objectives:

- - Outline the problems with medical records, including data breaches, privacy, and data management
- - Describe how blockchain technology can be used in controlling, securing, and monetizing personal healthcare records
- - Define the healthcare supply chain for medicine and identify problems with the supply chain
- - Evaluate the potential for blockchain to improve the healthcare supply chain
- - Identify career opportunities in healthcare and blockchain technology and educational paths to enter those careers

**Personal Finance*****Unit: Personal Finance 11: Course Wrap-up/Final Exam***

Learning Objectives:

- - Completion

***Unit: Personal Finance 00: Start Here***

Learning Objectives:

- - Completion

***Unit: Personal Finance 01: Money and You: The Role of Individuals and Families in the Global Economy***

Learning Objectives:

- - Identify the importance of financially self-sufficient families to the stability of the American economic system.
- - Identify the role and importance of the consumer in the economic system.
- - Define consumer education terminology, including capitalism, resources, economic system, financial literacy, and supply and demand.
- - Describe the characteristics of a free enterprise system.
- - Summarize the laws of supply and demand and explain their importance in a free enterprise system.

***Unit: Personal Finance 02: Money Decisions: Personal and Family Financial Choices***

Learning Objectives:

- - Discuss the importance of taking responsibility for personal financial decisions and explain how personal financial resources affect the choices people make.
- - Apply a decision-making process to making consumer choices concerning public transportation and vehicle ownership, including leasing versus owning and new versus used.
- - Apply a decision-making process to making consumer choices concerning housing, including renting versus owning.
- - Describe how shared decision-making regarding income allocation and expenditures works in a family setting as well as the interrelationship of time, effort, and money to achieving personal and family goals.
- - Identify the advantages and disadvantages of dual income families.
- - Explain discretionary and disposable income and how it affects personal and family spending.

***Unit: Personal Finance 03: Money Making: Strategies for Creating and Managing Income***

Learning Objectives:

- - Identify sources of income and how career choice, education, and technical skills affect income.
- - Relate personal income goals and financial goals to life events and explain the effects of income on purchasing power.
- - Identify the opportunity cost of various financial decisions, including the costs of time, risk, and resources.

- - Compare the advantages and disadvantages of different payment methods (i.e. digital and mobile, credit cards, automatic withdrawals, cash, bitcoin/digital currencies, etc.)
- - Compare and contrast the cost of living expenses in various locations.

#### ***Unit: Personal Finance 04: Money Help: Services, Functions and Products in the Financial Industry***

##### Learning Objectives:

- - Investigate money management tools (i.e. financial institutions, qualified financial planners, software, digital apps, etc.).
- - Demonstrate knowledge of opening and managing bank accounts (checking and savings).
- - Balance a checking account.
- - Demonstrate knowledge of opening and managing investment accounts (retirement and discretionary).
- - Identify rules and regulations of financial institutions pertaining to the consumer (i.e. FDIC, CFPB Dodd-Frank Act, etc.).

#### ***Unit: Personal Finance 05: Making Informed Buying Decisions***

##### Learning Objectives:

- - Describe the effects of advertising and social media on consumer purchases.
- - Investigate and evaluate consumer information regarding products and services (i.e. Consumer Reports, Yelp/Google/Amazon reviews, Better Business Bureau, etc.).
- - Identify state and federal agencies that provide consumer protection and the rights and responsibilities of buyers and sellers under consumer protection laws.
- - Compare different credit plans such as revolving charge, 90 day, installment accounts, and interest-free.
- - Demonstrate advocacy of personal financial relations with businesses (i.e. contest incorrect billing statements, loss of bank cards, etc.).
- - Understand the implications of one's financial digital footprint (i.e. identify theft, scams, cyber-security, etc.).

#### ***Unit: Personal Finance 06: Money to the Government: Personal Taxation***

##### Learning Objectives:

- - Explain the basic principles of taxation.
- - List types and sources of taxes at the local, state and federal level ((i.e. income, real estate, payroll (both employer and employee), sales, and others)).
- - Identify penalties related to non-payment of income tax and explain the difference between gross and net income.

- - Identify and complete forms used to file taxes (e.g. 1040A, 1040EZ, 1099, W-2, W-4 and bank statements). Calculate various taxes (i.e. FICA, SS, Medicare, Federal withholding, sales tax, etc.).

#### *Unit: Personal Finance 07: Protecting Money: Insurance, Wills, and Contracts*

##### Learning Objectives:

- - Investigate money management tools (i.e. financial institutions, qualified financial planners, software, digital apps, etc.).
- - Recognize basic types of leases, service warranties and general sales/credit contracts that offer consumer protection.
- - Identify reasons for making a will and related documents (i.e. Power of Attorney, Living Will, Health Care Surrogate, etc.) and why they are important in a financial plan.
- - Identify strategies to select qualified professionals and companies that provide insurance products, contracts, real estate and wills.
- - Research the implications of receiving an inheritance.

#### *Unit: Personal Finance 08: Growing Money: Saving and Investing*

##### Learning Objectives:

- - Describe reasons and methods for saving (i.e. emergency fund, pay yourself first, big purchases, sinking funds, etc.).
- - Describe reason (retirement, savings, security) and methods for investing (i.e. mutual funds, stocks, real estate, precious metals, cryptocurrencies, etc.).
- - Describe how to buy and sell investments.
- - Explain investor protection provided by agencies that regulate the financial markets (i.e. FDIC, CFPB, SEC).
- - Explain how inflation affects different types of investments.
- - Identify three global stock or financial exchanges and the types of securities listed on each.
- - Compare and contrast robo advisors (Robinhood) with traditional human advisors.

#### *Unit: Personal Finance 09: Borrowing Money: Consumer Credit and Loans Part I*

##### Learning Objectives:

- - Identify the role consumer credit has in today's economy.
- - Compare sources of consumer credit.
- - Compare sources and application process of consumer loans (i.e. payday loans, student loans, line-of-credit, and auto loans).
- - Analyze the benefits and cost of consumer credit, including student loans.
- - Analyze the risks and consequences of consumer credit (i.e., bankruptcy, foreclosure, co-signing, lower credit score and lower credit worthiness).



***Unit: Personal Finance 10: Money and Risk: Consumer Credit and Loans Part II***

Learning Objectives:

- - Explain factors that affect credit worthiness and determine one's credit score.
- - Explain the alternatives to using consumer credit (i.e., cash, layaway, and planned savings for a large purchase).
- - Identify ways to correct credit problems.
- - Identify credible sources to assist with credit problems.
- - Research credit reporting agencies to check accuracy of one's credit report.
- - Compute interest rates by various mechanisms (i.e. simple, compound, APR)

**Quickbooks*****Unit: Quickbooks 00: Start Here***

No Learning Objectives available.

***Unit: Quickbooks 01: Setting Up and Managing QuickBooks Online***

Learning Objectives:

- - Recognize features and benefits of Intuit QuickBooks Online Plus and describe licensing requirements for setting up an entity in Intuit QuickBooks Online
- - Describe the process of migrating a company to Intuit QuickBooks Online, the access of each default user role and company, and the company information that you can and can't edit.
- - Recognize the benefits of the Close the Books feature as well as compare and contrast the cash and accrual accounting methods
- - Identify the purposes of project tracking, class tracking, and locations and how to activate them.
- - Identify the tasks performed by automation.

***Unit: Quickbooks 02: Managing Lists And Recurring Transactions***

Learning Objectives:

- - Identify the lists that you can import.
- - Identify the content of various lists and the appropriate lists for different purposes.
- - Identify when and how to add, edit, delete, and merge list items.
- - Manage the Chart of Accounts.
- - Describe reasons for making transactions recurring and the types of recurrence.
- - Describe how to implement recurring transactions.

***Unit: Quickbooks 03: Managing Journal Entries and Connecting Intuit QuickBooks to Online Apps***

Learning Objectives:

- - Identify the information required for journal entries
- - Describe how to implement journal entries
- - Identify the purpose of apps
- - Identify where to get apps
- - Identify the risks and benefits of extending functionality through apps

***Unit: Quickbooks 04: Setting Up Customers, Products, and Services***

Learning Objectives:

- - Identify the importance of the Display Name field, billing addresses, and shipping addresses.
- - Define and describe the use of customer payment terms and identify taxable and non-taxable customers.
- - Define and describe the correct use of sub-customers
- - Describe and differentiate between products and services and identify the information required to set them up.
- - Describe reasons for setting-up products or services and contrast inventory products and non-inventory products.

***Unit: Quickbooks 05: Managing Sales Settings and Recording Money-In Transactions***

Learning Objectives:

- - Customize sales forms and email message forms
- - Describe the purpose of activating customer discounts and the purpose of the payment feature and how it differs from traditional payments
- - Describe the money-in transaction workflow
- - Record and manage invoices, sales receipts, credit memos, and refund receipts.
- - Receive, record, and manage payments, undeposited funds, and deposits.

***Unit: Quickbooks 06: Managing Vendor Records and Expense Settings***

Learning Objectives:

- - Describe how to identify existing customers and vendors as well as when and how to merge vendor accounts.
- - Describe how to add or change vendor payment terms and how and why to identify vendors as 1099 contractors.
- - Describe how and why to activate expense tracking by customer.
- - Describe when and how to make expenses and items billable.

- - Describe how to identify unbilled billable expenses.

***Unit: Quickbooks 07: Recording and Managing Basic Money-Out Transactions***

Learning Objectives:

- - Describe the money-out transaction workflow and types of money-out transactions.
- - Compare and describe the appropriate use of checks and bill payments as well as the effects of recording bills, checks, and credit card transactions.
- - Differentiate between expense transactions and bank feed transactions
- - Describe how to record check, credit card, and debit card expense transactions as well as the use and effects of vendor credits and refunds.
- - Describe why and how to void, delete, and edit money-out transactions and the impact thereof.

***Unit: Quickbooks 08: Bank Accounts, Transaction Rules, and Receipts***

Learning Objectives:

- - Identify the types of financial accounts Intuit QuickBooks Online can connect to and the benefits of connecting to those accounts.
- - Process bank feed transactions and describe the use of bank rules.
- - Identify methods for uploading receipts.
- - Describe how to record transactions from uploaded receipts.

***Unit: Quickbooks 09: Basic Reports and Views***

Learning Objectives:

- - Describe the content and purpose of financial reports, money-in reports, and money-out reports.
- - Customize standard reports
- - Identify report delivery formats
- - Describe the content of the Audit Log
- - Describe the content and functionality of the dashboards.
- - Prepare for your QuickBooks Online Certification.

***Unit: Quickbooks 10: Course Wrap-up/Final Exam***

No Learning Objectives available.

## Government & Public Administration

### Open Textbooks

#### AMERICAN GOVERNMENT (2E – SECOND EDITION)

##### *Unit: Chapter 1: American Government and Civic Engagement*

Learning Objectives:

- - Understand What is Government?
- - Understand Who Governs? Elitism, Pluralism, and Tradeoffs
- - Understand Engagement in a Democracy

##### *Unit: Chapter 2: The Constitution and Its Origins*

Learning Objectives:

- - Understand The Pre-Revolutionary Period and the Roots of the American Political Tradition
- - Understand The Articles of Confederation
- - Understand The Development of the Constitution
- - Understand The Ratification of the Constitution
- - Understand Constitutional Change

##### *Unit: Chapter 6: The Politics of Public Opinion*

Learning Objectives:

- - Understand The Nature of Public Opinion
- - Understand How Is Public Opinion Measured?
- - Understand What Does the Public Think?
- - Understand The Effects of Public Opinion

##### *Unit: Chapter 3: American Federalism*

Learning Objectives:

- - Understand The Division of Powers
- - Understand The Evolution of American Federalism
- - Understand Intergovernmental Relationships
- - Understand Competitive Federalism Today
- - Understand Advantages and Disadvantages of Federalism

##### *Unit: Chapter 4: Civil Liberties*

Learning Objectives:

- - Understand What Are Civil Liberties?
- - Understand Securing Basic Freedoms
- - Understand The Rights of Suspects
- - Understand Interpreting the Bill of Rights

***Unit: Chapter 5: Civil Rights***

Learning Objectives:

- - Understand What Are Civil Rights and How Do We Identify Them?
- - Understand The African American Struggle for Equality
- - Understand The Fight for Women's Rights
- - Understand Civil Rights for Indigenous Groups: Native Americans, Alaskans, and Hawaiians
- - Understand Equal Protection for Other Groups

## **Health Science**

### **ATSVR**

#### **ATSVR**

***Unit: VR-01 New User Tutorial***

No Learning Objectives available.

***Unit: VR-02 Triage Tutorial***

No Learning Objectives available.

***Unit: VR-03 Active Shooter Mass Casualty Event: Hospital Emergency Preparedness - Beginner***

No Learning Objectives available.

***Unit: VR-04 Active Shooter Mass Casualty Event: Hospital Emergency Preparedness - Intermediate***

No Learning Objectives available.

***Unit: VR-05 Active Shooter Mass Casualty Event: Hospital Emergency Preparedness - Advance***

No Learning Objectives available.

***Unit: VR-06 Mass Casualty Event Reunification Protocol - Beginner***

No Learning Objectives available.

***Unit: VR-07 Mass Casualty Event Reunification Protocol - Intermediate***

No Learning Objectives available.

***Unit: VR-08 Mass Casualty Event Reunification Protocol - Advance***

No Learning Objectives available.

***Unit: VR-09 Vehicle and Machine Training - Explore***

No Learning Objectives available.

***Unit: VR-10 Vehicle and Machine Training - Beginner***

No Learning Objectives available.

***Unit: VR-11 Vehicle and Machine Training - Intermediate***

No Learning Objectives available.

***Unit: VR-12 Vehicle and Machine Training - Advance***

No Learning Objectives available.

**Certify ED****Biotechnology (Video & VR)*****Unit: Biotechnology - Biotechnology: A Scientific and Legal Perspective***

Learning Objectives:

- - Understand the significance of science in biotechnology.
- - Discuss the historical context in which the field of biotechnology emerged by identifying key scientific developments.
- - Explain the role of patents and licensing processes in new biotechnology innovations.
- - Demonstrate an ability to maintain records in accordance with Intellectual Property Law.
- - Describe the variety of career paths in science that exist in biotechnology.
- - Describe the variety of career paths in the field of biotechnology that are not science related.

***Unit: Biotechnology - Biotechnology Research and Development: A Global Perspective***

Learning Objectives:

- - Describe the unique qualities of a biotechnology research laboratory.
- - Discuss the importance of quality research programs and techniques in biotechnology.
- - Describe experimental design and its role in the biotechnology research laboratory.
- - Compare and contrast a research laboratory with a production industrial laboratory for biomanufacturing.
- - Discuss the regulations involved with manufacturing a biological product and the role of contract manufacturing organizations (CMOs).
- - Explain the global nature of professionalism.

- - Demonstrate the ability to organize, implement, and troubleshoot specific tasks.
- - Discuss the importance of working in teams and respecting differences between different people and cultures.

***Unit: Biotechnology - Scientific Method: Experimental Design, Data Analysis, and Hypothesis Testing***

Learning Objectives:

- - Describe experimental design and proper data analysis.
- - Discuss commonly used statistical terms in data analysis.
- - Describe the nature of scientific inquiry.
- - Distinguish between observations and inferences.
- - Outline the generalized steps of performing hypothesis-based science.

***Unit: Biotechnology - Fundamentals of Laboratory Techniques: The Scientific Method, Buffers, Measurements, and Solutions***

Learning Objectives:

- - Demonstrate the ability to use the scientific method.
- - Define buffer and discuss how buffers are used in biotechnology.
- - Describe the SI system and identify the base units and prefixes used for measurement.
- - Describe how dilutions are created from solutions.
- - Properly prepare buffers and solutions.

***Unit: Biotechnology - Unit Sim***

Learning Objectives:

- - Understand Colony Isolation & Streaking Bacteria
- - Understand Micropipettes
- - Understand Serological Pipettes
- - Understand Making a Molar Solution
- - Understand Spectrophotometry

***Unit: Biotechnology - Recombinant DNA Technology: Principles and Applications***

Learning Objectives:

- - Define and explain recombinant DNA.
- - Discuss recombinant proteins.
- - Demonstrate the concepts of recombinant technology.
- - Describe the chemical structure of DNA and how it is organized in a cell.
- - Explain the process of DNA replication.
- - Describe the DNA purification process.

- - Discuss various methods that are used to analyze DNA.
- - Explain what role DNA plays in biotechnology.
- - Demonstrate the principles of DNA isolation.

***Unit: Biotechnology - Molecular Biology Techniques: PCR, Electrophoresis, and Aseptic Techniques***

Learning Objectives:

- - Describe the process of PCR, including denaturation, annealing, and elongation.
- - List the components of a PCR reaction.
- - Perform Polymerase Chain Reaction (PCR).
- - Perform electrophoresis.
- - Identify various DNA separation techniques.
- - Explain the aseptic techniques that are used to create a sterile environment.
- - Explain the uses of a microbial culture.

***Unit: Biotechnology - Mammalian Cell Biology and Laboratory Techniques***

Learning Objectives:

- - Describe a mammalian cell.
- - Explain how mammalian cell cultures are obtained.
- - Describe laboratory automation.
- - Identify the principles of spectrophotometry in a laboratory.
- - Define and explain bioethics.
- - Demonstrate knowledge of professional ethics.

***Unit: Biotechnology - Laboratory Safety in Biotechnology: A Comprehensive Guide***

Learning Objectives:

- - Describe why safety precautions are important for working in a biotechnology laboratory.
- - List and discuss several important safety measures, such as personal protective devices, that are used in the biotechnology laboratory.
- - List and describe the hazard levels in the laboratory and the handling of hazardous chemicals.
- - Demonstrate use of laboratory hoods for safety and protection.
- - Discuss monitoring of safety regulations by internal or external organizations and why it is important.
- - Demonstrate knowledge of safety regulatory agencies, such as OSHA.

***Unit: Biotechnology - Laboratory Techniques and Equipment Pt. 1***

Learning Objectives:



- - Document lab activities and findings according to guidelines.
- - Demonstrate competency in validating and using laboratory equipment.
- - Demonstrate the proper use of laboratory glassware.
- - Demonstrate the proper use of volumetric equipment.
- - Demonstrate the proper use of balances.
- - Demonstrate the proper use of electrophoresis equipment.

#### ***Unit: Biotechnology - Laboratory Techniques and Equipment Pt. 2***

##### Learning Objectives:

- - Demonstrate the proper use of a spectrophotometer.
- - Demonstrate knowledge of autoclaves.
- - Demonstrate the proper use of centrifuges.
- - Demonstrate the proper use of pH meters.
- - Demonstrate knowledge of thermocyclers.
- - Demonstrate the proper use of temperature regulating devices such as water baths and incubators.
- - Identify and differentiate the different types of microscopes.
- - Demonstrate the proper use of microscopes.
- - Demonstrate knowledge of chromatographic equipment.

#### **Medical Assistant**

#### ***Unit: Medical Assistant - Medical Office Communication and Administration***

##### Learning Objectives:

- - Identify types of verbal and non-verbal communication used to greet, receive, and direct patients and visitors.
- - Define, pronounce and spell common medical terms and abbreviations necessary to safely carry out medical instructions.
- - Prepare and manage patient medical records, such as obtaining and recording patient's demographic data insurance information.
- - Identify various types of health insurance, including the Affordable Care Act, Medicaid, Medicare, and private insurance.
- - Schedule and maintain patient appointment logs, including no-shows, call-backs, reschedules, and cancellations.
- - Explain billing practices, such as insurance forms, terminology, procedure, and diagnosis coding.

#### ***Unit: Medical Assistant - Measuring Patient Health: Height, Weight, and Vital Signs***

##### Learning Objectives:

- - Measure and record height and weight using a variety of measurement systems used in health care.
- - Perform basic addition, subtraction, multiplication, and division used in healthcare.
- - Convert common weights, measures and volumes to metric.
- - Identify body parts and demonstrate knowledge of the function of the basic body parts.
- - Identify the relationship between anatomy, physiology, and pathology.
- - Identify the basic components of the health care delivery system.
- - Demonstrate activation of the Emergency Medical System (EMS).
- - Identify basic medical instruments and equipment.

#### ***Unit: Medical Assistant - Diagnostic Imaging and Procedures***

##### Learning Objectives:

- - Differentiate between the various computer-based diagnostic studies in healthcare, such as X-Ray, MRI, CTScan, and CPET.
- - Explain the procedure to the patient, check for contraindications, locate and count the radial pulse, place the cuff and stethoscope at the correct location, and take blood pressure.
- - Demonstrate proper EKG procedures and other cardiovascular testing.
- - Demonstrate proficiency with laboratory procedures, collecting and preparing specimens, and point-of-care testing such as urinalysis, blood tests, and cultures.
- - Explain biomedical equipment usage and maintenance.
- - Explain and demonstrate hematology procedures.
- - Explain pulmonary function testing procedures.

#### ***Unit: Medical Assistant - Vital Signs and First Aid Procedures***

##### Learning Objectives:

- - Describe types of wounds and the appropriate first aid treatment.
- - Perform aseptic techniques, such as sterilization, sanitation, and disinfection, including how to set up and maintain a sterile field.
- - Perform dressing changes and related first aid.
- - Demonstrate immobilization for suspected fractures, and cast care if fractured.
- - Demonstrate how to conduct a vision screening exam.
- - Demonstrate how to conduct a hearing test using simple tools.
- - Demonstrate how to test the reflexes.

#### ***Unit: Medical Assistant - Unit Sim***

##### Learning Objectives:

- - Discover the blood pressure of a patient
- - Measure a heart rhythm using an ECG machine

- - Perform a visual test on a patient
- - Properly fill out a patient lab form
- - Apply and remove personal protective equipment

#### ***Unit: Medical Assistant - Emergency Care and Patient Preparation***

##### Learning Objectives:

- - Determine the priority of care in an emergency situation.
- - Prepare examination room and organize equipment for patient procedures.
- - Position and drape patient for examination and/or treatment.
- - Assist with patient examinations, transfers, treatments, and minor surgeries.
- - Take vital signs, patient's height and weight, record data and report abnormalities.
- - Identify various documentation formats including paperless charting.

#### ***Unit: Medical Assistant - Pharmacology and Medical Procedures***

##### Learning Objectives:

- - Calculate medication dosages and administration routes.
- - Identify various drugs, drug classifications, and clinical indications.
- - Monitor supply of controlled substances.
- - Explain intradermal testing, such as Mantoux and allergy tests.
- - Describe first aid for foreign objects in the eye and ear and perform irrigation and/or lavage.
- - Perform suture and staple removal.
- - Identify commonly administered drugs, their uses and effects.

#### ***Unit: Medical Assistant - Emergency Care and Procedures***

##### Learning Objectives:

- - Identify classifications of burns and their appropriate treatment.
- - Explain the use of and procedures for nebulizer treatments.
- - Perform basic first aid and identify CPR/AED basic principles
- - Explain the use of pressure points to control bleeding.
- - Describe first aid for choking.
- - Describe urinary catheterization procedures

#### ***Unit: Medical Assistant - Patient Care: Nutrition, Wellness, and Specialized Populations***

##### Learning Objectives:

- - Describe basic nutrition principles, therapeutic diets, and health and wellness practices
- - Explain the importance of cultural diversity awareness and holistic modalities.

- - Identify the stages of growth and development.
- - Demonstrate knowledge of assistive devices.
- - Communicate discharge instructions.
- - Identify a subjective and objective assessment and plan for each patient.
- - Identify special considerations for pediatric, disability, disease progression, geriatric patients

***Unit: Medical Assistant - Infection Control and Safety Protocols in Medical Assisting***

Learning Objectives:

- - Perform proper handwashing technique.
- - Demonstrate proper application and disposal of Personal Protective Equipment, such as gloves, gown, mask, and goggles.
- - Demonstrate the use of basic body mechanics technique.
- - Demonstrate how to prevent accidents, injuries and infection in accordance with OSHA standards.
- - Apply infection control techniques designed to prevent the spread of diseases to the care of all patients following Centers for Disease Control (CDC) guidelines.
- - Demonstrate knowledge of safety data sheets (SDS).
- - Demonstrate knowledge of handling and disposal of contaminated materials or spills.
- - Recognize types of poisoning and treatment.

***Unit: Medical Assistant - Bloodborne Pathogens, Patient Rights, and Legal Considerations***

Learning Objectives:

- - Distinguish between fact and fallacy about the transmission and treatment of diseases caused by blood borne pathogens.
- - Identify community resources and services available to the individual with diseases caused by blood borne pathogens.
- - Identify at risk behaviors which promote the spread of HIV/AIDS and the public education necessary to combat the spread of diseases caused by blood borne pathogens.
- - Discuss how HIPAA regulations affect the privacy of electronic health records.
- - Identify and apply principles related to patient rights, HIPAA, confidentiality, privacy, security, and protected health information regulations, including both electronic and written.
- - Explain how the "Good Samaritan" Law protects the first responder in emergency situations.
- - Identify members of an interdisciplinary healthcare team and know scope of practice for each.
- - Identify and adhere to legal documents, standards, statutes, and regulations, including advance directives, DNR, and healthcare proxy.

- - Identify and adhere to work ethics and professional standards.
- - Explain the five rights of medication safety.

### **Nursing Assistant (Video & VR)**

#### ***Unit: Nursing Assistant - Nursing Assistant Professional Roles and Responsibilities***

##### Learning Objectives:

- - Identify appropriate scope of practice for nursing assistants.
- - Identify workplace skills required for nursing assistants in the healthcare industry.
- - Identify appropriate health maintenance practices for nursing assistants.
- - Utilize verbal and written information to assist with the patient's plan of care.
- - Modify communication techniques for patients with special needs, and language barriers.
- - Identify medical terms and abbreviations consistent with the nursing field.

#### ***Unit: Nursing Assistant - Patient Safety and Infection Control***

##### Learning Objectives:

- - Document, report, and maintain accurate patient information.
- - Demonstrate the understanding of vulnerable population abuse and reporting procedures per agency.
- - Demonstrate knowledge of basic principles of infection control, including standard and transmission-based precautions and PPE.
- - Properly identify, handle, and dispose of hazardous and infectious material.
- - Identify and respond appropriately to existing and potential hazards including fires, electrical safety, and falls.
- - Demonstrate proper hand hygiene techniques.
- - Differentiate between medical asepsis and surgical asepsis for sterilization.

#### ***Unit: Nursing Assistant - Vital Signs, Patient Transfers, and Basic Body Structure***

##### Learning Objectives:

- - Demonstrate ability to accurately measure, record and report vital signs.
- - Assist with the admission of a patient or resident.
- - Assist with transfer of patient.
- - Assist with discharge of patient.
- - Recognize basic body structure and identify function including limited diseases, signs, symptoms, and conditions when assisting a patient.

#### ***Unit: Nursing Assistant - Vital Signs and Patient Preparation***

##### Learning Objectives:

- - Measure and record patient's height, weight, and BMI.
- - Assist with basic emergency and first-aid procedures.
- - Identify and prepare patient and supplies for medical procedures and tests.
- - Provide instructions for and assist in collection of patient specimens.
- - Assist patient in passive range-of-motion exercises.

#### ***Unit: Nursing Assistant - Unit Sim***

##### Learning Objectives:

- - Demonstrate wheelchair assistance
- - Perform a modified bed bath
- - Identify basic body parts
- - Obtain and record standard vital signs
- - Apply and remove personal protective equipment

#### ***Unit: Nursing Assistant - Personal Care and Hygiene: Bathing, Grooming, and Bed Making***

##### Learning Objectives:

- - Give bed bath; observe and report changes in patient including skin and level of consciousness.
- - Assist with shower or tub bath, including the use of specialty tubs.
- - Groom patient, including hair, skin, foot, hand, and nail care.
- - Assist with and administer oral hygiene including denture care.
- - Assist patient to dress.
- - Make unoccupied or occupied bed.

#### ***Unit: Nursing Assistant - Nutrition and Hydration in Nursing Care***

##### Learning Objectives:

- - Assist patient with meals.
- - Identify nutrients and food groups.
- - Prepare a basic food plan.
- - Check patient's diet tray for accuracy.
- - Identify methods of maintaining fluid balance including forcing and restricting fluids.
- - Demonstrate awareness of pain management including comfort measures.

#### ***Unit: Nursing Assistant - Patient Comfort and Well-being: Toileting, Mental Health, and Special Needs Care***

##### Learning Objectives:

- - Assist patient with toileting and elimination needs.
- - Recognize and report changes in altered patient mental status.

- - Identify common alterations in elderly patient behavior.
- - Identify appropriate nursing assistant response to inappropriate behavior from patients.
- - Provide care for patients with special needs, such as impaired hearing, impaired vision, immobility, impaired body functions, cognitively impaired, and dementia.

#### *Unit: Nursing Assistant - Behavioral Management and End-of-Life Care in Nursing Assistance*

##### Learning Objectives:

- - Create and follow established Plan of Care (POC) for behavior management.
- - Recognize and respond appropriately to symptoms of common diseases, including dementia, depression, suicide, and Alzheimer's.
- - Demonstrate awareness of common behaviors in drug use and abuse in the elderly.
- - Demonstrate an understanding of end of life care, hospice, and palliative care.

#### *Unit: Nursing Assistant - Mobility and Transfer Techniques*

##### Learning Objectives:

- - Assist patient in ambulation, including the use of crutch, cane, or walker.
- - Assist patient to dangle.
- - Assist patient in using wheelchair.
- - Assist patient with care and use of prosthetic and orthotic devices.
- - Assist and perform patient transfer using mechanical lifts.
- - Demonstrate the proper use of a gait belt in both transfer and ambulation.
- - Transfer patient to stretcher.
- - Apply comfort devices as directed, including foot-boards, overbed cradles, and alternating pressure mattresses.
- - Assist with patient oxygen needs.

#### *Unit: Nursing Assistant - Legal and Ethical Considerations in Nursing Assistance*

##### Learning Objectives:

- - Demonstrate understanding of HIPAA regulations regarding privacy and confidentiality.
- - Demonstrate legal and ethical behavior within the role and scope of nursing assistant responsibilities.
- - Demonstrate awareness of Patient Bill of Rights.
- - Demonstrate proper security and care for personal possessions of patients.
- - Describe the purpose of the chain of communication in resolving patient or employee problems.
- - Recognize legal issues involving physical and chemical restraints including alternative solutions.

- - Identify OBRA requirements for maintaining nursing assisting certification.

## Medcerts

### Introduction to Human Anatomy & Medical Terminology

#### *Unit: Introduction to Human Anatomy & Medical Terminology*

No Learning Objectives available.

### Medical Coder & Biller Certification Course

#### *Unit: Professionalism in Allied Health (v21.12) PS1011*

Learning Objectives:

- - Gain an understanding of the expectations of an allied healthcare professional in the workplace
- - Develop and exercise emotional intelligence, self-management, and interpersonal skills
- - Build and improve internal and external communication skills with all exchanges
- - Enhance the patient care experience with successful interactions and patient satisfaction
- - Maintain solution-oriented conversations, manage conflict, and build self confidence

#### *Unit: Pharmacy Technician Principles & Practices (v23.1) HI1017*

Learning Objectives:

- - Comply with pharmacy laws, HIPAA/HITECH, CMS, and other healthcare regulations
- - Verify medication orders, calculate and measure dosage and prepare and package medications
- - Apply knowledge of pharmacology, documentation, and inventory management in the pharmacy
- - Adhere to patient-safety, medication-safety, and effective infection control practices
- - Know current pharmacy laws and medication regulations
- - Understand the primary functions of different pharmacy organizations
- - Know the top 200 medications and their purpose
- - Understand the different roles of the pharmacy technician
- - Perform tasks in and around the pharmacy

#### *Unit: Insurance and Billing, and Coding Essentials (v24.7) HI1015*

Learning Objectives:

- - Describe the phases of the revenue cycle and gain an understanding of basic insurance technology
- - Demonstrate knowledge of confidentiality and billing laws, regulations, and standards



- - Explain verification of patient financial responsibility and insurance information
- - Differentiate government and commercial insurance plans and determine which is primary
- - Apply ICD-10-CM, CPT, and HCPCS codes and modifiers based on coding guidelines
- - Discuss capture of information and complete CMS-1500 or HIPAA 837P claims

***Unit: Introduction to Human Anatomy & Medical Terminology (v22.10) HI1014***

Learning Objectives:

- - Analyze and understand medical terminology
- - Recognize the structure and function of human body systems and organs
- - Gain an understanding of the medical language related to body systems
- - Discuss major diseases and related symptoms
- - Prepare to demonstrate medical language knowledge within the healthcare setting

***Unit: Medical Office Procedures & Administration (v23.3) HI1011***

Learning Objectives:

- - Discuss the role and responsibilities related to medical front office procedures
- - Recognize the importance of HIPAA and HITECH compliance laws
- - Describe the use and function of practice management and electronic health record software
- - Gain understanding of the importance of patient education
- - Demonstrate knowledge of patient scheduling
- - Explain the various aspects of insurance and reimbursement

***Unit: Electronic Health Records (v20.6) HI1018***

Learning Objectives:

- - Accumulate transferrable skills as applicable to the use and function of electronic health record and practice management applications
- - Maintain confidentiality and adhere to HIPAA and HITECH privacy and security requirements throughout the workflow
- - Implement accuracy and completeness of documentation to positively affect patient safety and the revenue cycle
- - Recognize diagnosis and procedure codes used in the medical record and their contribution to reimbursement
- - Generate statistical, financial, and census reports

## Professionalism in Allied Health

### *Unit: Professionalism in Allied Health*

No Learning Objectives available.

## MissionCIT

### Emergency Medical Responder - MissionCIT

#### *Unit: EMR CH E01: EMS Systems*

Learning Objectives:

- - History and evolution of EMS systems: Understand the factors that led to the creation of modern EMS systems and the principles of resource management, regulations, and policies that govern EMS services.
- - EMS licensure, education, and oversight: Identify the different levels of EMS licensure, understand the National EMS Education Agenda for the Future, and explain the role of oversight and clinical protocols in ensuring quality care.
- - Roles and responsibilities of EMS personnel: Understand the principles of safety, patient assessment, and emergency care in EMS, as well as the importance of integration with other professionals, administrative support, and professional development.
- - Characteristics of professional behavior in EMS: Describe the different characteristics of professional behavior in EMS, their importance in practice, and the principles of patient advocacy, certification, and personal responsibility.
- - System for continually evaluating and improving care: Explain the principles of continuous quality improvement in EMS and the dynamic process of evaluating and improving EMS care.
- - Patient safety in EMS: Identify high-risk activities in patient safety in EMS, understand how errors happen and how to prevent them through environmental factors, clear protocols, and reflection in action.

#### *Unit: EMR CH E02: The Well-Being of the Emergency Medical Responder*

Learning Objectives:

- - Evidence-Based Decision-Making: Understand the importance of using evidence-based decision-making in EMS practice.
- - Standard Safety Precautions: Demonstrate adherence to standard safety precautions, including hand washing, environmental control, and safe operation of EMS equipment.
- - Personal Protective Equipment: Understand the importance of personal protective equipment in preventing occupational hazards.

- - Stress Management: Understand the different types of stress reactions, and learn stress management techniques such as lifestyle changes and seeking professional assistance.
- - Prevention of Work-Related Injuries: Understand how to prevent work-related injuries by practicing safe lifting techniques, maintaining physical fitness and nutrition, and following Standard Precautions/OSHA regulations.
- - Lifting and Moving Patients: Understand the guidelines for lifting and moving patients, including lifting techniques, safety precautions, and the use of equipment such as stretchers and cots.
- - Patient Positioning: Understand the principles of patient positioning, including different positioning techniques for patients with varying medical conditions.
- - Wellness Principles: Understand the importance of physical and mental wellbeing in EMS, including physical fitness, sleep, disease prevention, and stress management.
- - Medical Restraint: Understand the use of medical restraint and the principles of the Use of Force Doctrine in EMS.
- - Disease Transmission: Understand the principles of disease transmission prevention in EMS.

#### *Unit: EMR CH E03: Medical Ethics*

##### Learning Objectives:

- - Consent/Refusal of Care: Understand the different types of consent, legal complications related to consent, and the importance of proper documentation in providing care and ensuring patient safety.
- - Confidentiality: Explain the obligation to protect patient information, the Health Information Portability and Accountability Act (HIPAA), the different types of legally mandated reporting requirements, and the potential consequences of breach of confidentiality.
- - Advanced Directives: Understand the Patient Self-Determination Act, the different types of advanced directives, and the importance of respecting patient autonomy and wishes.
- - Tort and Criminal Actions: Understand the different types of criminal and civil tort actions in EMS, the concept of negligence and the elements that comprise it, the potential defenses against liability, and the importance of mandatory reporting in certain situations.
- - Evidence Preservation: Understand the importance of preserving evidence in EMS, including the different types of evidence that may be relevant in a given situation.
- - Statutory Responsibilities: Understand the legal and statutory responsibilities of EMS personnel, including the need to follow established protocols and guidelines, maintain proper documentation, and comply with reporting requirements.

- - Mandatory Reporting: Understand the situations in which mandatory reporting is required, including cases of abuse, neglect, and other forms of misconduct.
- - Ethical Principle/Moral Obligations: Understand the difference between ethics and morals, the importance of applying ethical values in EMS, and the potential ethical conflicts that may arise in providing care.

#### ***Unit: EMR CH E04: Communications and Documentation***

##### Learning Objectives:

- - Understand the importance of the minimum dataset in patient care documentation.
- - Identify the different patient information that should be included in a prehospital care report, including administrative information, vital signs, and patient demographics.
- - Explain the functions of a prehospital care report, including continuity of care and legal documentation.
- - Describe the different types and sections of a prehospital care report.
- - Understand the state reporting requirements and confidentiality policies in documentation.
- - Explain how to avoid falsification issues and correct errors in medical documentation.
- - Describe the specific areas of difficulty in documentation and how to document patient refusal.
- - Explain how to complete a prehospital care report in special situations, including multiple-casualty incidents and exposure or injury situations.
- - Understand the uses and types of continuous quality improvement in EMS.
- - Identify the sections in a prehospital care report for evaluating and improving EMS care
- - Understand the goal of providing a report prior to departing from the hospital and the minimum data set that should be included.
- - Know how to keep a copy of the transfer report for reference during the primary prehospital care report and submit the copy with the final prehospital care report.

#### ***Unit: EMR CH E05: Anatomy and Physiology***

##### Learning Objectives:

- - Identify the anatomical planes and standard anatomic terms used to describe body systems.
- - Describe the skeletal components and joints of the body.
- - Explain the function of different types of muscles and the respiratory system.
- - Describe the structures and function of the circulatory system, including blood components and the nervous system.
- - Explain the structure and function of the integumentary, digestive, endocrine, renal, and reproductive systems.

- - Understand the fundamental elements of oxygenation, perfusion, glucose, and waste product removal.
- - Explain the issues impacting fundamental elements, such as air composition, airway patency, ventilation mechanics, respiration regulation, and gas transport.
- - Understand the effects of blood volume, heart effectiveness, vessel size, and acid on cells and organs.
- - Understand the age-related variations in anatomy and body functions for pediatric and geriatric patients.
- - Explain how these variations affect life support chain elements and the delivery of emergency medical care.

**Unit: EMR CH E06: Pathophysiology & Shock**

Learning Objectives:

- - Composition of Ambient Air: Describe the various components of ambient air, including oxygen, nitrogen, and carbon dioxide, and understand the significance of the fraction of inspired and delivered oxygen.
- - Patency of the Airway: Understand the anatomical considerations and potential obstructions at various levels of the airway, including the nasopharynx, oropharynx, pharynx, larynx, trachea, and bronchi.
- - Respiratory Compromise: Understand the changes in the structure and function of the thorax, pleural lining, and muscles of ventilation that can cause respiratory compromise, and the effects of inadequate tidal volume and respiratory rate.
- - Alteration in Regulation of Respiration Due to Medical or Traumatic Conditions: Understand the role of chemoreceptors, stretch receptors, and medulla rhythm centers in regulating respiration, and the effects of arterial carbon dioxide and oxygen content on respiration rate and depth.
- - Ventilation/Perfusion (V/Q) Ratio and Mismatch: Understand the relationship between ventilation and perfusion in the lungs and how disturbance in V/Q ratio can cause hypoxemia.
- - Perfusion and Shock: Understand the composition of blood, distribution of blood volume, and the role of hydrostatic pressure and plasma oncotic pressure in perfusion, and the factors that can impair cardiac output and cause shock.
- - Microcirculation: Understand the influence of local, neural, and hormonal factors on capillary function and blood pressure.
- - Blood Pressure: Understand the role of cardiac output, systemic vascular resistance, and baroreceptors in blood pressure regulation, and the effects of changes in cardiac output and systemic vascular resistance on blood pressure.
- - Alteration of Cell Metabolism: Understand the difference between aerobic and anaerobic metabolism, the effects of an acidic environment on cell structure and function, and the effects of inadequate perfusion on cell metabolism and function.

***Unit: EMR CH E07: Life Span Development***

## Learning Objectives:

- - Infancy (Birth to 1 Year): Identify and understand the vital signs, physiological and immunological development, and psychosocial behaviors of infants during their first year of life.
- - Toddler (12 to 36 Months) and Preschool Age (3 to 5): Recognize the physiological and cognitive development of toddlers and preschool-age children, their vital signs, toilet training patterns, and psychosocial behaviors.
- - School-Age Children (6 to 12 Years): Understand the physiological changes in school-age children, including vital signs and tooth replacement, and the development of self-concept and self-esteem.
- - Adolescence (13 to 18 Years): Recognize the physiological changes in adolescents, including vital signs, growth spurt, endocrine changes, and psychological development, including peer pressure and self-destructive behaviors.
- - Early Adulthood (20 to 40 Years): Identify and understand the physiological and psychological changes in early adulthood, including peak physical conditioning, job stress, and romantic love.
- - Middle Adulthood (41 to 60 Years): Recognize the physiological changes in middle adulthood, including vital signs, cardiovascular health, weight control, and hearing and vision changes, and the psychological challenges of empty nest syndrome and financial burdens.
- - Late Adulthood (61 Years and Older): Understand the physiological changes in late adulthood, including vital signs, cardiovascular and respiratory changes, sensory losses, and endocrine and gastrointestinal changes, and the psychological challenges of declining well-being and financial burdens.

***Unit: EMR CH E08: Lifting and Moving Patients***

## Learning Objectives:

- - Understand Basic Principles of Lifting and Moving Patients
- - Understand Equipment and Tools
- - Understand Patient Safety

***Unit: EMR CH E09: Medication Administration | Narcan***

## Learning Objectives:

- - Administration versus Assistance of Medications: Differentiate between administering medications and assisting patients in taking prescribed medications.
- - Medical Direction: Explain the role of medical direction in medication administration and the difference between off-line (standing orders, written protocols) and on-line (verbal order) medical direction.

- - Confirmation and Clarification: Use the echo technique to confirm medication orders and clarify any confusion regarding medication administration.
- - Medication Administration Procedure: Follow the "rights" of drug administration to ensure safe and effective medication administration (right patient, right medication, right route, right dose, right time).
- - Techniques of Medication Administration: Explain the advantages and disadvantages of different medication administration techniques (oral, sublingual, intramuscular injection by auto injector, inhalation) and use appropriate techniques based on patient condition.
- - Reassessment: Reassess the patient after medication administration to evaluate the data (indications for medication), action (medication administered), and response (effect of medication).
- - Documentation: Document medication administration accurately and appropriately to ensure continuity of care and legal compliance.

#### ***Unit: EMR CH E11: Airway management***

##### Learning Objectives:

- - Understand the anatomy of the upper and lower airway tract, including the functions and structures of the nose, mouth, tongue, jaw, pharynx, larynx, epiglottis, vocal cords, thyroid cartilage, cricoid ring, trachea, bronchi, bronchioles, and alveoli.
- - Describe the pulmonary capillary beds and how they function in the exchange of oxygen and carbon dioxide.
- - Identify the signs of adequate and inadequate airway and their corresponding conditions (e.g., open airway, speaking in full sentences, unusual breathing sounds, tongue or airway obstruction, swelling due to trauma or infection).
- - Explain the techniques used to assure a patent airway, including manual airway maneuvers and mechanical airway devices.
- - Describe the purpose, indications, contraindications, complications, and procedures of nasopharyngeal airway maneuvers.
- - Explain the procedures for relief of foreign body airway obstruction and upper airway suctioning.
- - Understand the age-related variations in airway assessment and management for pediatric and geriatric patients.

#### ***Unit: EMR CH E12: Respiration and Artificial Ventilation***

##### Learning Objectives:

- - Explain oxygen therapy in patients with suspected acute coronary syndrome
- - Oxygenation of chest pain and stroke patients

***Unit: EMR CH E14: Patient Assessment***

## Learning Objectives:

- - Size-up the scene and determine if additional or specialized resources are required
- - Quickly identify and protect oneself from violent or hazardous situations
- - Assess the patient to understand the problem, so appropriate care can be given

***Unit: EMR CH E17: Psychiatric and Behavioral Emergencies***

## Learning Objectives:

- - Define and differentiate between behavior, psychiatric disorder, and behavioral emergency.
- - Identify the epidemiology of psychiatric disorders and the importance of assessing general appearance, speech, skin, posture/gait, mental status, mood, thought, perception, judgment, memory, and attention.
- - Understand the factors that may alter a patient's behavior and the common causes of behavioral alteration, including low blood sugar, lack of oxygen, hypoperfusion, head trauma, mind-altering substances, and withdrawal of drugs or alcohol.
- - Recognize the signs and symptoms of acute psychosis, depression, and suicide risk, including ideation or defined lethal plan of action which has been verbalized and/or written, alcohol and substance abuse, purposelessness, anxiety, agitation, withdrawal from friends and family, and dramatic mood changes.
- - Identify important questions and interventions for managing psychiatric emergencies, including agitated delirium, patient assessment, calming techniques, and transport considerations.
- - Understand the types of restraints and transport against the patient's will, as well as age-related variations in pediatric and geriatric assessment and management, including the risks of teenage suicide, aggressive behavior as a symptom of an underlying disorder or disability, and suicide issues/depression in geriatric patients.

***Unit: EMR CH E19: Trauma***

## Learning Objectives:

- - Identify and categorize trauma patients based on the National Trauma Triage Protocol and the Centers for Disease Control and Prevention's guidelines for field triage of injured patients.
- - Understand the pathophysiology of blunt and penetrating trauma, including high, medium, and low velocity penetrating trauma.
- - Conduct a thorough assessment of the trauma patient, including standard precautions, scene size-up, primary and secondary assessments, and reassessment, while considering mechanisms of injury, baseline vital signs, and history.



- - Perform a primary survey to assess airway, breathing, circulation, and disability, and provide appropriate interventions as needed.
- - Conduct a secondary assessment, including a head-to-toe physical exam and trauma scoring, to identify potential injuries and provide appropriate interventions.
- - Manage the trauma patient by providing rapid transport, selecting appropriate destinations based on trauma system components and hospital categorizations, and considering transport considerations such as scene time and air versus ground transport.

#### *Unit: EMR CH E21: Soft Tissue Trauma*

##### Learning Objectives:

- - Learn about the incidence, mortality, and morbidity of soft tissue injuries and burn injuries.
- - Understand the anatomy and physiology of soft tissue injuries, including layers of the skin, function of the skin, and types of soft tissue injuries such as contusions, hematomas, and crush injuries.
- - Recognize the signs and symptoms of open and closed soft tissue injuries and learn how to assess and manage them, including preventing infection, controlling hemorrhage, and preventing shock.
- - Identify different types of burns, such as thermal, inhalation, chemical, electrical, and radiation burns, and understand the severity and depth classifications of burns, body surface area affected, and complications of burn injuries.
- - Develop knowledge on general assessment and management of soft tissue and burn injuries, including airway management, respiratory distress, dressing and bandaging, and transportation to an appropriate facility.
- - Understand specific management considerations for different types of burn injuries and age-related variations, such as pediatric and geriatric considerations.

#### *Unit: EMR CH E22: Head, Facial, Neck, and Spine Trauma*

##### Learning Objectives:

- - Understand the incidence, mechanisms, and associated injuries of head, face, and neck injuries from various causes.
- - Identify and assess injuries to the scalp, face, eyes, nose, mouth, throat, and neck, including airway compromise and cervical spine injury.
- - Manage and stabilize injuries to the head, face, and neck, including bleeding control, airway management, immobilization, and transport considerations.
- - Recognize signs and symptoms of brain injury, including increased intracranial pressure, and implement appropriate management.

- - Differentiate between types of intracranial hematoma and concussion, and manage accordingly.
- - Understand age-related variations in head, face, and neck injuries, including modifications for pediatric and geriatric patients.

**Unit: EMR CH E23: Environmental Emergencies**

Learning Objectives:

- - Learn to assess and manage patients who suffer from drowning or submersion incidents, including hypoxia, cold water submersion, and spinal trauma.
- - Recognize and treat cold- and heat-related illnesses, such as hypothermia, frostbite, heat stroke, and dehydration.
- - Bites and envenomations: Identify and manage bites and envenomations from spiders, snakes, and insects, including anaphylactic reactions.
- - Understand the mechanism of injury, signs and symptoms, and appropriate management for dysbarism in SCUBA divers.
- - Know how to assess and manage patients with electrical injuries, including recognizing the risk of cardiac arrest.
- - Understand the effects of radiation exposure and appropriate management strategies.
- - Recognize the unique assessment and management considerations for pediatric and geriatric patients.

**Unit: EMR CH E24: Obstetrics and Childbirth**

Learning Objectives:

- - Understand the anatomy and physiology of the female reproductive system, including the uterus, cervix, ovaries, vagina, and breasts.
- - Recognize the cultural values affecting pregnancy and special considerations of adolescent pregnancy.
- - Identify normal anatomical, physiological, and psychological changes during pregnancy, including reproductive, respiratory, cardiovascular, and musculoskeletal systems.
- - Recognize premonitory signs of labor, stages of labor and delivery, and antepartum and intrapartum assessment findings.
- - Develop skills to manage a normal delivery obstetrical patient, including treatment modalities and postpartum care.
- - Recognize and manage complications of pregnancy, such as abuse, substance abuse, bleeding, abortion, ectopic pregnancy, placental problems, and hypertensive disorders.
- - Understand high-risk pregnancy, including precipitous labor and birth, post-term pregnancy, meconium staining, multiple gestation, and intrauterine fetal death.

- - Identify and manage complications of labor, such as premature rupture of membranes and preterm labor.
- - Recognize and manage complications of delivery, such as cephalic presentation, breech, nuchal cord, and prolapse of cord.

#### *Unit: EMR CH E25: Medical Terminology*

##### Learning Objectives:

- - Medical Terminology: Understand the different types of medical terminology including prefixes, root words, suffixes, and combining forms.
- - Medical Terms Associated with Body Structure: Identify medical terms associated with different parts of the body including bones, muscles, organs, and tissues.
- - Medical Terms Associated with Body Systems: Identify medical terms associated with different body systems including the cardiovascular, respiratory, digestive, and nervous systems.
- - Medical Terms Associated with Body Direction or Position: Identify medical terms associated with different body directions and positions including anterior, posterior, medial, and lateral.
- - Standard Medical Abbreviations and Acronyms: Identify standard medical abbreviations and acronyms used in healthcare settings and understand their meanings.

#### *Unit: EMR CH E26: Pediatrics*

##### Learning Objectives:

- - Understand the differences in anatomy and physiology between pediatric and adult patients, including the size and structure of the head, airway, chest and lungs, abdomen, and extremities.
- - Recognize the implications for healthcare providers in caring for pediatric patients, such as the increased risk of blunt head trauma, difficulty securing the airway, and vulnerability to internal injuries.
- - Develop skills to assess and manage pediatric patients with consideration for their unique anatomy and physiology, including effective diaphragmatic excursion, careful monitoring of internal organs, and minimizing the risk of injury to growth plates.
- - Describe the integumentary differences in pediatric patients, including larger surface area, increased susceptibility to burns, and risk of hypothermia.
- - Identify the respiratory system differences in pediatric patients, such as higher oxygen demand and smaller lung reserves, and their implications for healthcare providers.
- - Explain the nervous system and spinal column differences in pediatric patients, including fragile brain tissue, a small subarachnoid space, and the risk of hypoxia and hypotension in head injury cases.

- - Discuss the metabolic differences in pediatric patients, including limited glucose stores and increased susceptibility to hypothermia in newborns and infants.
- - Identify the physical, cognitive, and emotional development milestones of pediatric patients in different age ranges, and their implications for healthcare providers in terms of potential health issues and appropriate communication and treatment strategies.
- - Understand the physical, cognitive, and emotional development during adolescence and the implications for healthcare providers.
- - Recognize and manage respiratory distress, upper and lower airway obstruction, shock, altered mental status, seizures, closed head injury, vomiting, diarrhea, and toxicology in pediatric patients.
- - Identify the risk factors and assessment criteria for sudden infant death syndrome (SIDS) and provide appropriate management.
- - Respond to pediatric trauma by performing a focused history and physical exam, identifying life-threatening injuries, and providing appropriate care.

**Unit: EMR CH E27: Geriatrics**

Learning Objectives:

- - Identify anatomical and physiological changes in the cardiovascular system of elderly patients, including degeneration of valves, conduction system, and muscular changes.
- - Recognize signs and symptoms of myocardial infarction, dysrhythmias, and chest pain in elderly patients, as well as changes in physical assessment, circulation, and breath sounds.
- - Treat cardiovascular conditions in elderly patients with appropriate airway, ventilatory, and circulatory support and oxygen adjuncts, and evaluate patient treatment through reassessment.
- - Assess respiratory changes in elderly patients, including loss of elastic recoil and alveoli, decreased cough reflex, and pneumonia caused by bacterial, viral, or fungal infection.
- - Recognize associated signs and symptoms of respiratory conditions in elderly patients, such as exertional dyspnea, productive cough, wheezing, and headache.
- - Evaluate respiratory pathophysiology in elderly patients through history, risk factors, and current medications, and provide appropriate airway, ventilatory, and circulatory support and oxygen adjuncts.
- - Identify signs and symptoms of delirium, including disorganized thoughts, hallucinations, and reduced level of consciousness, and evaluate pathophysiology through history, risk factors, and current medications.
- - Assess and treat gastrointestinal bleeding caused by disease processes, inflammation, infection, and obstruction of the upper and lower gastrointestinal tract, using appropriate airway, ventilatory, and circulatory support and oxygen adjuncts.

- - Recognize musculoskeletal changes in elderly patients, including atrophy of muscles and muscle wasting, degenerative changes and loss of bone, degenerative changes in joints, and thinning of cartilage and thickening of synovial fluid.
- - Identify toxicological emergencies in elderly patients and understand the pathophysiological changes that make them more susceptible to toxicity, such as decreased kidney function and altered gastrointestinal absorption.
- - Assess sensory changes in elderly patients, including decreased visual acuity, inability to differentiate colors, decreased night vision, decreased tear production, and presbycusis, and understand disease processes such as glaucoma and macular degeneration.

#### ***Unit: EMR CH E28: Patients with Special Challenges***

##### Learning Objectives:

- - Understand the different types of child and elder abuse and neglect, assessment and management principles, and legal and documentation aspects.
- - Advocate for patient rights and appropriate care, identify facilities that treat regardless of payment, be familiar with community assistance resources, and recognize the increased probability of disease.
- - Recognize the increased risk for diabetes, hypertension, heart disease, and stroke, and develop patient handling strategies to prevent back injuries and position the patient to breathe.
- - Understand the different types of technology-assisted/dependent devices, such as ventilation devices, apnea monitoring/pulse oximetry, long-term vascular access devices, dialysis shunts, nutritional support, and colostomy or ileostomy.
- - Understand the basics of hospice care, including comfort care versus curative care, EMS intervention, and DNR (Do Not Resuscitate) orders.
- - Understand the different components of tracheostomy, routine care principles, and acute care considerations.
- - Develop strategies for communicating with patients who have sensory deficits, such as sight or hearing impairment, and recognize the use of service dogs or sign language interpreters.
- - Understand the common reasons for calls from patients over age 65 who receive homecare.
- - Respect the patient and their family or friends, provide explanations, and be prepared to receive additional information from them.

#### ***Unit: EMR CH E29: Transport Operations***

##### Learning Objectives:

- - Understand The nine phases of an ambulance call

- - Understand Causes of Ambulance Crashes
- - Understand Particular types of transport
- - Understand Dealing with an Air Ambulance emergency

#### ***Unit: EMR CH E30 and E31: Multiple Casualty Incidents***

##### Learning Objectives:

- - Understand the concept of Multiple Casualty Incidents (MCI) and their significant demand on resources.
- - Identify the principles and techniques of triage, including primary and secondary triage, documentation, and patient distribution.
- - Recognize the importance of ongoing coordination and communication during an MCI, including consideration of specialty patient needs and hospital surge capacity.
- - Develop an understanding of post-traumatic and cumulative stress and the roles of defusing and debriefing in managing it after an MCI.

#### ***Unit: EMR CH E32: Vehicle Extrication***

##### Learning Objectives:

- - Understand the role of EMS in vehicle extrication, including providing patient care and performing simple extrication while prioritizing personal safety.
- - Develop skills to ensure patient safety during vehicle extrication, such as keeping them informed of actions, protecting from further harm, and controlling traffic flow.
- - Understand situational safety considerations, including controlling traffic flow, properly positioning emergency vehicles, and assessing hazards such as downed electrical lines, leaking fuels or fluids, and broken glass.
- - Develop skills for vehicle stabilization, including putting the vehicle in "park" or in gear, setting the parking brake, and identifying hazardous vehicle safety components.
- - Evaluate the need for additional resources during vehicle extrication, such as extrication equipment, fire suppression, law enforcement, and utility companies
- - Develop skills for extrication using simple hand tools, such as hammers, center punches, pry bars, hack saws, and come-alongs.
- - Understand special considerations for patient care during vehicle extrication, such as maintaining manual cervical spine stabilization, completing primary assessment, providing critical interventions, and assisting with rapid extrication using the path of least resistance and sufficient personnel.

#### **Emergency Medical Technician - MissionCIT**

#### ***Unit: EMT CH 002: The Well-Being of the EMT***

##### Learning Objectives:

- - Disease Transmission: Understand the principles of disease transmission prevention in EMS.
- - Medical Restraint: Understand the use of medical restraint and the principles of the Use of Force Doctrine in EMS.
- - Wellness Principles: Understand the importance of physical and mental wellbeing in EMS, including physical fitness, sleep, disease prevention, and stress management.
- - Patient Positioning: Understand the principles of patient positioning, including different positioning techniques for patients with varying medical conditions.
- - Lifting and Moving Patients: Understand the guidelines for lifting and moving patients, including lifting techniques, safety precautions, and the use of equipment such as stretchers and cots.
- - Prevention of Work-Related Injuries: Understand how to prevent work-related injuries by practicing safe lifting techniques, maintaining physical fitness and nutrition, and following Standard Precautions/OSHA regulations.
- - Stress Management: Understand the different types of stress reactions, and learn stress management techniques such as lifestyle changes and seeking professional assistance.
- - Personal Protective Equipment: Understand the importance of personal protective equipment in preventing occupational hazards.
- - Standard Safety Precautions: Demonstrate adherence to standard safety precautions, including hand washing, environmental control, and safe operation of EMS equipment.
- - Evidence-Based Decision-Making: Understand the importance of using evidence-based decision-making in EMS practice.

***Unit: Anatomy and Physiology - Lesson 01: Musculoskeletal System***

No Learning Objectives available.

***Unit: EMT CH 038: Lifting and Moving Patients***

No Learning Objectives available.

***Unit: EMT CH 039: EMS Transport Operations***

No Learning Objectives available.

***Unit: EMT CH 040: Highway Safety and Vehicle Extrication***

No Learning Objectives available.

***Unit: EMT CH 042: Multi-Casualty and Field Triage***

No Learning Objectives available.

***Unit: EMT CH 043: Hazmat and Terrorism Emergencies***

No Learning Objectives available.

***Unit: EMT CH 044: Narcan | Nalaxone***

No Learning Objectives available.

***Unit: EMT CH 045: Hemorrhage Control***

No Learning Objectives available.

***Unit: EMT CH 048: Infectious Diseases***

No Learning Objectives available.

***Unit: EMT CH 049: Research and Evidence Based Guidelines***

No Learning Objectives available.

***Unit: EMT CH 050: EMS Culture of Safety***

No Learning Objectives available.

***Unit: EMT CH 101: The History of the EMS System***

No Learning Objectives available.

***Unit: EMT CH 102: We don't do that anymore***

No Learning Objectives available.

***Unit: EMT CH 103: PTSD - The Trauma of Trauma***

No Learning Objectives available.

***Unit: EMT CH 104: Sports Injuries***

No Learning Objectives available.

***Unit: EMT CH 105: Illicit drugs and Tool kit for First Responders***

No Learning Objectives available.

***Unit: EMT CH 108: LGBTQIA content***

No Learning Objectives available.

***Unit: EMT CH 010: CPR***

Learning Objectives:

- - Understand Elements of Basic Life Support
- - Understand Airway Management
- - Understand CPR Skills
- - Understand A E D
- - Understand how to manage Foreign Body Airway Obstruction
- - Understand Team Dynamics



***Unit: EMT CH 023: Poisoning and Overdose Emergencies | Toxicology***

No Learning Objectives available.

***Unit: EMT CH 024: Multi-System Trauma***

No Learning Objectives available.

***Unit: EMT CH 025: Hematologic Emergencies***

No Learning Objectives available.

***Unit: EMT CH 035: Chest Injuries***

No Learning Objectives available.

***Unit: EMT CH 026: Behavioral and Psychiatric Emergencies and Suicide***

No Learning Objectives available.

***Unit: EMT CH 027: Obstetric and Gynecologic Emergencies***

No Learning Objectives available.

***Unit: EMT CH 028: Pediatric Emergencies***

No Learning Objectives available.

***Unit: EMT CH 029: Geriatric Emergencies***

No Learning Objectives available.

***Unit: EMT CH 030: Emergencies for Patients with Special Challenges***

No Learning Objectives available.

***Unit: EMT CH 031: Bleeding and Shock***

No Learning Objectives available.

***Unit: EMT CH 032: Trauma to the Head, Neck and Spine***

No Learning Objectives available.

***Unit: EMT CH 033: Soft-Tissue Injuries***

No Learning Objectives available.

***Unit: EMT CH 034: Face and Neck Injuries***

No Learning Objectives available.

## **Open Textbooks**

### **An Interprofessional Virtual Gaming Simulation: Breaking the Chain of Transmission**

***Unit: An Interprofessional Virtual Gaming Simulation: Breaking the Chain of Transmission***

Learning Objectives:

- - Apply interprofessional communication skills to foster collaboration and provide safe client care
- - Demonstrate knowledge and skills related to infection prevention and control practices
- - Identify high risk areas to break the chain of transmission.

## **Anatomy & Physiology**

### ***Unit: Anatomy & Physiology 01: Introduction***

#### **Learning Objectives:**

- - Compare and contrast the study of anatomy and physiology
- - Describe the structure of the body, from simplest to most complex
- - Define homeostasis and explain its importance to normal human functioning
- - Use appropriate anatomical terminology to identify key body structures, body regions, and directions in the body
- - Compare and contrast imaging techniques in terms of their function and use in studying the human body

### ***Unit: Anatomy & Physiology 02: The Chemical Level of Organization***

#### **Learning Objectives:**

- - Describe the fundamental composition of matter
- - Identify the three subatomic particles
- - Identify the four most abundant elements in the body
- - Explain the relationship between an atom's number of electrons and its relative stability
- - Distinguish between ionic bonds, covalent bonds, and hydrogen bonds
- - Explain how energy is invested, stored, and released via chemical reactions, particularly those reactions that are critical to life
- - Explain the importance of the inorganic compounds that contribute to life, such as water, salts, acids, and bases
- - Compare and contrast the four important classes of organic (carbon-based) compounds—proteins, carbohydrates, lipids and nucleic acids—according to their composition and functional importance to human life

### ***Unit: Anatomy & Physiology 03: The Cellular Level of Organization***

#### **Learning Objectives:**

- - Describe the structure and function of the cell membrane, including its regulation of materials into and out of the cell
- - Describe the functions of the various cytoplasmic organelles

- - List the morphological and physiological characteristics of some representative cell types in the human body
- - Explain the structure and contents of the nucleus, as well as the process of DNA replication
- - Explain the process by which a cell builds proteins using the DNA code
- - List the stages of the cell cycle in order, including the steps of cell division in somatic cells
- - Discuss how a cell differentiates and becomes more specialized

#### ***Unit: Anatomy & Physiology 04: The Tissue Level of Organization***

Learning Objectives:

- - Identify the main tissue types and discuss their roles in the human body.
- - Describe the structural characteristics of the various epithelial tissues and how these characteristics enable their functions.
- - Describe the structural characteristics of the various connective tissues and how these characteristics enable their functions.
- - Describe the characteristics of muscle tissue and how these dictate muscle function.
- - Describe the characteristics of nervous tissue and how these enable the unique functions of nervous tissue.
- - Describe the process of tissue response to injury.
- - lalala

#### ***Unit: Anatomy & Physiology 05: The Integumentary System New Learning Object***

Learning Objectives:

- - Describe the integumentary system and the role it plays in homeostasis
- - Describe the layers of the skin and the functions of each layer
- - Describe the accessory structures of the skin and the functions of each
- - Describe the functions of the integumentary system
- - Describe the changes that occur in the integumentary system during the aging process
- - Discuss several common diseases, disorders, and injuries that affect the integumentary system

#### ***Unit: Anatomy & Physiology 06: Bone Tissue and the Skeletal System***

Learning Objectives:

- - List and describe the functions of the skeletal system
- - Describe the classes of bones
- - Describe the microscopic and gross anatomical structures of bones
- - Discuss the process of bone formation and development
- - Explain how bone repairs itself after a fracture

- - Discuss the effect of exercise, nutrition, and hormones on bone tissue
- - Describe how an imbalance of calcium can affect bone tissue

#### ***Unit: Anatomy & Physiology 07: Axial Skeleton***

Learning Objectives:

- - Describe the functions of the skeletal system and define its two major subdivisions
- - Identify the bones and bony structures of the skull, the cranial suture lines, the cranial fossae, and the openings in the skull
- - Discuss the vertebral column and regional variations in its bony components and curvatures
- - Describe the components of the thoracic cage
- - Discuss the embryonic development of the axial skeleton

#### ***Unit: Anatomy & Physiology 08: The Appendicular Skeleton***

Learning Objectives:

- - Describe the bones of the pectoral girdle, and describe how the girdle unites the upper limbs with the axial skeleton
- - Describe the bones of the upper limb, including the bones of the arm, forearm, wrist, and hand
- - Describe the bones of the pelvic girdle, and describe how the pelvis unites the lower limbs with the axial skeleton.
- - Describe the bones of the lower limb, including the bones of the thigh, leg, ankle, and foot
- - Describe the embryonic formation and growth of the limb bones

#### ***Unit: Anatomy & Physiology 09: Joints***

Learning Objectives:

- - Discuss both functional and structural classifications for body joints
- - Describe the characteristic features for fibrous joints and give examples
- - Describe the characteristic features for cartilaginous joints and give examples
- - Describe the characteristic features for synovial joints and give examples
- - Define and identify the different body movements
- - Discuss the structure of specific body joints and the movements allowed by each
- - Explain the development of body joints

#### ***Unit: Anatomy & Physiology 10: Muscle Tissue***

Learning Objectives:

- - Describe structural and functional differences of skeletal, cardiac, and smooth muscle tissue
- - Describe the structure and function of skeletal muscle fibers
- - Explain the process involved with initiating muscle contraction and relaxation
- - Explain how the nervous system is able to regulate force generation in skeletal muscle
- - Describe the types of skeletal muscle fibers
- - Relate the connections between exercise and muscle performance
- - Understand the structure and function of smooth muscle tissue
- - Explain the development and regeneration process of muscle tissue

#### ***Unit: Anatomy & Physiology 11: The Muscular System***

##### Learning Objectives:

- - Describe the actions and roles of agonists and antagonists
- - Explain the structure and organization of muscle fascicles and their role in generating force
- - Explain the criteria used to name skeletal muscles
- - Identify the skeletal muscles and their actions on the skeleton and soft tissues of the body
- - Identify the origins and insertions of skeletal muscles and the prime movements

#### ***Unit: Anatomy & Physiology 12: The Nervous System and Nervous Tissue***

##### Learning Objectives:

- - Relate the anatomical structures to the basic functions of the nervous system.
- - Explain how neurons and glial cells work together to perform and support the nervous system functions.
- - Describe the pathway involved with neural sensation, integration and motor response.
- - Describe signal conduction at chemical synapses.
- - Link how movement of ions across the neuron membrane creates membrane potentials.

#### ***Unit: Anatomy & Physiology 13: The Peripheral Nervous System***

##### Learning Objectives:

- - Describe different types of sensory receptors
- - Describe the structures found in the PNS
- - Name and describe the sensory and motor functions of the cranial and spinal nerves
- - Explain the arrangement of gray and white matter in the spinal cord
- - Describe several reflex arcs and their functional roles
- - Describe the arrangement of sensory and motor regions in the spinal cord

***Unit: Anatomy & Physiology 14: The Central Nervous System***

Learning Objectives:

- - Describe the growth and differentiation of the neural tube
- - Relate the different stages of development to the adult structures of the central nervous system
- - Explain the expansion of the ventricular system of the adult brain from the central canal of the neural tube
- - Describe the connections of the diencephalon and cerebellum on the basis of patterns of embryonic development

***Unit: Anatomy & Physiology 15: The Special Senses***

Learning Objectives:

- - Describe the structures responsible for the special sense of taste.
- - Distinguish how different tastes are transduced.
- - Describe the structures responsible for the special senses of smell
- - Describe the structures responsible for the special senses of hearing.
- - Describe the means of mechanoreception for hearing
- - Describe the structures responsible for the special senses of vision
- - List the supporting structures around the eye and describe the structure of the eyeball.
- - Describe the processes of phototransduction

***Unit: Anatomy & Physiology 16: The Autonomic Nervous System***

Learning Objectives:

- - Describe the components of the autonomic nervous system
- - Differentiate between the structures of the sympathetic and parasympathetic divisions in the autonomic nervous system
- - Name the components of a visceral reflex specific to the autonomic division to which it belongs
- - Predict the response of a target effector to autonomic input on the basis of the released signaling molecule
- - Describe how the central nervous system coordinates and contributes to autonomic functions

***Unit: Anatomy & Physiology 17: The Endocrine System***

Learning Objectives:

- - Identify the contributions of the endocrine system to homeostasis
- - Discuss the chemical composition of hormones and the mechanisms of hormone action

- - Summarize the site of production, regulation, and effects of the hormones of the pituitary, thyroid, parathyroid, adrenal, and pineal glands
- - Discuss the hormonal regulation of the reproductive system
- - Explain the role of the pancreatic endocrine cells in the regulation of blood glucose
- - Identify the hormones released by the heart, kidneys, and other organs with secondary endocrine functions
- - Discuss several common diseases associated with endocrine system dysfunction
- - Discuss the embryonic development of, and the effects of aging on, the endocrine system

### ***Unit: Anatomy & Physiology 18: The Cardiovascular System: Blood***

#### Learning Objectives:

- - Identify the primary functions of blood, its fluid and cellular components, and its characteristics
- - Describe the formation of the formed element components of blood
- - Discuss the structure and function of red blood cells and hemoglobin
- - Classify and characterize white blood cells
- - Describe the process of hemostasis
- - Explain the significance of AB and Rh blood groups in blood transfusions
- - Discuss a variety of blood disorders

### ***Unit: Anatomy & Physiology 19: The Cardiovascular System: The Heart***

#### Learning Objectives:

- - Describe the location of the heart and its internal and external features
- - Describe the path of blood through the cardiac circuits
- - Explain how blood flows through the coronary circulation and why this is necessary for cardiac function
- - Describe the anatomy of cardiac muscle
- - Explain how the cardiac conduction system controls cardiac muscle contraction
- - Describe the process and purpose of an electrocardiogram
- - Summarize and explain the connection between the various events of the cardiac cycle
- - Describe factors that effect cardiac output and be able to calculate it
- - Describe the effects of exercise on cardiac output and heart rate
- - Identify cardiovascular centers and cardiac reflexes that regulate heart function
- - Describe how heart rate, stroke volume, contractility, and the Frank-Starling mechanism affect cardiac output
- - Identify the factors affecting heart rate and stroke volume
- - Describe fetal heart development

***Unit: Anatomy & Physiology 20: The Cardiovascular System: Blood Vessels and Circulation***

## Learning Objectives:

- - Compare and contrast the anatomical structure of arteries, arterioles, capillaries, venules, and veins
- - Accurately describe the forces that account for capillary exchange
- - List the major factors affecting blood flow, blood pressure, and resistance
- - Describe how blood flow, blood pressure, and resistance interrelate
- - Discuss how the neural and endocrine mechanisms maintain homeostasis within the blood vessels
- - Describe the interaction of the cardiovascular system with other body systems
- - Label the major blood vessels of the pulmonary and systemic circulations
- - Identify and describe the hepatic portal system
- - Describe the development of blood vessels and fetal circulation
- - Compare fetal circulation to that of an individual after birth

***Unit: Anatomy & Physiology 21: The Lymphatic and Immune System***

## Learning Objectives:

- - Identify the components and anatomy of the lymphatic system
- - Discuss the role of the innate immune response against pathogens
- - Describe the power of the adaptive immune response to cure disease
- - Explain immunological deficiencies and over-reactions of the immune system
- - Discuss the role of the immune response in transplantation and cancer
- - Describe the interaction of the immune and lymphatic systems with other body systems

***Unit: Anatomy & Physiology 22: The Respiratory System***

## Learning Objectives:

- - List the structures of the respiratory system
- - List the major functions of the respiratory system
- - Outline the forces that allow for air movement into and out of the lungs
- - Outline the process of gas exchange
- - Summarize the process of oxygen and carbon dioxide transport within the respiratory system
- - Create a flow chart illustrating how respiration is controlled
- - Discuss how the respiratory system responds to exercise
- - Describe the development of the respiratory system in the embryo



### ***Unit: Anatomy & Physiology 23: The Digestive System***

#### Learning Objectives:

- - Describe the functional histology of the alimentary canal
- - Describe the processes and control of ingestion, propulsion, mechanical digestion, chemical digestion, absorption, and defecation
- - Describe the functional anatomy and digestive processes of the mouth, pharynx, and esophagus
- - Describe the functional anatomy and digestive processes of the stomach
- - Describe the functional anatomy and digestive processes of the liver, pancreas, and gall bladder
- - Describe the functional anatomy and digestive processes of the small and large intestines
- - Describe digestion and absorption of carbohydrates, proteins, lipids, nucleic acids, minerals, vitamins, and water

### ***Unit: Anatomy & Physiology 24: Metabolism and Nutrition***

#### Learning Objectives:

- - Describe the processes involved in anabolic and catabolic reactions
- - Describe carbohydrate metabolism and its importance for the body
- - Describe lipid metabolism and its importance for the body
- - Describe protein metabolism and its importance for the body
- - Explain the processes that regulate glucose levels during the absorptive and postabsorptive states
- - Explain how metabolism is essential to maintaining body temperature (thermoregulation)
- - Summarize the importance of vitamins and minerals in the diet

### ***Unit: Anatomy & Physiology 25: The Urinary System***

#### Learning Objectives:

- - Describe the macroscopic and microscopic anatomy of the kidney
- - Describe the anatomy of the nephron.
- - Describe the processes involved in urine formation
- - Describe the mechanism and control of glomerular filtration
- - Explain how the kidney reclaims filtered substances (reabsorption).
- - Explain how the kidney removes unfiltered substances from the blood (secretion).
- - Describe how the medullary concentration gradient is formed and maintained.
- - Describe how the kidney can produce a concentrated or dilute urine using hormones.
- - Explain how the kidney alters blood volume and composition.

- - Describe the anatomy of the urinary system and its role in urine storage and transport.
- - Explain the integrative influences of kidney function on the body.

***Unit: Anatomy & Physiology 26: Fluid, Electrolyte, and Acid-Base Balance***

Learning Objectives:

- - Identify the body's main fluid compartments
- - Describe how fluid and solutes move between compartments
- - Define plasma osmolality and identify two ways in which plasma osmolality is maintained
- - Describe how ADH is involved in regulating water output
- - Identify the six ions most important to the function of the body
- - Describe how sodium, potassium, calcium, and phosphate are regulated
- - Define buffer and discuss the role of buffers in the body
- - Explain why bicarbonate must be conserved rather than reabsorbed in the kidney
- - Identify the normal range of blood pH and name the conditions where one has a blood pH that is either too high or too low
- - Describe the body's compensatory mechanisms for acidosis and alkalosis

***Unit: Anatomy & Physiology 27: The Sexual Systems***

Learning Objectives:

- - Describe the structure and general functions of the organs of sexual systems
- - Explain how bipotential tissues are directed to develop into sex organs
- - Name the rudimentary duct systems in the embryo that are precursors to internal sex organs
- - Describe the hormonal changes that bring about puberty, and the secondary sex characteristics
- - Explain the events during spermatogenesis that produce haploid sperm from diploid cells
- - Identify the importance of testosterone in male reproductive function
- - Explain how bipotential tissues are directed to develop into male or female sex organs
- - Name the rudimentary duct systems in the embryo that are precursors to male or female internal sex organs
- - Describe the hormonal changes that bring about puberty, and the secondary sex characteristics of men and women

***Unit: Anatomy & Physiology 28: Development and Inheritance***

Learning Objectives:

- - List and explain the steps involved in fertilization
- - Describe the major events in embryonic development

- - Describe the major events in fetal development
- - Discuss the adaptations of a woman's body to pregnancy
- - Describe the physiologic adjustments that the newborn must make in the first hours of extrauterine life
- - Summarize the physiology of lactation
- - Classify and describe the different patterns of inheritance

### **Comprehensive Midwifery: The role of the midwife in health care practice, education, and research**

#### ***Unit: Comprehensive Midwifery 01: Health Care Context***

##### Learning Objectives:

- - Critically analyze how birth has been represented in different forms of art throughout history, and understand how these representations have shaped cultural attitudes towards childbirth
- - Explain the importance of human rights in midwifery care, and identify strategies for promoting and protecting these rights in practice.
- - Describe the scope of midwifery practice and its role in maternal and child health, including the benefits and limitations of midwifery care.
- - Apply health policy analysis frameworks to evaluate the impact of policy decisions on midwifery care and identify areas for advocacy and reform.
- - Articulate the significance of interdisciplinary collaboration in midwifery and its potential to improve maternal and child health outcomes.

#### ***Unit: Comprehensive Midwifery 02: As Practitioner***

##### Learning Objectives:

- - Demonstrate competence in midwifery practice, including providing care throughout the childbirth continuum and promoting health and wellness for pregnant and postpartum clients.
- - Communicate effectively with clients, colleagues, and other healthcare professionals, using a client-centered approach to support informed decision-making and positive outcomes.
- - Work collaboratively and respectfully with diverse clients and colleagues, recognizing and addressing differences related to culture, gender, sexuality, and other social identities.
- - Navigate the professional framework for midwifery practice in Canada, including regulatory requirements, standards of practice, and ethical considerations.
- - Engage in reflective practice and ongoing professional development, utilizing feedback, self-assessment, and evidence-based approaches to improve the quality of their care and promote positive outcomes for clients.

### ***Unit: Comprehensive Midwifery 03: As Educator***

#### Learning Objectives:

- - Design and implement effective health education and promotion strategies for diverse populations, using evidence-based approaches and principles of health literacy.
- - Evaluate and apply different approaches to midwifery education, including traditional apprenticeship models, academic programs, and continuing education opportunities.
- - Articulate the roles and responsibilities of academic midwives as scholars, educators, and researchers, and identify opportunities for contributing to the advancement of midwifery knowledge and practice.
- - Develop and deliver midwifery education content and programs that are grounded in adult learning theory, culturally responsive, and responsive to the needs and experiences of diverse learners.
- - Critically evaluate midwifery education and training programs, identifying areas for improvement and advocating for the development of rigorous and comprehensive educational standards for the profession.

### ***Unit: Comprehensive Midwifery 04: As Researcher***

#### Learning Objectives:

- - Identify, evaluate, and apply relevant research evidence to support evidence-based practice and evidence-informed midwifery care.
- - Articulate the role of midwives as researchers, including the potential benefits of engaging in research for advancing the profession and improving maternal and child health outcomes.
- - Develop and implement research projects related to midwifery practice, utilizing appropriate research methods and ethical considerations.
- - Critically evaluate research studies in midwifery and related fields, identifying strengths, limitations, and implications for practice and policy.

### **Foundations for Assisting in Home Care**

#### ***Unit: HLTH 07: Foundations for Assisting in Home Care***

#### Learning Objectives:

- - Understand the history, definition, and team structure of home care, as well as the vital role played by Home Health Aides/Personal Care Aides in the home care team and the range of tasks they may perform.
- - Understand the physical and psychological needs of patients, the influence of culture on healthcare practices and values, effective communication skills, documentation of care, identification of different types of abuse and ways to protect patient rights, including confidentiality and privacy.

- - Understand the special needs and challenges faced by elderly patients, including the physical and psychological changes that come with aging
- - Provide appropriate care that meets their unique needs while taking into consideration societal attitudes towards aging.
- - Understand the physical and psychological development of children from infancy to adolescence and how this impacts their home care needs.
- - Help children and teenagers manage stress and develop positive coping skills.
- - Understand the concepts of mental health and mental illness, with a focus on specific mental health issues such as anxiety, depression, and schizophrenia.
- - Understand what developmental disabilities are, including causes and how they affect a person's functioning.
- - Work with patients who have developmental disabilities to help them achieve independence to the fullest extent possible.
- - Understand the concept of physical disabilities, including their causes and how they differ from developmental disabilities.
- - Understand the basics of nutrition, including the role of major nutrients such as carbohydrates, protein, and fats in physical well-being.
- - Plan nutritious meals using the USDA's ChooseMyPlate guidelines, as well as different dietary needs such as low salt, low fat, vegetarian, gluten-free, and mechanical diets for individuals with swallowing difficulties.
- - Understand how Home Health Aides/Personal Care Aides can assist patients in managing their finances and developing a budget.
- - Help patients track expenses and plan a budget based on income and household expenditures.
- - Understand the importance of housekeeping and how to perform it effectively as a Home Health Aide/Personal Care Aide.
- - Use proper body mechanics to prevent injury, develop task lists, and prioritize tasks.
- - Perform specific housekeeping tasks in each room of the home, including the kitchen, bathroom, bedroom, and living room.
- - Understand the types of injuries that can occur in the home, such as falls, burns, cuts, poisoning, choking, and fires, and how to prevent them as a Home Health Aide/Personal Care Aide.
- - Deal with serious medical emergencies, including heart attacks, seizures, and strokes.
- - Provide personal care to home care patients, including infection control, bathing, teeth and mouth care, dressing and grooming, assisting with eating, toileting, transferring, self-administration of medication, and infant care.

## Introduction to Health Assessment for the Nursing Professional

### *Unit: 00: INTRODUCTION TO HEALTH ASSESSMENT FOR THE NURSING PROFESSIONAL:*

#### *Introduction*

Learning Objectives:

- - Completion

### *Unit: 01: INTRODUCTION TO HEALTH ASSESSMENT FOR THE NURSING PROFESSIONAL: Chapter 1 - Introduction to Health Assessment*

Learning Objectives:

- - Understand the role of health assessment.
- - Apply the cognitive steps of clinical judgment.
- - Understand approaches to health assessment.
- - Recognize the role health promotion plays in health assessment.

### *Unit: 02: INTRODUCTION TO HEALTH ASSESSMENT FOR THE NURSING PROFESSIONAL: Inclusive Approaches to Health Assessment*

Learning Objectives:

- - Describe the concept of inclusive health assessment.
- - Define key principles of inclusive health assessment.
- - Outline an anti-oppressive approach to inclusive health assessment.

### *Unit: 03: INTRODUCTION TO HEALTH ASSESSMENT FOR THE NURSING PROFESSIONAL: Respiratory System*

Learning Objectives:

- - Apply subjective assessment skills.
- - Apply objective assessment skills.
- - Use clinical judgment.
- - Integrate health promotion interventions into actions.
- - Integrate an inclusive approach to respiratory assessment.

### *Unit: 04: INTRODUCTION TO HEALTH ASSESSMENT FOR THE NURSING PROFESSIONAL: Cardiovascular System*

Learning Objectives:

- - Apply subjective assessment skills.
- - Apply objective assessment skills.
- - Use clinical judgment.
- - Integrate health promotion interventions into actions.

- - Integrate an inclusive approach to cardiovascular assessment.

***Unit: 05: INTRODUCTION TO HEALTH ASSESSMENT FOR THE NURSING PROFESSIONAL:***

***Gastrointestinal System***

Learning Objectives:

- - Apply subjective assessment skills.
- - Apply objective assessment skills.
- - Use clinical judgment.
- - Integrate health promotion interventions into actions.

**Medical Terminology**

***Unit: HLTH 05: 01: MEDICAL TERMINOLOGY***

Learning Objectives:

- - Use the anatomic reference system to identify the anatomic position of the body
- - Use the anatomic reference system to identify the body planes
- - Use the anatomic reference system to identify the body cavities
- - Use the anatomic reference system to identify the directional terms
- - Use the anatomic reference system to identify the divisions of the body
- - Describe the structural organization of the body
- - Apply the rules of medical language
- - Identify meanings of key word components
- - Apply the rules of medical language to build, analyze, spell, pronounce, abbreviate, and define terms as they relate to the integumentary system
- - Identify meanings of key word components of the integumentary system
- - Categorize diagnostic, therapeutic, procedural or anatomic terms related to the integumentary system
- - Use terms related to the integumentary system
- - Use terms related to the diseases and disorders of the integumentary system
- - Apply the rules of medical language to build, analyze, spell, pronounce, abbreviate, and define terms as they relate to the respiratory system
- - Identify meanings of key word components of the respiratory system
- - Categorize diagnostic, therapeutic, procedural or anatomic terms related to the respiratory system
- - Use terms related to the respiratory system
- - Use terms related to the diseases and disorders of the respiratory system
- - Apply the rules of medical language to build, analyze, spell, pronounce, abbreviate, and define terms as they relate to the urinary system
- - Identify meanings of key word components of the urinary system

- - Categorize diagnostic, therapeutic, procedural or anatomic terms related to the urinary system
- - Use terms related to the urinary system
- - Use terms related to the diseases and disorders of the urinary system
- - Apply the rules of medical language to build, analyze, spell, pronounce, abbreviate, and define terms as they relate to the male reproductive system
- - Identify meanings of key word components of the male reproductive system
- - Categorize diagnostic, therapeutic, procedural or anatomic terms related to the male reproductive system
- - Use terms related to the male reproductive system
- - Use terms related to the diseases and disorders of the male reproductive system
- - Apply the rules of medical language to build, analyze, spell, pronounce, abbreviate, and define terms as they relate to the female reproductive system
- - Identify meanings of key word components of the female reproductive system
- - Categorize diagnostic, therapeutic, procedural or anatomic terms related to the female reproductive system
- - Use terms related to the female reproductive system
- - Use terms related to the diseases and disorders of the female reproductive system
- - Identify the common processes in obstetrics
- - Describe the specialty of obstetrics
- - Spell the medical terms used in obstetrics and use correct abbreviations
- - Identify the medical specialties associated with obstetrics
- - Explore common complications and procedures related to obstetrics
- - Apply the rules of medical language to build, analyze, spell, pronounce, abbreviate, and define terms as they relate to the cardiovascular system
- - Identify meanings of key word components of the cardiovascular system
- - Categorize diagnostic, therapeutic, procedural or anatomic terms related to the cardiovascular system
- - Use terms related to the cardiovascular system
- - Use terms related to the diseases and disorders of the cardiovascular system
- - Apply the rules of medical language to build, analyze, spell, pronounce, abbreviate, and define terms as they relate to the blood
- - Identify meanings of key word components of the blood
- - Spell medical terms of the blood vessels and blood and use correct abbreviations
- - Categorize diagnostic, therapeutic, procedural or anatomic terms related to the blood
- - Use terms related to the blood
- - Use terms related to the diseases and disorders of the blood
- - Apply the rules of medical language to build, analyze, spell, pronounce, abbreviate, and define terms as they relate to the lymph and immune systems



- - Identify meanings of key word components of the lymph and immune systems
- - Categorize diagnostic, therapeutic, procedural or anatomic terms related to the lymph and immune systems
- - Use terms related to the lymph and immune systems
- - Use terms related to the diseases and disorders of the lymph and immune systems
- - Apply the rules of medical language to build, analyze, spell, pronounce, abbreviate, and define terms as they relate to the digestive system
- - Identify meanings of key word components of the digestive system
- - Categorize diagnostic, therapeutic, procedural or anatomic terms related to the digestive system
- - Use terms related to the digestive system
- - Use terms related to the diseases and disorders of the digestive system
- - Apply the rules of medical language to build, analyze, spell, pronounce, abbreviate, and define terms as they relate to the musculoskeletal system
- - Identify meanings of key word components of the musculoskeletal system
- - Categorize diagnostic, therapeutic, procedural or anatomic terms related to the musculoskeletal system
- - Use terms related to the musculoskeletal system
- - Use terms related to the diseases and disorders of the musculoskeletal system
- - Identify the anatomy of the muscular system
- - Describe the main functions of the muscular system
- - Spell the medical terms of the muscular system and use correct abbreviations
- - Explore common diseases, disorders, and procedures related to the muscular system
- - Identify the medical specialties associated with the muscular system
- - Apply the rules of medical language to build, analyze, spell, pronounce, abbreviate, and define terms as they relate to the sensory system
- - Identify meanings of key word components of the sensory system
- - Categorize diagnostic, therapeutic, procedural or anatomic terms related to the sensory system
- - Use terms related to the sensory system
- - Use terms related to the diseases and disorders of the sensory system
- - Apply the rules of medical language to build, analyze, spell, pronounce, abbreviate, and define terms as they relate to the nervous system
- - Identify meanings of key word components of the nervous system
- - Categorize diagnostic, therapeutic, procedural or anatomic terms related to the nervous system
- - Use terms related to the nervous system
- - Use terms related to the diseases and disorders of the nervous system

- - Apply the rules of medical language to build, analyze, spell, pronounce, abbreviate, and define terms as they relate to the endocrine system
- - Identify meanings of key word components of the endocrine system
- - Categorize diagnostic, therapeutic, procedural or anatomic terms related to the endocrine system
- - Use terms related to the endocrine system
- - Use terms related to the diseases and disorders of the endocrine system
- - Use terms related to the diseases and disorders of the endocrine system

## Nursing Care at The End of Life

### *Unit: Nursing Care at The End of Life: Anticipation*

#### Learning Objectives:

- - Describe how death and dying has changed in this country over the past few centuries.
- - Identify the current top ten causes of death in the United States.
- - Explain what end-of-life care is and what it encompasses.
- - Identify the role of the nurse in end-of-life care.
- - Define illness trajectory.
- - Identify the four most common illness trajectories.
- - Describe the relationship of illness trajectories to hospice care.
- - Explain the importance understanding patterns of illness for individual patients.
- - Define what a theory is and explain its relationship to patients with serious illnesses.
- - Explain how nurses and clinicians can use theories for their care of patients.
- - Describe the premise of quality of life and uncertainty in illness.
- - Identify the five stages of grief.
- - Describe what death awareness is and its relationship to end-of-life care.
- - Define palliative care and hospice care.
- - Compare the similarities and differences between hospice and palliative care.
- - Identify the advantages and disadvantages between hospice and palliative care.
- - Define goals of care in the context of advanced illness.
- - Identify various measures used by clinicians for prognostication.
- - Describe how clinicians use the benefits and burdens of treatment to assist patients in determination of their goals of care.
- - Identify strategies associated with the initiation of end of life conversations.
- - Explain various factors associated with patients preferences for care.

### *Unit: Nursing Care at The End of Life: In the Moment*

#### Learning Objectives:

- - Identify various types of pain and the pharmacological and non-pharmacological interventions used for management.
- - Describe components of a comprehensive pain assessment.
- - Explain barriers associated with effective pain management.
- - Identify the most common non-pain symptoms associated with patients nearing the end of life.
- - Describe the interventions used to relieve refractory dyspnea and terminal restlessness in patients nearing the end of life.
- - Explore the meaning of hope in the context of death and dying.
- - Describe loss and emotional suffering in the patient who is dying.
- - Identify common causes of, and interventions for, spiritual distress in patients nearing the end of life.
- - Define ethics and the role of ethics in medical decision making.
- - Identify basic ethical principles and concepts.
- - Examine difficult decisions in end-of-life care.
- - To understand the role of the nurse during the dying process and death.
- - Describe the phases and associated signs/symptoms involved in the dying process.
- - Explain various nursing interventions to facilitate a good death.
- - Identify several ways nurses can engage in more effective communication with patients and families.
- - Describe some basic communication skills nurses can use to enhance communication.
- - Identify several follow-up responses to use with patients.

#### *Unit: Nursing Care at The End of Life: Afterwards*

##### Learning Objectives:

- - Identify the main factors associated with grief and bereavement in the patient, family, and the nurse.
- - Describe the various types of grief and their associated manifestations.
- - Examine the types of support that can assist individuals to live with their loss.
- - Identify the role of the nurse in providing culturally competent care to patients nearing the end of life.
- - Examine the basic components of funeral traditions in the United States.
- - Describe beliefs and traditions associated with death and dying among various religions and cultures.
- - Evaluate one's own attitudes and beliefs about death and dying.
- - Describe the writer's perspectives about the realm of nursing care at the end of life using lessons learned from clinical experiences.

#### *Unit: Nursing Care and End of Life: : Introduction*

##### Learning Objectives:

- - Completion

## Nursing Fundamentals

### *Unit: Nursing Fundamentals Ch 01: Scope of Practice*

#### Learning Objectives:

- - Discuss nursing scope of practice and standards of care.
- - Compare various settings in which nurses work.
- - Describe contributions of interprofessional health care team members.
- - Describe levels of nursing education and the NCLEX.
- - Discuss basic legal considerations and ethics.
- - Outline professional nursing organizations.
- - Examine quality and evidence-based practice in nursing.

### *Unit: Nursing Fundamentals Ch 02: Communication*

#### Learning Objectives:

- - Assess one's own communication skills and effectiveness.
- - Demonstrate cultural humility, professionalism, and respect when communicating.
- - Use communication styles and methods that demonstrate caring, respect, active listening, authenticity, and trust.
- - Maintain communication with interprofessional team members and others to facilitate safe transitions and continuity in care delivery.
- - Use therapeutic communication techniques.
- - Confirm the recipient of the communication heard and understands the message.
- - Apply principles of distance and space.
- - Discuss strategies for maintaining confidentiality.
- - Use technology to access current and reliable information.
- - Use correct medical terminology and abbreviations.
- - Report significant patient information verbally and in writing.
- - Document according to legal guidelines.

### *Unit: Nursing Fundamentals Ch 03: Diverse Patients*

#### Learning Objectives:

- - Reflect upon personal and cultural values, beliefs, biases, and heritage.
- - Embrace diversity, equity, inclusivity, health promotion, and health care for individuals of diverse geographic, cultural, ethnic, racial, gender, and spiritual backgrounds across the life span.
- - Demonstrate respect, equity, and empathy in actions and interactions with all health care consumers.

- - Participate in life-long learning to understand cultural preferences, worldviews, choices, and decision-making processes of diverse patients.
- - Protect patient dignity.
- - Demonstrate principles of patient-centered care and cultural humility.
- - Make adaptations to patient care to reduce health disparities.
- - Adhere to the Patient's Bill of Rights.
- - Identify strategies to advocate for patients.
- - Use evidence-based practices.

#### *Unit: Nursing Fundamentals Ch 04: Nursing Process*

Learning Objectives:

- - Use the nursing process to provide patient care
- - Identify nursing diagnoses from evidence-based sources
- - Describe the development of a care plan
- - Prioritize patient care
- - Describe documentation for each step of the nursing process
- - Differentiate between the role of the PN and RN

#### *Unit: Nursing Fundamentals 05: Safety*

Learning Objectives:

- - Indicate correct identification of patient prior to performing any patient care measures
- - Identify safety considerations for adults of all ages
- - Include industry standards and regulations regarding microbiological, physical, and environmental safety
- - Apply decision-making related to measures to minimize use of restraints
- - Identify evidence-based practices

#### *Unit: Nursing Fundamentals 06: Cognitive Impairments*

Learning Objectives:

- - Identify factors related to cognitive impairments across the life span
- - Demonstrate respect for the dignity of the patient with a cognitive impairment
- - Collect data to identify patients experiencing alterations in cognition
- - Include adaptations to the environment to maintain safety for the patient with impaired cognition
- - Incorporate nursing strategies to maximize cognitive functioning
- - Outline nursing interventions for specific cognitive disorders
- - Outline resources for patients with a cognitive impairment and their family members or caregivers

- - Identify evidence-based practices in the care of cognitively impaired patients

#### *Unit: Nursing Fundamentals Ch 07: Sensory Impairments*

##### Learning Objectives:

- - Collect data to identify patients experiencing alterations in sensory perception
- - Identify factors related to sensory impairments across the life span
- - Demonstrate respect for the dignity of the patient with a sensory impairment
- - Detail support for family/significant others caring for patients with a sensory impairment
- - Include community resources available for patients and families with a sensory impairment
- - Include adaptations to the environment to maintain safety for the patient with a sensory impairment
- - Incorporate nursing strategies to maximize sensory perception
- - Outline nursing interventions for specific sensory disorders
- - Identify evidence-based practices

#### *Unit: Nursing Fundamentals Ch 08: Oxygenation*

##### Learning Objectives:

- - Assess the patient for objective and subjective manifestations of impaired oxygenation
- - Distinguish normal and abnormal assessment data
- - Adapt care based on oxygenation assessment data
- - Interpret diagnostic tests and lab values indicative of a disturbance in oxygenation
- - Identify evidence-based practices

#### *Unit: Nursing Fundamentals Ch 09: Infection*

##### Learning Objectives:

- - Outline the factors that put patients at risk for infection
- - Identify factors related to infection across the life span
- - Outline personal practices that reduce the risk of infection transmission
- - Base your care decision on the signs and symptoms of infection
- - Base your response on an interpretation of the diagnostic tests related to patient's infectious process
- - Detail the nursing interventions to support or minimize the physical and psychological effects of the infectious process
- - Demonstrate the ability to correlate nursing interventions to methods used to prevent or disrupt the chain of infection
- - Follow industry standards for transmission-based precautions
- - Identify evidence-based practices

***Unit: Nursing Fundamentals Ch 10: Integumentary***

## Learning Objectives:

- - Identify the patients at risk for impaired skin integrity
- - Identify factors related to alterations in the integumentary system across the life span
- - Assess a patient's skin integrity
- - Note normal from abnormal findings
- - Assess the characteristics of the wound
- - Apply correct terminology in the description of wounds
- - Adapt care based on integumentary assessment data gathered
- - Identify evidence-based practices

***Unit: Nursing Fundamentals Ch 11: Comfort***

## Learning Objectives:

- - Assess patients for subjective and objective manifestations of alterations in comfort
- - Identify factors related to comfort across the life span
- - Adhere to standards of care for the patient experiencing pain
- - Identify nonpharmacologic measures to minimize pain and discomfort
- - Outline the plan for monitoring the patient response to the interventions for pain and discomfort
- - Identify evidence-based practices related to assessing pain and providing comfort

***Unit: Nursing Fundamentals Ch 12: Sleep and Rest***

## Learning Objectives:

- - Assess factors that put patients at risk for problems with sleep
- - Identify factors related to sleep/rest across the life span
- - Recognize characteristics of sleep deprivation
- - Consider the use of nonpharmacological measures to promote sleep and rest
- - Identify evidence-based practices

***Unit: Nursing Fundamentals Ch 13: Mobility***

## Learning Objectives:

- - Assess factors that put patients at risk for problems with mobility
- - Identify factors related to mobility across the life span
- - Assess the effects of immobility on body systems
- - Detail the nursing measures to prevent complications of immobility
- - Promote the use of effective techniques of body mechanics among caregivers, patients, and significant others
- - Identify evidence-based practices

***Unit: Nursing Fundamentals Ch 14: Nutrition***

Learning Objectives:

- - Describe variables that influence nutrition
- - Identify factors related to nutrition across the life span
- - Assess a patient's nutritional status
- - Outline specific nursing interventions to promote nutrition
- - Base your decisions on the action of nutrients, signs of excess and deficiency, and specific foods associated with each nutrient
- - Base your decisions on the interpretation of diagnostic tests and lab values indicative of a disturbance in nutrition
- - Give examples of appropriate vitamin use across the life span
- - Identify evidence-based practices related to nutrition

***Unit: Nursing Fundamentals 15: Fluids and Electrolytes***

Learning Objectives:

- - Describe variables that influence fluid and electrolyte balance
- - Identify factors related to fluid/electrolyte balance across the life span
- - Assess a patient's nutritional and fluid/electrolyte status
- - Outline specific nursing interventions to promote fluid and electrolyte balance
- - Base decisions on the signs and symptoms of fluid volume excess and fluid volume deficit
- - Base decisions on the interpretation of diagnostic tests and lab values indicative of a disturbance in fluid and electrolyte balance
- - Identify evidence-based practices

***Unit: Nursing Fundamentals Ch 16: Elimination***

Learning Objectives:

- - Assess factors that put a patient at risk for alterations in urinary and bowel elimination
- - Identify factors related to alterations in elimination across the life span
- - Outline the data that must be collected for identification of alterations in bowel/urine elimination
- - Base decisions on the interpretation of basic diagnostic tests of urinary and bowel elimination: urinalysis and occult blood
- - Detail the nonpharmacologic measures to promote urinary and bowel elimination
- - Identify evidence-based practices

***Unit: Nursing Fundamentals Ch 17: Grief and Loss***

Learning Objectives:



- - Advocate for the ethical/legal concerns of the patient and family members making end-of-life decisions
- - Identify evidence-based practices associated with end of life care
- - Employ nursing measures to support palliative care during the dying process
- - Demonstrate respect for the cultural and spiritual beliefs of the patient, caregiver(s), and family members experiencing grief and loss
- - Outline available personal and community resources
- - Describe nursing responsibilities associated with postmortem care

#### *Unit: Nursing Fundamentals Ch 18: Spirituality*

Learning Objectives:

- - Demonstrate principles of holistic care by incorporating cultural, religious, and spiritual influences on patient health
- - Explain the interconnection between spirituality and religious concepts as they relate to health and spiritually sensitive nursing care
- - Describe methods to assess the spiritual and religious preferences, strengths, concerns, or distress of clients and plan appropriate nursing care

#### *Unit: Nursing Fundamentals Ch 19: Care of the Older Adult*

Learning Objectives:

- - Consider all aspects of diversity, including age
- - Differentiate between normal and abnormal findings for older adults
- - Detail specific adaptations in patient care to accommodate the needs of older adults

#### *Unit: Nursing Fundamentals Ch. 20: Answer Key*

Learning Objectives:

- - Completion

### **Nursing Pharmacology**

#### *Unit: Nursing Pharmacology 01: Principles of Pharmacology*

Learning Objectives:

- - Identify and describe the processes of pharmacokinetics
- - Apply principles of evidence-based practice to identify pertinent information related to drugs
- - Consider pharmacodynamic differences across the lifespan
- - Differentiate among prescription drugs, over-the-counter drugs, herbals, and dietary supplements

***Unit: Nursing Pharmacology 02: Safety and Ethics***

## Learning Objectives:

- - Identify drug administration guidelines for registered nurses in Canada
- - Identify nursing responsibilities to prevent and respond to medication errors
- - Identify ethical responsibilities as they relate to medication errors
- - Explain client-centered care and cultural safety during medication administration
- - Outline nursing actions within the scope of nursing practice as they relate to the administration of medication
- - Identify nursing responsibilities associated with safe client medication administration and education

***Unit: Nursing Pharmacology 03: Antimicrobials***

## Learning Objectives:

- - Identify the classifications and actions of antimicrobial medications
- - Provide examples of when, how, and to whom antimicrobial drugs may be administered
- - Identify the side effects and special considerations associated with antimicrobial therapy
- - Explain considerations and implications of using antimicrobial medications across the lifespan
- - Consider evidence-based concepts when using the nursing process, clinical reasoning and decision-making

***Unit: Nursing Pharmacology 04: Autonomic Nervous System Regulation***

## Learning Objectives:

- - Identify the classifications and actions of autonomic nervous system drugs
- - Give examples of when, how, and to whom autonomic nervous system drugs may be administered
- - Identify the side effects and special considerations associated with autonomic nervous system drugs
- - Include considerations and implications of using autonomic nervous system drugs across the lifespan
- - Include evidence-based concepts when using the nursing process and clinical reasoning related to medications that affect the autonomic nervous system

***Unit: Nursing Pharmacology 05: Gas Exchange***

## Learning Objectives:

- - Identify the classifications and actions of respiratory system drugs

- - Provide examples of when, how, and to whom respiratory system drugs may be administered
- - Identify the side effects and special considerations associated with respiratory system drugs
- - Include considerations and implications of using respiratory system drugs across the lifespan
- - Include evidence-based concepts when using the nursing process and clinical reasoning related to medications that affect the respiratory system

***Unit: Nursing Pharmacology 06: Perfusion and Renal Elimination***

Learning Objectives:

- - Cite the classifications and actions of cardiovascular drugs
- - Cite the classifications and actions of renal system drugs
- - Give examples of when, how, and to whom cardiovascular system drugs may be administered
- - Identify the side effects and special considerations associated with cardiovascular drug therapy
- - Identify considerations and implications of using cardiovascular system medications across the life span
- - Identify considerations and implications of using renal system medications across the life span
- - Apply evidence-based concepts when using the nursing process

***Unit: Nursing Pharmacology 07: Gastrointestinal Elimination***

Learning Objectives:

- - Identify the classifications and actions of the gastrointestinal system and elimination drugs
- - Consider examples of when, how, and to whom gastrointestinal system drugs may be administered
- - Identify the side effects and special considerations associated with gastrointestinal system drug therapy
- - Identify considerations and implications of using gastrointestinal system medications across the lifespan
- - Consider evidence-based concepts when using the nursing process, clinical reasoning, and decision-making related to medications that affect the gastrointestinal system

***Unit: Nursing Pharmacology 08: Central Nervous System Regulation, Mood, and Cognition***

Learning Objectives:

- - Identify the classifications and actions of drugs related to the central nervous system (CNS), mood, and cognition
- - Consider examples of when, how, and to whom CNS, mood and cognition drugs may be administered
- - Identify the side effects and special considerations associated with CNS, mood, and cognitive therapy
- - Identify considerations and implications of using CNS, mood, and cognitive medications across the lifespan
- - Consider evidence-based concepts when using the nursing process, clinical reasoning, and decision-making related to medications that affect the CNS, mood, and cognition.

#### ***Unit: Nursing Pharmacology 09: Endocrine***

Learning Objectives:

- - Explain the importance of personal hygiene and grooming to mental and physical health
- - Define the fundamental elements of personal hygiene and grooming

#### ***Unit: Nursing Pharmacology 10: Pain and Mobility***

Learning Objectives:

- - Identify the classifications and actions of medications related to pain and mobility
- - Consider examples of when, how, and to whom pain and mobility medications may be administered
- - Identify the side effects and special considerations associated with pain and mobility medication therapy
- - Identify considerations and implications of using pain and mobility-related medications across the lifespan
- - Consider evidence-based concepts when using the nursing process, clinical reasoning, and decision-making related to medications for pain and mobility
- - Consider the impact of opioid analgesics on the overdose crisis and the responsibility of the nurse for client education, naloxone administration, and pain management advocacy

### **Nursing Skills**

#### ***Unit: Nursing Skills: 00: Introduction***

Learning Objectives:

- - Completion

***Unit: Nursing Skills: 01: Chapter 1 General Survey***

## Learning Objectives:

- - Perform a general survey assessment, including vital signs, ability to communicate, appropriateness of behaviors and responses, general mobility, and basic nutritional and fluid status.
- - Modify assessment techniques to reflect variations across the life span, cultural values and beliefs, and gender expression.
- - Document actions and observations.
- - Recognize and report significant deviations from norms.

***Unit: Nursing Skills: 02: Chapter 2 Health History***

## Learning Objectives:

- - Establish a therapeutic nurse-patient relationship.
- - Use effective verbal and nonverbal communication techniques.
- - Collect health history data.
- - Modify assessment techniques to reflect variations across the life span and cultural variations.
- - Document actions and observations.
- - Recognize and report significant deviations from norms.

***Unit: Nursing Skills: 03: Chapter 3 Blood Pressure***

## Learning Objectives:

- - Accurately measure and document blood pressure using American Heart Association standards.
- - Adapt the procedure to reflect variations across the life span.
- - Recognize and report significant deviations from blood pressure norms.

***Unit: Nursing Skills: 04: Chapter 4 Aseptic Technique***

## Learning Objectives:

- - Perform appropriate hand hygiene.
- - Use standard precautions.
- - Use category-specific, transmission-based precautions.
- - Maintain a sterile field and equipment.
- - Apply and safely remove sterile gloves and personal protective equipment.
- - Dispose of contaminated wastes appropriately.

***Unit: Nursing Skills: 05: Chapter 5 Math Calculations***

## Learning Objectives:

- - Accurately perform calculations using decimals, fractions, percentages, ratios, and/or proportions.
- - Convert between the metric and household systems.
- - Use military time.
- - Use dimensional analysis.
- - Accurately solve calculations related to conversions, dosages, liquid concentrations, reconstituted medications, weight-based medications, and intravenous infusions and evaluate final answer to ensure safe medication administration.

#### ***Unit: Nursing Skills: 06: Chapter 6 Neurological Assessment***

Learning Objectives:

- - Perform a neurological assessment, including mental status, cranial nerves, sensory function, motor strength, cerebellar function, and reflexes.
- - Modify assessment techniques to reflect variations across the life span.
- - Document actions and observations.
- - Recognize and report significant deviations from norms.

#### ***Unit: Nursing Skills: 07: Chapter 7 Head and Neck Assessment***

Learning Objectives:

- - Perform a head and neck assessment, including the skull, face, nose, oral cavity, and neck.
- - Modify assessment techniques to reflect variations across the life span.
- - Recognize and report significant deviations from norms.
- - Document actions and observations.

#### ***Unit: Nursing Skills: 08: Chapter 8 Eye and Ear Assessment***

Learning Objectives:

- - Perform an eye and ear assessment, including visual acuity, extraocular motion, and hearing acuity.
- - Modify assessment techniques to reflect variations across the life span.
- - Document actions and observations.
- - Recognize and report significant deviations from norms.

#### ***Unit: Nursing Skills: 09: Chapter 9 Cardiovascular Assessment***

Learning Objectives:

- - Perform a cardiovascular assessment, including heart sounds; apical and peripheral pulses for rate, rhythm, and amplitude; and skin perfusion (color, temperature, sensation, and capillary refill time).

- - Identify S1 and S2 heart sounds.
- - Differentiate between normal and abnormal heart sounds.
- - Modify assessment techniques to reflect variations across the life span.
- - Document actions and observations.
- - Recognize and report significant deviations from norms.

***Unit: Nursing Skills: 10: Chapter 10 Respiratory Assessment***

Learning Objectives:

- - Perform a respiratory assessment.
- - Differentiate between normal and abnormal lung sounds.
- - Modify assessment techniques to reflect variations across the life span.
- - Document actions and observations.
- - Recognize and report deviations from norms.

***Unit: Nursing Skills: 11: Chapter 11 Oxygen Therapy***

Learning Objectives:

- - Implement interventions to improve a patient's oxygenation status.
- - Correctly apply oxygen equipment.
- - Set flow rate using fixed and portable equipment.
- - Survey the environment for potential safety hazards.
- - Use pulse oximetry.
- - Assess patient response to oxygen therapy.
- - Adapt procedures to reflect variations across the life span.
- - Document actions and observations.
- - Recognize and report significant deviations from norms.

***Unit: Nursing Skills: 12: Chapter 12 Abdominal Assessment***

Learning Objectives:

- - Perform an abdominal assessment.
- - Differentiate normal and abnormal bowel sounds.
- - Modify assessment techniques to reflect variations across the life span.
- - Document actions and observations.
- - Recognize and report significant deviations from norms.

***Unit: Nursing Skills: 13: Chapter 13 Musculoskeletal Assessment***

Learning Objectives:

- - Perform a musculoskeletal assessment.
- - Palpate joints for pain, swelling, change in temperature, and range of motion.

- - Modify assessment techniques to reflect variations across the life span.
- - Recognize and report significant deviations from norms.
- - Document actions and observations.

***Unit: Nursing Skills: 14: Chapter 14 Integumentary Assessment***

Learning Objectives:

- - Perform an integumentary assessment including the skin, hair, and nails.
- - Modify assessment techniques to reflect variations across the life span and ethnic and cultural variations.
- - Document actions and observations.
- - Recognize and report significant deviations from norms.

***Unit: Nursing Skills: 15: Chapter 15 Administration of Enteral Medications***

Learning Objectives:

- - Safely administer medication orally, rectally, and via enteral tubes.
- - Accurately check medication administration rights three times.
- - Calculate correct amount of medication to administer.
- - Explain medication information to patient.
- - Collect appropriate assessment data prior to and after medication administration.
- - Modify procedure to reflect variations across the life span.
- - Document actions and observations.

***Unit: Nursing Skills: 16: Chapter 16 Administration of Medications Via Other Routes***

Learning Objectives:

- - Safely administer medications and irrigations for the eye, ear, inhalation, and vaginal routes.
- - Select the appropriate equipment.
- - Calculate correct amount to administer.
- - Select appropriate site.
- - Modify the procedure to reflect variations across the life span.
- - Document actions and observations.
- - Recognize and report significant deviations from norms.

***Unit: Nursing Skills: 17: Chapter 17 Enteral Tube Management***

Learning Objectives:

- - Administer enteral nutrition.
- - Perform irrigation and suctioning of enteral tubes.
- - Select appropriate equipment.



- - Explain the procedure to the patient.
- - Assess tube placement.
- - Implement measures to prevent displacement of tube.
- - Modify procedures to reflect variations across the life span.
- - Document actions and observations.
- - Recognize and report significant deviations from norms.

***Unit: Nursing Skills: 18: Chapter 18 Administration of Parenteral Medications***

Learning Objectives:

- - Safely administer medication via the intradermal, subcutaneous, and intramuscular routes.
- - Maintain aseptic technique.
- - Select appropriate equipment.
- - Calculate correct amount of medication to administer.
- - Correctly select site using anatomical landmarks.
- - Modify procedure to reflect variations across the life span.
- - Document actions and observations.
- - Recognize and report significant deviations from norms.

***Unit: Nursing Skills: 19: Chapter 19 Specimen Collection***

Learning Objectives:

- - Accurately collect specimens for blood glucose monitoring, nasal swabs, and oropharyngeal swabs.
- - Modify procedure to reflect variations across the life span.
- - Maintain standard and transmission-based precautions.
- - Select appropriate equipment.
- - Explain procedure to patient.
- - Document actions and observations.
- - Recognize and report significant deviations from norms.

***Unit: Nursing Skills: 20: Chapter 20 Wound Care***

Learning Objectives:

- - Assess tissue condition, wounds, drainage, and pressure injuries.
- - Cleanse and irrigate wounds.
- - Apply a variety of wound dressings.
- - Obtain a wound culture specimen.
- - Use appropriate aseptic or sterile technique.
- - Explain procedure to patient.

- - Adapt procedures to reflect variations across the life span.
- - Recognize and report significant deviations in wounds.
- - Document actions and observations.

***Unit: Nursing Skills: 21: Chapter 21 Facilitation of Elimination***

Learning Objectives:

- - Perform urinary catheterization, ostomy care, and urine specimen collection.
- - Manage urinary catheters to prevent complications.
- - Maintain aseptic or sterile technique.
- - Explain procedure to patient.
- - Modify assessment techniques to reflect variations across the life span.
- - Document actions and observations.
- - Recognize and report significant deviations from norms.

***Unit: Nursing Skills: 22: Chapter 22 Tracheostomy Care & Suctioning***

Learning Objectives:

- - Safely perform nasal, oral, pharyngeal, and tracheostomy suctioning.
- - Provide tracheostomy care.
- - Explain procedure to patient.
- - Adapt procedure to reflect variations across the life span.
- - Document actions and observations.
- - Recognize and report significant deviations from norms.

***Unit: Nursing Skills: 23: Chapter 23 IV Therapy Management***

Learning Objectives:

- - Inspect established IV site for deviations from normal.
- - Prepare and safely administer primary and secondary IV fluids and medication.
- - Calculate and ensure designated flow rate.
- - Change IV tubing.
- - Change IV site dressing.
- - Discontinue short-term peripheral IV.
- - Modify the procedure to reflect variations across the life span.
- - Document actions and observation.
- - Report significant deviations from norms.

***Unit: Nursing Skills: 24: Answer Keys***

Learning Objectives:

- - Completion

## Nutrition Essentials

### *Unit: HLTH 09: Nutrition Essentials: CH01.00: Chapter 1: Introduction to Nutrition*

#### Learning Objectives:

- - Define health, nutrition, and disease
- - List and describe the characteristics used to assess health status of an individual.
- - Explain the difference between primary and secondary nutrient deficiency.
- - Differentiate among risk factors, signs, and symptoms.
- - Define the word “nutrient” and differentiate among the six classes of nutrients essential for health.
- - Explain how energy values of food are determined, and list the three energy-yielding nutrients and their energy contribution.
- - Describe measures of food quality and be able to calculate and compare energy densities of foods.
- - Describe the importance of research and scientific methods to understanding nutrition.
- - Analyze sources of nutrition information for reliability and credibility.

## Personal Care Assistant

### *Unit: HLTH 06: 01: Personal Care Assistant: Chapter 1*

#### Learning Objectives:

- - Explain what a germ (microbe) is, and use proper terminology when discussing infectious diseases
- - Explain how microbes are transmitted
- - Explain the difference between clean and contaminated in the medical field
- - Explain what is meant by Infection Control Practices
- - Explain Healthcare Acquired Infections and Multi Drug Resistant Organisms
- - Describe the chain of infection
- - Describe the modes of transmission
- - Recognize signs and symptoms of Infection
- - Identify types of PPE and their uses
- - Explain proper donning and doffing of PPE
- - Describe respiratory hygiene
- - Identify proper procedures when assisting with feeding, handling soiled laundry, and disposing of waste
- - Differentiate between the three levels of decontamination: cleaning, disinfecting and sterilizing
- - Identify the signage and the appropriate PPE for each isolation precaution

- - Identify common infections and which infections require isolation techniques
- - Define the precautions for Contact, Droplet and Airborne Isolation protocol
- - Implement isolation and special barrier precautions

***Unit: HLTH 06: 02: Personal Care Assistant: Chapter 2***

Learning Objectives:

- - Define the care team and the roles of each member
- - Identify professional behaviours for medical personnel
- - Identify different methods of understanding and the communication process
- - Differentiate between verbal and non-verbal communication

***Unit: HLTH 06: 03: Personal Care Assistant: Chapter 3***

Learning Objectives:

- - Measure health across multiple dimensions
- - Discuss the functions and parts of the major body systems
- - Link illnesses to a specific body system
- - Identify several common illnesses and how to spot them
- - Apply a checklist to identify key changes in clients' health

***Unit: HLTH 06: 04: Personal Care Assistant: Chapter 4***

Learning Objectives:

- - Demonstrate principles of good body mechanics when lifting, transferring and providing patient care

***Unit: HLTH 06: 05: Personal Care Assistant: Chapter 5***

Learning Objectives:

- - Explain the importance of personal hygiene and grooming to mental and physical health
- - Define the fundamental elements of personal hygiene and grooming

***Unit: HLTH 06: 06: Personal Care Assistant: Chapter 6***

Learning Objectives:

- - Identify the body parts that are involved in eating
- - Explain the importance of a balanced diet for client's information
- - Explain how nutrient needs change dependent on life changes
- - Demonstrate safe food handling practices with considerations of client's specific needs and limitations

## Pointful Education

### Career Exploration in Healthcare

#### *Unit: Module 00: Career Exploration in Healthcare*

Learning Objectives:

- - Completion

#### *Unit: Module 01: Timeline of Healthcare Careers*

Learning Objectives:

- - Construct the timeline of health care careers.
- - Identify prominent historical figures in Health Care.
- - Describe the progression of health care in the United States.
- - Discuss how robotics will change the future of Health Care.
- - Discuss the impact that artificial intelligence will have on the future of Health Care.

#### *Unit: Module 02: The Physician and the Physician's Assistant*

Learning Objectives:

- - Describe the roles of the Physician's Assistant and the Physician including key responsibilities and education requirements.
- - Define "Quality Healthcare" within the role of the Physician and the Physician's Assistant.
- - Compare and contrast the physical, ethical, and legal responsibilities of the Physician and the Physician's Assistant.
- - Identify current insurance types in the United States.
- - Analyze the impact of insurance to the Health Care industry.
- - Analyze the HIPPA law as it applies to health care professionals.

#### *Unit: Module 03: The Pharmacist*

Learning Objectives:

- - Describe the roles of the Pharmacist including key responsibilities and education requirements.
- - Define "Quality Healthcare" within the role of the Pharmacist.
- - Identify the physical responsibilities of the Pharmacist.
- - Evaluate pharmaceutical specialties.
- - Compare the ethical and legal responsibilities of the Pharmacist with the prescribing physician.

- - Discuss the future of Pharmacy as it relates to the growing and changing drug industry within the United States.

#### ***Unit: Module 04: The Physical Therapist***

##### Learning Objectives:

- - Describe the roles of the Physical Therapist and Physical Therapy Assistant, including key responsibilities and education requirements.
- - Define “Quality Healthcare” within the role of the Physical Therapist.
- - Identify the physical responsibilities of the Physical Therapist.
- - Analyze the ethical and legal responsibilities of the Physical Therapist.
- - Discuss technological advancements which have impacted the future of Physical Therapy.

#### ***Unit: Module 05: The Healthcare Information Technology Manager***

##### Learning Objectives:

- - Outline the history of technology in medicine and healthcare.
- - Describe the challenges of record-keeping and cybersecurity within healthcare.
- - Evaluate the roles of the Healthcare IT Manager including key responsibilities and education requirements. I
- - Identify the physical responsibilities of the Healthcare IT Manager.
- - Recognize various electronic medical record software systems.
- - Analyze the ethical and legal responsibilities of the Healthcare IT Manager.
- - Identify the future impact to the role of the Nurse with the introduction of a Healthcare IT Manager.

#### ***Unit: Module 06: The Occupational Therapist***

##### Learning Objectives:

- - Describe the roles of the Occupational Therapist including key responsibilities and education requirements.
- - Define “Quality Healthcare” within the role of Occupational Therapist.
- - Identify the physical responsibilities of the Occupational Therapist.
- - Analyze the ethical and legal responsibilities of the Occupational Therapist.
- - Identify the future impact to the role of the Occupational Therapist with the introduction of new and emerging technology.

#### ***Unit: Module 07: The Technician***

##### Learning Objectives:

- - Describe the roles of the Technician including key responsibilities and education requirements.
- - Define “Quality Healthcare” within the roles of the Technician.
- - Identify the physical responsibilities of the Technician.
- - Analyze the ethical and legal responsibilities of the Technician.
- - Identify the future impact to the role of the Physician with the introduction of the Technician.

#### ***Unit: Module 08: The Dentist***

##### Learning Objectives:

- - Describe the role of the Dentist including key responsibilities and education requirements.
- - Define “Quality Healthcare” within the role of the Dentist.
- - Identify the physical responsibilities of the Dentist.
- - Analyze the ethical and legal responsibilities of the Dentist.
- - Identify the future impact to the role of the Dentist with the introduction of new and emerging technologies.

#### ***Unit: Module 09: The Paramedic***

##### Learning Objectives:

- - Describe the role of the Paramedic including key responsibilities and education requirements.
- - Define “Quality Healthcare” within the role of the Paramedic.
- - Identify the physical responsibilities of the Paramedic.
- - Analyze the ethical and legal responsibilities of the Paramedic.
- - Identify the factors that will lead to the growth of the Paramedic profession.

#### ***Unit: Module 10: The Nurse***

##### Learning Objectives:

- - Describe the role of the Nurse including key responsibilities and education requirements.
- - Define “Quality Healthcare” within the role of the Nurse.
- - Identify the physical responsibilities of the Nurse.
- - Analyze the ethical and legal responsibilities of the Nurse.
- - Describe the impact to the role of the Nurse with new and emerging technology.

#### ***Unit: Module 11: Final Exam***

##### Learning Objectives:

- - Completion

## Healthcare Management and Information Systems

### *Unit: HMIS 01: Healthcare*

#### Learning Objectives:

- - Recognize basic characteristics, interrelationships and services of different types of healthcare organizations (e.g., hospitals, clinics, physician practices, ambulatory centers, community health organizations, and urgent care.)
- - Identify the types of inpatient and outpatient healthcare services.
- - Demonstrate knowledge of the various healthcare services provided at the federal level.
- - Determine the various positions and departments within healthcare organizations.
- - Explore healthcare regulations and financing.

### *Unit: HMIS 02: Technology*

#### Learning Objectives:

- - Recognize trends in healthcare technology (e.g., telemedicine, patient portals, wearable devices, 3D printing)
- - Identify cost and quality-of-care concerns that drive Health IT use.
- - Describe the computer software used in Health IT.
- - Analyze the evolution of electronic Health Record Applications.
- - Evaluate the trends affecting Health IT, IT Infrastructure, and the use of applications.

### *Unit: HMIS 03: Clinical Informatics*

#### Learning Objectives:

- - Identify basic clinical vocabulary/terms frequently represented in healthcare informatics (e.g., dosage frequency, dosage routes, body systems)
- - Identify basic healthcare IT vocabulary/terms frequently represented in healthcare informatics (e.g., LAN, SMS, VPN)
- - Identify basic clinical metrics frequently represented in informatics
- - Identify and support opportunities to optimize clinical effectiveness and efficiencies
- - Understand various data visualization techniques (e.g., tables, graphs, charts)
- - Maintain clinical content and decision-support tools

### *Unit: HMIS 04: The Systems Development Life Cycle Part I*

#### Learning Objectives:

- - Explore the Systems Development Life Cycle.



- - Conduct basic analysis and interpretation including Requests for Information, Requests for Proposals, and Non-Disclosure Agreements.
- - Explore design concepts including useability, User-Centered Design, and data organization.
- - Evaluate requirement gathering and Project Management Plans.
- - Analyze the components of Business Continuity Planning.

#### ***Unit: HMIS 05: The Systems Development Life Cycle Part II***

##### Learning Objectives:

- - Understand the process of successful system selection and EHR certifications
- - Identify Interoperability and Data Exchange standards as well as vendor-specific considerations.
- - Explore implementation and support systems.
- - Analyze the components of testing and evaluation.
- - Evaluate the privacy and security considerations for Health IT.

#### ***Unit: HMIS 06: Communication***

##### Learning Objectives:

- - Apply basic speaking and active listening skills with meaningful feedback.
- - Apply basic observational skills and related documentation strategies in written and oral form.
- - Identify characteristics of successful and unsuccessful communication including barriers.
- - Recognize verbal and non-verbal cues.
- - Demonstrate written communication including emails using correct spelling, grammar, formatting, and confidentiality.
- - Demonstrate ability to create professional correspondence using appropriate email practices and etiquette.

#### ***Unit: HMIS 07: Management and Leadership Part I***

##### Learning Objectives:

- - Assess the organizational environment (e.g., corporate culture, values, and drivers)
- - Understand components of an IT strategic plan (e.g., process maturity and growth, gap analysis, quality improvement, organizational alignment, roles and responsibilities, performance measurement)
- - Gather and compile metrics to monitor and assess specific organizational performance indicators
- - Monitor, assess and report on key performance indicators of systems effectiveness
- - Comply with legal and regulatory standards

- - Understand and comply with the organization's ethical business principles

*Unit: HMIS 08: Management and Leadership Part II*

Learning Objectives:

- - Prepare and deliver business communications (e.g., presentations, reports, project plans)
- - Maintain awareness of emerging industry trends
- - Identify and recommend strategies to mitigate organizational risk
- - Maintain effective and ethical working relationships with internal and external stakeholders (e.g., clinicians, vendors, partners)
- - Identify and provide data to support recommendations for decision-makers
- - Understand and support organizational change management processes
- - Understand individual and team roles, responsibilities, and job descriptions

*Unit: HMIS 00: Start Here*

No Learning Objectives available.

*Unit: HMIS 09: Final Exam*

No Learning Objectives available.

## Human Services

### Open Textbooks

#### Nutrition Essentials

*Unit: HLTH 09: Nutrition Essentials: CH01.00: Chapter 1: Introduction to Nutrition*

Learning Objectives:

- - Define health, nutrition, and disease
- - List and describe the characteristics used to assess health status of an individual.
- - Explain the difference between primary and secondary nutrient deficiency.
- - Differentiate among risk factors, signs, and symptoms.
- - Define the word “nutrient” and differentiate among the six classes of nutrients essential for health.
- - Explain how energy values of food are determined, and list the three energy-yielding nutrients and their energy contribution.
- - Describe measures of food quality and be able to calculate and compare energy densities of foods.

- - Describe the importance of research and scientific methods to understanding nutrition.
- - Analyze sources of nutrition information for reliability and credibility.

## Information Technology

### GCFGlobal Publisher

#### Computer Basics

##### *Unit: Computer Basics 00: Introduction*

Learning Objectives:

- - Understand What is a computer?
- - Understand hardware vs. software
- - Understand what are the different types of computers
- - Understand PCs and Macs

##### *Unit: Computer Basics 01: Hardware Basics*

Learning Objectives:

- - Understand Basic Parts of a Computer
- - Understand Buttons and Ports on a Computer
- - Understand Inside a computer
- - Understand Laptop Computers
- - Understand Mobile Devices

##### *Unit: Computer Basics 02: Software Basics*

Learning Objectives:

- - Understand Operating Systems
- - Understand Applications

##### *Unit: Computer Basics 03: Using a Computer*

Learning Objectives:

- - Understand Connecting to the Internet
- - Understand Getting started with the Internet
- - Understand the Cloud

##### *Unit: Computer Basics 04: Using the Internet*

Learning Objectives:

- - Understand the Cloud
- - Understand Getting started with the Internet
- - Understand Connecting to the Internet

#### ***Unit: Computer Basics 05: Safety and Maintenance***

Learning Objectives:

- - Understand Keeping Your Computer Clean
- - Understand Protecting Your Computer
- - Understand Creating a Safe Workspace
- - Understand Basic Troubleshooting Techniques

#### ***Unit: Computer Basics 06: Extras***

Learning Objectives:

- - Understand How to Use Your Computer's Built-in Help
- - Understand Learning a New Program
- - Understand Bringing Your Files with You
- - Understand Using Accessibility Features

#### ***Unit: Computer Basics 07: Quiz***

Learning Objectives:

- - Completion

## **GoSkills**

### **Intro to Ruby Programming**

#### ***Unit: Introduction***

Learning Objectives:

- - Install Sublime and Git Bash.
- - Install Ruby.

#### ***Unit: Ruby Programming Basics***

Learning Objectives:

- - Store data in variables and apply arithmetic, comparison and assignment operators.
- - Comment code and deal with errors.

#### ***Unit: Intermediate Ruby Concepts***

Learning Objectives:

- - Create and use arrays and multi-dimensional arrays.
- - Understand how and when to use loops, including while, until, for and each loops.
- - Create, use and manipulate hashes.
- - Use classes, class getters and class setters.

#### ***Unit: Advanced Ruby Concepts***

Learning Objectives:

- - Apply different modes for opening files and how to write and append data to a file.
- - Install and use a third party Gem in your program for extra functionality.

#### ***Unit: Fun with Ruby - Build a Math Flashcard Game!***

Learning Objectives:

- - Build a math flashcard app.

#### ***Unit: Intro to Ruby Programming: Final Exam***

Learning Objectives:

- - Completion

### **Introduction to CSS**

#### ***Unit: Getting Started with CSS***

Learning Objectives:

- - Understanding the basic CSS syntax.

#### ***Unit: Basic CSS***

Learning Objectives:

- - Add background colors, images and borders.
- - Understand the difference between margins and padding.
- - Change the formatting and alignment of text.
- - Style links, lists and manipulate fonts.
- - Understand CSS pseudo-classes and how to use them.

#### ***Unit: Intermediate CSS***

Learning Objectives:

- - Use gradients, shadows and rounded corners.
- - Add buttons and pagination for easy navigation.

***Unit: Responsive Mobile Design with CSS:***

Learning Objectives:

- - Make your design responsive for mobile devices.

***Unit: Using the Bootstrap CSS Framework***

Learning Objectives:

- - Setting up, using and modifying Bootstrap.

***Unit: Conclusion***

Learning Objectives:

- - Understand how HTML, CSS and JavaScript work together.

***Unit: Introduction to CSS: Badge Test***

Learning Objectives:

- - Completion

***Introduction to Data Analysis with Python******Unit: Development Environment Setup***

Learning Objectives:

- - I can install Python on my operating system.

***Unit: Numpy***

Learning Objectives:

- - Import and install Numpy.
- - Use Numpy arrays, operations, and universal functions.

***Unit: Pandas***

Learning Objectives:

- - Install Pandas data analysis toolkit.
- - Use Pandas series and DataFrames.
- - Clean and prepare your data with Pandas DataFrames.

***Unit: Pandas Visualization***

Learning Objectives:

- - Create data visualizations with Pandas.

***Unit: Linear Regression With SciKitLearn***

Learning Objectives:

- - Install SciKitLearn to make predictions using essential machine learning.
- - Create and analyze a linear regression model.

***Unit: Intro to Data Analysis With Python: Final Exam***

Learning Objectives:

- - Completion

**Introduction to HTML*****Unit: Setting up Your Development Environment***

Learning Objectives:

- - Install the Sublime Text Editor.

***Unit: Basic HTML Concepts and Code***

Learning Objectives:

- - Author basic html tags and attributes.
- - Create paragraphs, line breaks and headings.
- - Format text to be bold, italic, block quotes.
- - Style HTML elements with an inline CSS style tag.
- - Add images to a website and make them clickable as links.

***Unit: Intermediate HTML***

Learning Objectives:

- - Create HTML tables, lists and forms.
- - Comment code and where to do it.
- - Create HTML links to navigate between different web pages or sites.

***Unit: Real World Examples - Build a Resume Website Using Bootstrap***

Learning Objectives:

- - Build a resume website using the Bootstrap CSS framework and templates.
- - Make your website mobile responsive with Bootstrap.

***Unit: Real World Examples - Build a Resume Website Using Templates***

Learning Objectives:

- - Back up your code using Github and push live code to Heroku.

***Unit: HTML Intro: Final Test***

Learning Objectives:

- - Completion

***Introduction to JavaScript******Unit: Using JavaScript For The Web***

Learning Objectives:

- - Make changes to HTML elements by manipulating the DOM
- - Make changes to CSS styles on a web page

***Unit: AJAX***

Learning Objectives:

- - Understand AJAX requests and responses

***Unit: Building a Math Flashcard App***

Learning Objectives:

- - Put together everything you've learned by building a math flashcard app with JavaScript and AJAX

***Unit: Course Introduction***

Learning Objectives:

- - Learn the syntax and output of JavaScript code.

***Unit: Basic JavaScript***

Learning Objectives:

- - Understand JavaScript statements and learn how to comment code.
- - Store data in variables and apply arithmetic, comparison and logic operators.
- - Understand the difference between strings, numbers, and Boolean data types.
- - Utilize arrays to contain multiple items.

***Unit: Intermediate JavaScript***

Learning Objectives:

- - Master intermediate JavaScript such as objects, functions and conditional statements.

***Unit: JavaScript Intro: Final Test***

Learning Objectives:



- - Completion

## Introduction to PHP

### *Unit: PHP Programming Basics*

Learning Objectives:

- - Learn the different data types for PHP, including string, integer, float, and boolean
- - How to use arithmetic, assignment, comparison, increment, logic and string operators
- - Use if/else/elseif statements to test against conditions
- - Understand basic arrays and how to sort arrays the quick and easy way
- - How to process HTML Forms with GET vs POST
- - Create and issue cookies to your website visitors
- - Pass information between pages with Sessions

### *Unit: Building a Math Flashcard App*

Learning Objectives:

- - Build a math flashcard app

### *Unit: PHP Intro: Final Test*

Learning Objectives:

- - Completion

### *Unit: Introduction - Setting Up a Development Environment*

Learning Objectives:

- - Understand the fundamentals of how PHP works and the client/server relationship
- - Set up your development environment
- - Back up your code and set up version control with Github

### *Unit: Templating Out a Website*

Learning Objectives:

- - Complete templating out a website

## Introduction to Python

### *Unit: Intro to Python: 01 Intro and Setup*

Learning Objectives:

- - Install Python on my operating system

***Unit: Intro to Python: 02 Python Basics***

Learning Objectives:

- - Understand data types including strings, numbers, lists, tuples, variables, and dictionaries
- - Use assignment operators

***Unit: Intro to Python: 03 Intermediate Python***

Learning Objectives:

- - Convert data types
- - Use comparison operators and conditional statements like if, else, and elif
- - Use membership and identity operators
- - Import and create your own modules
- - Write loops and loop control statements like while and for loops
- - Write functions
- - Open, close, rename and delete files

***Unit: Intro to Python: 04 Advanced Python***

Learning Objectives:

- - Create and initialize classes, and calling attributes
- - Use class inheritance for classes to interact with each other

***Unit: Intro to Python: 05 Final Exam***

Learning Objectives:

- - Completion

**MOS Excel 2019 - GoSkills [sample]*****Unit: 4.0 : Perform Operations by using Formulas and Functions***

Learning Objectives:

- - Insert relative, absolute, and mixed reference
- - Reference named ranges and named tables in formulas
- - Perform calculations by using the AVERAGE(), MAX(), MIN(), and SUM() functions
- - Count cells by using the COUNT(), COUNTA(), and COUNTBLANK() functions
- - Perform conditional operations by using the IF() function
- - Format text by using RIGHT(), LEFT(), and MID() functions
- - Format text by using UPPER(), LOWER(), and LEN() functions
- - Format text by using the CONCAT() and TEXTJOIN() functions

## Microsoft Excel - Basic & Advanced

### *Unit: EXL Basic & Adv: 01 Getting to Know Excel*

#### Learning Objectives:

- - Identify the terminology and elements of the ribbon.
- - Recognize the main terms used to describe Excel's work canvas.
- - Navigate the Excel Interface.
- - Create and format a basic Excel file.
- - Customize the Quick Access toolbar.
- - Perform calculations by using the AVERAGE(), MAX(), MIN(), and SUM() functions.

### *Unit: EXL Basic & Adv: 02 Essential Formula Knowledge*

#### Learning Objectives:

- - Understand Excel Formula and Function Anatomy.
- - Perform calculations by using the AVERAGE(), MAX(), MIN(), and SUM() functions.
- - Count cells by using the COUNT(), COUNTA(), and COUNTBLANK() functions.
- - Perform conditional operations by using the IF() function.
- - Format text by using RIGHT(), LEFT(), and MID() functions.
- - Understand how dates and time work in Excel using the TODAY, YEAR, MONTH, DAY and DATE functions.

### *Unit: EXL Basic & Adv: 03 Intermediate Formula Knowledge*

#### Learning Objectives:

- - Understand the components of formula auditing including racing precedents, tracing dependents, and formula evaluation.
- - Perform conditional operations by using the IF() function.
- - Insert and remove hyperlinks.
- - Perform temporal functions by using EOMONTH and EDATE functions.
- - Use lookup methods including VLOOKUP, INDEX, MATCH, HLOOKUP and the basics of XLOOKUP.

### *Unit: EXL Basic & Adv: 04 Optimizing Data*

#### Learning Objectives:

- - Sort data by a single column or multiple columns.
- - Filter data for specific words, dates and apply multiple filters to a single data table.
- - Define a named range.
- - Create Excel tables from cell ranges.
- - Record macros.

***Unit: EXL Basic & Adv: 05 Data Analysis***

Learning Objectives:

- - Create, format, and calculate fields in Pivot Tables.
- - Perform what-if analysis in Excel using the Scenario Manager and Goal-Seek.

***Unit: EXL Basic & Adv: 06 Getting and Transforming Data***

Learning Objectives:

- - Transform data through unpivoting data.
- - Reshape data using Power Query.
- - Import data into workbooks.
- - Manually append tables using Power Query.

***Unit: EXL Basic & Adv: 07 Presenting and Reporting***

Learning Objectives:

- - Format cells and ranges.
- - Use Excel's outlining tools.
- - Apply number formats.
- - Apply built-in and custom conditional formatting.
- - Remove conditional formatting.
- - Create charts of different styles, including column charts, bar charts, pie charts, line charts, and combination line and area charts.
- - Add data series to charts.
- - Apply chart layouts.
- - Apply chart styles.

***Unit: EXL Basic & Adv: 08 Validating and Updating***

Learning Objectives:

- - Use Data Validation to ensure that users enter valid data in input cells.
- - Create a drop down list of valid options using data validation.
- - Create, review and print Excel Comments and Notes.
- - Apply cell styles.

***Unit: EXL Basic & Adv: 09 Advanced Formulas***

Learning Objectives:

- - Write a formula that refers to more than one cell, a table column/row, or an entire table
- - Filter records with a single condition or multiple conditions.

- - Use basic functions of XLOOKUPS.

#### ***Unit: EXL Basic & Adv: 10 Preparing to Deploy***

Learning Objectives:

- - Display and modify workbook content in different views, including custom views.
- - Modify page setup.
- - Adjust row height and column width.
- - Customize headers and footers.
- - Understand the setup process and weaknesses of Excel's security model.

#### ***Unit: EXL Basic & Adv: 11 Final Exam***

Learning Objectives:

- - Completion

#### **Microsoft PowerPoint 2010-2019**

##### ***Unit: PPT 2019: 01 Interface and Basics***

Learning Objectives:

- - Create a new file and set basic file properties
- - Modify slide master content
- - Use the Outline Pane
- - Display presentations in different views
- - Present slide shows by using Presenter View
- - Modify the notes master
- - Print notes pages
- - Customize the ribbon or the Quick Access Toolbar to find and use hidden commands
- - Change the slide master theme or background

##### ***Unit: PPT 2019: 05 Animations and Transitions***

Learning Objectives:

- - Animate text and graphic elements
- - Configure animation effects
- - Configure animation paths
- - Apply and configure slide transitions

##### ***Unit: PPT 2019: 02 Adding Text and Shapes***

Learning Objectives:

- - Create slide layouts

- - Modify slide layouts
- - Apply formatting and styles to text
- - Insert and change shapes
- - Add text to shapes and text boxes
- - Duplicate and position shapes on slides
- - Align shapes, images, and text boxes
- - Display alignment tools
- - Group shapes and images

***Unit: PPT 2019: 06 Slide Tasks***

Learning Objectives:

- - Duplicate slides
- - Modify slide order
- - Create sections
- - Rename sections
- - Reset various types of object back to their original format

***Unit: PPT 2019: 03 Pictures***

Learning Objectives:

- - Insert and format images
- - Remove picture backgrounds
- - Use a photo album in a PowerPoint presentation

***Unit: PPT 2019: 04 Info-graphics and Media***

Learning Objectives:

- - Insert SmartArt graphics
- - Add and modify SmartArt graphic content
- - Create and insert charts
- - Modify charts
- - Create and insert tables
- - Apply built-in table styles
- - Insert audio and video clips

***Unit: PPT 2019: 07 Delivering Your Presentation***

Learning Objectives:

- - Print all or part of a presentation
- - Print notes pages
- - Print handouts

- - Print in color, grayscale, or black and white
- - Rehearse slide show timing
- - Set up slide show recording options
- - Configure slide show options
- - Present slide shows by using Presenter View

#### ***Unit: PPT 2019: 08 New Design Features***

Learning Objectives:

- - Configure transition effects
- - Insert icons from the internet on your computer
- - Insert 3D models
- - Modify 3D models
- - Animate 3D models
- - Insert Summary Zoom slides

#### ***Unit: PPT 2019: 09 Final Exam***

Learning Objectives:

- - Completion

#### **Microsoft Word Basic and Advanced**

##### ***Unit: MS Word Basic & Adv: 01 Word Screen Elements***

Learning Objectives:

- - Operate the ribbon functionality
- - Customize the Quick Access Toolbar
- - Control where you type and how to navigate within the page
- - Save documents in alternative file formats
- - Format fonts
- - Learn the base rules for letter layout
- - Use cut, copy, and paste functions

##### ***Unit: MS Word Basic & Adv: 02 Essential Formatting Knowledge- The Home Ribbon***

Learning Objectives:

- - Apply style sets
- - Format text with fonts and colors
- - Apply formatting by using Format Painter
- - Clear formatting
- - Apply text effects

- - Apply basic paragraph format and alignment
- - Apply background colors or borders to paragraphs
- - Format paragraphs as numbered and bulleted lists
- - Change bullet characters and number formats
- - Set line and paragraph spacing and indentation
- - Find and replace text

***Unit: MS Word Basic & Adv: 03 The File Ribbon***

Learning Objectives:

- - Find and use pre-designed templates
- - Find and use "Recent Files"
- - Share documents electronically
- - Use "File, Info" options to work on the technical file attributes

***Unit: MS Word Basic & Adv: 04 The View Ribbon***

Learning Objectives:

- - Apply different available document views
- - Use the Navigation Pane to assist with document management
- - Add the Navigation pane and zoom in and out of the document
- - Use multiple windows to view the same or various documents side-by-side

***Unit: MS Word Basic & Adv: 05 Intermediate Formula Knowledge- The Insert Ribbon***

Learning Objectives:

- - Insert page, section, and column breaks
- - Add a pre-designed cover page to your document
- - Convert text to tables and vis versa
- - Create and resize tables, rows, and columns
- - Insert pictures and clip art

***Unit: MS Word Basic & Adv: 07 References Ribbon***

Learning Objectives:

- - Insert tables of contents
- - Customize and update tables of contents
- - Create an advanced level TOC using "Mark Entry"
- - Insert footnotes and endnotes
- - Create and modify bibliography citation sources
- - Insert citations for bibliographies
- - Create and link captions to images and text



- - Create an Index organized by topic or keyword

#### ***Unit: MS Word Basic & Adv: 08 Custom Styles***

Learning Objectives:

- - Format text and capture it inside the Style Gallery for future use.
- - Edit or remove styles from the Style Gallery
- - Use reveal formatting
- - Use the Selection Tool

#### ***Unit: MS Word Basic & Adv: 10 Review Ribbons***

Learning Objectives:

- - Use features included in spellcheck, find a better word, or count the total words in a document
- - Customize Word to use a different language for the document text, display, and help text. Also translate an entire document or just one word
- - Add, review, reply to, resolve, and delete comments
- - Track changes, and review, accept, and reject these changes
- - Lock and unlock change tracking
- - Use the compare documents feature

#### ***Unit: MS Word Basic & Adv: 06 Essential Page Layout Ribbon***

Learning Objectives:

- - Set and apply page margins
- - Change paper size and orientation depending on the document type
- - Format text in multiple columns
- - Set line and paragraph spacing and indentation
- - Modify print settings

#### ***Unit: MS Word Basic & Adv: 09 Mailing Ribbons***

Learning Objectives:

- - Use the mailings ribbon to print an envelope or label for postal mail
- - Auto-populate a sheet of labels with text pulled from a list
- - Merge mailing lists onto envelopes, into a form letter, or into an email
- - Troubleshoot label margins and email merges issues

#### ***Unit: MS Word Basic & Adv: 11 Final Exam***

Learning Objectives:

- - Completion

## Ruby on Rails for Web Development

### *Unit: Setting Up Your Development Environment*

Learning Objectives:

- - Download, install, and use Ruby on Rails
- - Set up my development environment with Github, BitBucket and Heroku
- - Add, install and remove Gems to add third party functionality to my Rails app

## SQL Introduction

### *Unit: Intro to Databases & SQL*

Learning Objectives:

- - Understand the structure of databases with RDBMS concept

### *Unit: Microsoft SQL Server & Management Studio Setup*

Learning Objectives:

- - Set up Microsoft SQL Server and SQL Management Studio
- - Create a new database and add data to tables
- - Back up and restore your database to protect your data

### *Unit: Selecting & Filtering Data 1*

Learning Objectives:

- - Use a SELECT statement to retrieve data
- - Filter records with WHERE, AND, OR clauses
- - Arrange results with ORDER BY and GROUP BY clauses

### *Unit: Introduction to SQL: Final Test*

Learning Objectives:

- - Completion

### *Unit: Selecting & Filtering Data 2*

Learning Objectives:

- - Search within aggregate groups with HAVING clause
- - Calculate data with Count, Average, and Sum functions

### *Unit: Inserting, Updating & Deleting Data*

Learning Objectives:

- - Update and remove data with UPDATE and DELETE statements

### ***Unit: Combining & Joining Multiple Tables***

Learning Objectives:

- - Combine and join tables with JOIN clauses

### ***Unit: Other SQL Concepts***

Learning Objectives:

- - Define these SQL concepts: subqueries, indexing, and primary key

## **Infosec**

### **Digital Forensics**

#### ***Unit: DF (01) Digital Forensics: Introduction to File Systems***

Learning Objectives:

- - Examine different Windows and Linux file systems
- - Partition and format file systems in Windows
- - Format and wipe Linux file system

#### ***Unit: DF (04) Digital Forensics: Drive Letter Assignments in Linux***

Learning Objectives:

- - Examine Linux drive letter assignments and mount drives
- - Create primary and extended partitions in Linux
- - Format disks in Linux and utilize the storage

#### ***Unit: DF (05) Digital Forensics: The Imaging Process***

Learning Objectives:

- - Use FTK Imager.
- - Use HELIX to image a system.
- - Use Kali 2 to image a system.

#### ***Unit: DF (02) Digital Forensics: Common Locations of Windows Artifacts***

Learning Objectives:

- - Examine Windows Event Logs, IIS Logs, and Scheduled Tasks
- - Examine the Startup, Windows, and System32 Folders

#### ***Unit: DF (03) Digital Forensics: Hashing Data Sets***

Learning Objectives:

- - Image and Hash a Disk and Verify the Hashes of the Image
- - Use Kali to Hash Images, Disks, and Partitions
- - Use HashCalc to Verify Hashes

#### ***Unit: DF (06) Digital Forensics: Introduction to Single Purpose Forensic Tools***

Learning Objectives:

- - Use file hashing tools to verify integrity
- - Mount a partition with deleted files and folders
- - Use Foremost to carve files
- - Use a HEX editor

#### ***Unit: DF (07) Digital Forensics: Introduction to Autopsy Forensic Browser***

Learning Objectives:

- - Install the Autopsy forensic browser
- - Create a case in Autopsy forensic browser
- - Examine an image with Autopsy
- - Generate a report

#### ***Unit: DF (08) Digital Forensics: FAT File System***

Learning Objectives:

- - Examine the FAT and NTFS file systems
- - Use a HEX editor to explore a FAT partition
- - Verify and view image details
- - Analyze a FAT partition with Autopsy

#### ***Unit: DF (09) Digital Forensics: The NTFS File System***

Learning Objectives:

- - Examine the NTFS file system
- - Use a HEX editor to explore an NTFS partition
- - Verify and view the image details
- - Analyze an NTFS partition with Autopsy

#### ***Unit: DF (10) Digital Forensics: Browser Artifact Analysis***

Learning Objectives:

- - Meet my browser
- - Analyze Internet Explorer
- - Analyze Google Chrome
- - Analyze Mozilla Firefox

***Unit: DF (14) Digital Forensics: Memory Analysis***

Learning Objectives:

- - Obtain a dump of physical memory using DumpIt
- - Attack the victim system with Armitage
- - Use Volatility to determine remote connections

***Unit: DF (11) Digital Forensics: Communication Artifacts***

Learning Objectives:

- - Use email messages and programs
- - Examine emails in network traffic
- - Use internet relay chat

***Unit: DF (13) Digital Forensics: Log Analysis***

Learning Objectives:

- - Examine Windows Event Logs
- - Examine Windows IIS Logs
- - Examine Linux Log Files

***Unit: DF (12) Digital Forensics: User Profiles and the Windows Registry***

Learning Objectives:

- - Capture a live Windows XP registry
- - Analyze the registry hives using RegViewer
- - Analyze the registry hives using RegRipper

***Unit: DF (15) Digital Forensics: Forensic Case Capstone***

Learning Objectives:

- - Analyze and Report in Autopsy
- - Verify and View the Image Details
- - Analyze an NTFS partition with Autopsy

**Ethical Hacking & Systems Defense*****Unit: EHSD (01) Ethical Hacking & Systems Defense: Performing Reconnaissance from the WAN***

Learning Objectives:

- - Use nmap to perform banner grabbing.
- - Use nmap to determine the operating system and applications running on a system.
- - Use tools to capture credentials on a system.

- - Use remote desktop to log in to a system from captured credentials.

***Unit: EHSD (02) Ethical Hacking & Systems Defense: Scanning the Network on the LAN***

Learning Objectives:

- - Use nmap to do a ping scan.
- - Use Metasploit and Armitage to exploit vulnerabilities and breach a system.

***Unit: EHSD (06) Ethical Hacking & Systems Defense: Capturing and Analyzing Network Traffic Using a Sniffer***

Learning Objectives:

- - Configure the network interface to allow a sniffer to capture packets.
- - Generate and capture traffic on the network.
- - Analyze captured traffic in Wireshark.

***Unit: EHSD (03) Ethical Hacking & Systems Defense: Enumerating Hosts using Wireshark, Windows, and Linux Commands***

Learning Objectives:

- - Use Armitage to scan a network.
- - Use system commands to enumerate or list resources on a target system.

***Unit: EHSD (05) Ethical Hacking & Systems Defense: Crafting and Deploying Malware Using a Remote Access Trojan (RAT)***

Learning Objectives:

- - Use nmap/Zenmap to scan a network.
- - Deploy malware on a system.
- - Use Bruter to exploit a system vulnerability.
- - Use remote desktop to breach a system.

***Unit: EHSD (04) Ethical Hacking & Systems Defense: Remote and Local Exploitation***

Learning Objectives:

- - Use nmap and OpenVas to scan a system.
- - Use Greenbone to determine vulnerabilities of a system.
- - Use Metasploit to exploit a system.
- - Use Meterpreter to breach a system.

***Unit: EHSD (07) Ethical Hacking & Systems Defense: Social Engineering Using SET***

Learning Objectives:

- - Compromise a Windows Server with the Social Engineering Toolkit
- - Execute a spear-phishing attack
- - Exploit the malware to steal data on a system

***Unit: EHSD (08) Ethical Hacking & Systems Defense: Performing a Denial of Service Attack from the WAN***

Learning Objectives:

- - Use a TCP flood to perform a denial-of-service attack.
- - Use a UDP flood to perform a denial-of-service attack.
- - Use an HTTP flood to perform a denial-of-service attack.

***Unit: EHSD (09) Ethical Hacking & Systems Defense: Using Browser Exploitation to Take Over a Host's Computer***

Learning Objectives:

- - Use Metasploit to exploit a web browser vulnerability.
- - Use spear phishing to trick a user into launching a web browser vulnerability.
- - Breach a host's computer using the web browser vulnerability.

***Unit: EHSD (10) Ethical Hacking & Systems Defense: Attacking Webservers from the WAN***

Learning Objectives:

- - Use nmap/Zenmap to scan a wide area network.
- - Use Bruter to exploit SMTP.
- - Use remote desktop with captured credentials to deface a web site.
- - Cover your tracks from the hack you just performed.

***Unit: EHSD (12) Ethical Hacking & Systems Defense: Performing SQL Injection to Manipulate Tables in a Database***

Learning Objectives:

- - Use nmap to scan a network.
- - Use brute force to crack a user name and password of a MySQL database.
- - Use the harvested credentials to exploit and breach a database.

***Unit: EHSD (15) Ethical Hacking & Systems Defense: Using Public Key Encryption to Secure Messages***

Learning Objectives:

- - Use PKI to generate a certificate for a student and administrator.
- - Use PKI to encrypt and decrypt a file.

***Unit: EHSD (11) Ethical Hacking & Systems Defense: Exploiting a Vulnerable Web Application***

Learning Objectives:

- - Use nmap to scan a network.
- - Use Metasploit and Armitage to exploit a common web server vulnerability.
- - Use Meterpreter to breach a system.

***Unit: EHSD (13) Ethical Hacking & Systems Defense: Breaking WEP and WPA and Decrypting the Traffic***

Learning Objectives:

- - Decrypt wireless network traffic that uses WEP.
- - Decrypt wireless network traffic that uses WPA.

***Unit: EHSD (14) Ethical Hacking & Systems Defense: Attacking the Firewall and Stealing Data over an Encrypted Channel***

Learning Objectives:

- - Use nmap/Zenmap to scan a network.
- - Use metasploit/meterpreter to exploit a vulnerability on a target.

**Front End Web Development*****Unit: FEWD (01) Front End Web Development: Website Development Basics***

Learning Objectives:

- - Understand file management and hierarchy for website development.
- - Identify the components of a website address, known as a Uniform Resource Locator (URL).
- - Learn to prepare website components to be uploaded to website host on the World Wide Web.

***Unit: FEWD (02) Front End Web Development: HTML5 Basics I***

Learning Objectives:

- - Learn HTML5 syntax.
- - Code the basic structure, semantic, and text support elements for a website page.
- - Save a website file.

***Unit: FEWD (08) Front End Web Development: Introduction to JavaScript***

Learning Objectives:

- - Learn JavaScript syntax.
- - Examine the Document Object Model (DOM).



- - Edit the DOM in the browser console using JavaScript.

***Unit: FEWD (03) Front End Web Development: HTML5 Basics II***

Learning Objectives:

- - Code various types of lists in HTML.
- - Code internal and external hyperlinks.
- - Code a basic HTML table.

***Unit: FEWD (06) Front End Web Development: CSS3 Basics II***

Learning Objectives:

- - Apply internal CSS to an HTML document.
- - Apply inline (embedded) CSS to elements within an HTML document.
- - Write an ID and apply it to an element within an HTML document.
- - Write a class and apply it to one or more elements within an HTML document.

***Unit: FEWD (04) Front End Web Development: HTML5 Basics III***

Learning Objectives:

- - Code an image onto a website page.
- - Code a Web form onto a website page.
- - Create a variety of form elements within a website form.

***Unit: FEWD (05) Front End Web Development: CSS3 Basics I***

Learning Objectives:

- - Understand how CSS applies to HTML content.
- - Learn CSS syntax.
- - Add styling to website page content using external CSS.

***Unit: FEWD (09) Front End Web Development: JavaScript and HTML***

Learning Objectives:

- - Use JavaScript to style HTML elements.
- - Use JavaScript to insert HTML elements.
- - Apply external JavaScript to an HTML file.

***Unit: FEWD (07) Front End Web Development: Building a website***

Learning Objectives:

- - Compose a completed website.
- - Test website for accessibility.

- - Make design selections based on standards and accessibility guidelines.

#### ***Unit: FEWD (10) Front End Web Development: Website Debugging***

Learning Objectives:

- - Practice manually debugging HTML syntax
- - Practice manually debugging CSS syntax
- - Validate website files

#### **Information Security Fundamentals**

#### ***Unit: ISF (10) Information Security Fundamentals: Breaking WEP and WPA and Decrypting the Traffic***

Learning Objectives:

- - Decrypt wireless network traffic that uses WEP
- - Decrypt wireless network traffic that uses WPA

#### ***Unit: ISF (01) Information Security Fundamentals: Securing the pfSense Firewall***

Learning Objectives:

- - Use nmap to scan for open ports on a pfSense firewall.
- - Close unnecessary ports on a pfSense firewall.
- - Add a secure service to a pfSense firewall.

#### ***Unit: ISF (02) Information Security Fundamentals: Implementing NAT and Allowing Remote Access***

Learning Objectives:

- - Configure NAT
- - Use Wireshark to understand how NAT works
- - Use remote desktop on a network

#### ***Unit: ISF (03) Information Security Fundamentals: Implementing Common Protocols and Services***

Learning Objectives:

- - Use Telnet and SSH on a network and understand why you would use one over the other.
- - Use FTP and SCP on a network and understand why you would use one over the other.
- - Use Wireshark to capture and observe network traffic.

#### ***Unit: ISF (04) Information Security Fundamentals: Examining Wireless Networks***

Learning Objectives:

- - Use Wireshark to explore wireless traffic.
- - Use Wireshark to export an image from HTTP traffic.

***Unit: ISF (14) Information Security Fundamentals: Using Active Directory in the Enterprise***

Learning Objectives:

- - Create an Organizational Unit and Users in Active Directory
- - Set a Domain Level Policy in Active Directory
- - Set an Organizational Level Policy in Active Directory

***Unit: ISF (05) Information Security Fundamentals: Implementing Security Policies on Windows and Linux***

Learning Objectives:

- - Secure the Windows login process.
- - Audit login failures.
- - Secure Linux.

***Unit: ISF (06) Information Security Fundamentals: Data Backups in Windows, BSD, and Linux***

Learning Objectives:

- - Backup pfSense Firewall.
- - Backup files in Linux.
- - Backup files in Windows.

***Unit: ISF (07) Information Security Fundamentals: Incident Response Procedures, Forensics, and Forensic Analysis***

Learning Objectives:

- - Scan a network with nmap/zenmap.
- - Exploit a system using Bruter.
- - Use remote desktop using the stolen credentials from Bruter.

***Unit: ISF (08) Information Security Fundamentals: Crafting and Deploying Malware Using a Remote Access Trojan (RAT)***

Learning Objectives:

- - Use nmap/Zenmap to scan a network.
- - Deploy malware on a system.
- - Use Bruter to exploit a system vulnerability.
- - Use remote desktop to breach a system.

***Unit: ISF (09) Information Security Fundamentals: Social Engineering Using SET***

Learning Objectives:

- - Compromise a Windows Server with the Social Engineering Toolkit
- - Execute a spear-phishing attack
- - Exploit the malware to steal data on a system

***Unit: ISF (13) Information Security Fundamentals: Patching, Securing Systems, and Configuring Anti-Virus***

Learning Objectives:

- - Exploit a Windows server that is not properly patched
- - Harden a Windows server by patching the vulnerability

***Unit: ISF (11) Information Security Fundamentals: Deep Dive in Packet Analysis - Using Wireshark and Network Miner***

Learning Objectives:

- - Use Wireshark to view protocol traffic.
- - View protocols using Wireshark.
- - Parse objects from network traffic.
- - Use NetworkMiner.

***Unit: ISF (12) Information Security Fundamentals: Remote and Local Exploitation***

Learning Objectives:

- - Use nmap and OpenVas to scan a system.
- - Use Greenbone to determine vulnerabilities of a system.
- - Use Metasploit to exploit a system.
- - Use Meterpreter to breach a system.

***Unit: ISF (15) Information Security Fundamentals: Using Public Key Encryption to Secure Messages***

Learning Objectives:

- - Use PKI to generate a certificate for a student and administrator.
- - Use PKI to encrypt and decrypt a file.

**Introduction to Operating Systems*****Unit: IOS (01) Introduction to Operating Systems: Introduction to Operating Systems***

Learning Objectives:

- - Interact with the computer via the graphical user interface and the command line interface.
- - Use task manager to manage applications and tasks.
- - Use file manager and the command line to create files and folders.
- - Use the control panel/system monitor to manage memory and devices.
- - Use the security features of both Windows and Linux.

***Unit: IOS (10) Introduction to Operating Systems: Mobile Operating Systems***

Learning Objectives:

- - Start up BlueStacks.
- - Work with Google settings
- - Install and remove Android apps
- - Configure local security in Android

***Unit: IOS (02) Introduction to Operating Systems: Computer Security Basics***

Learning Objectives:

- - Understand security policies and their application.
- - Configure peripheral security.
- - Configure Web browser security.
- - Use miscellaneous security features of an operating system.
- - Use authentication and authorization in an operating system.
- - Protect data in an operating system.

***Unit: IOS (03) Introduction to Operating Systems: Desktop Virtualization***

Learning Objectives:

- - Install and configure desktop virtualization
- - Create and configure a virtual machine
- - Download, install, and configure Windows XP mode

***Unit: IOS (04) Introduction to Operating Systems: Introduction to Windows 7***

Learning Objectives:

- - Install and configure Windows 7.
- - Use the features of Windows 7.
- - Manage a Windows 7 system.
- - Configure local security in Windows 7.

***Unit: IOS (05) Introduction to Operating Systems: Introduction to Windows 8.1***

Learning Objectives:

- - Install and configure Windows 8.1
- - Use the features of Windows 8.1
- - Manage a Windows 8.1 system
- - Configure local security in Windows 8.1

***Unit: IOS (08) Introduction to Operating Systems: Linux on the Desktop***

Learning Objectives:

- - Install and configure Linux
- - Use the features of Linux
- - Manage a Linux system
- - Configure local security in Linux

***Unit: IOS (06) Introduction to Operating Systems: Introduction to Windows 10***

Learning Objectives:

- - Install and configure Windows 10.
- - Use the features of Windows 10.
- - Manage a Windows 10 system.
- - Configure local security in Windows 10.

***Unit: IOS (07) Introduction to Operating Systems: Supporting and Troubleshooting Windows***

Learning Objectives:

- - Understand the registry
- - Understand Windows user options and power options
- - Install and manage device drivers
- - Troubleshoot common Windows problems

***Unit: IOS (09) Introduction to Operating Systems: Connecting Desktops and Laptops to Networks***

Learning Objectives:

- - Examine, set, and configure an IP address.
- - Work with Internet browsers.
- - Troubleshoot common network client problems.

***Unit: IOS (11) Introduction to Operating Systems: File Management in the Cloud***

Learning Objectives:

- - Install and configure cloud storage (e.g., Dropbox, Google Drive)
- - Use the features of cloud storage
- - Manage a cloud storage software

## Network Security Fundamentals

### *Unit: NSF (01) Network Security Fundamentals: Configuring a Windows based Firewall to Allow Incoming Traffic*

Learning Objectives:

- - Set Up Services on the Internal Network
- - Configure and Test the Windows-Based Firewall
- - Use Internal Services from an External Machine

### *Unit: NSF (02) Network Security Fundamentals: Configuring a Linux based Firewall to Allow Incoming and Outgoing Traffic*

Learning Objectives:

- - Test the Current Firewall and Install the Linux Firewall
- - Configure and Test the Linux-Based Firewall
- - Use Internal Services from an External Machine

### *Unit: NSF (13) Network Security Fundamentals: Domain Security*

Learning Objectives:

- - Join a domain
- - Create a domain account
- - Create a group policy

### *Unit: NSF (03) Network Security Fundamentals: Implementing Secure DHCP and DNS*

Learning Objectives:

- - Install and Configure DHCP
- - Secure DHCP
- - Install and Configure Secure DNS
- - Secure DNS

### *Unit: NSF (12) Network Security Fundamentals: Configuring RADIUS*

Learning Objectives:

- - Configure the RADIUS Server
- - Set up the Remote Access Policies
- - Connect to the RADIUS Server

### *Unit: NSF (15) Network Security Fundamentals: Closing Security Holes*

Learning Objectives:

- - Attack a vulnerable Windows Server with Armitage
- - Close a port on a Windows Server using the Windows Firewall
- - Patch a system with Windows Update

***Unit: NSF (04) Network Security Fundamentals: Configuring a Linux based Firewall to Allow Outgoing Traffic***

Learning Objectives:

- - Set up and test external services
- - Install the Linux-Based Firewall
- - Test External Services on the Linux-Based Firewall

***Unit: NSF (07) Network Security Fundamentals: Configuring a Virtual Private Network with OpenVPN***

Learning Objectives:

- - Install the Firewall and Configure the VPN Server
- - Configure the VPN Server and Clients
- - Use Internal Services from an External Machine

***Unit: NSF (05) Network Security Fundamentals: Configuring Access Control Lists on a Linux Based Firewall***

Learning Objectives:

- - Set up the network
- - Enable services and configure firewall rules
- - Test the firewall

***Unit: NSF (11) Network Security Fundamentals: Host-Based Firewalls***

Learning Objectives:

- - Understand when a hacker enters the network
- - Write rules to protect the network
- - Understand when a hacker triggers alerts

***Unit: NSF (06) Network Security Fundamentals: Configuring a Virtual Private Network with PPTP***

Learning Objectives:

- - Test the Firewall and Configure the VPN Server
- - Configure the VPN client
- - Use Internal Services from an External Machine



***Unit: NSF (08) Network Security Fundamentals: Implementing RIP, RIPv2, and Securing RIP***

Learning Objectives:

- - Configure RIP Version 1
- - Configure RIP Version 2
- - Secure RIP

***Unit: NSF (09) Network Security Fundamentals: Intrusion Detection using Snort***

Learning Objectives:

- - Set Up the Sniffer
- - Detect Unwanted Incoming Traffic
- - Detect Unwanted Outgoing Traffic

***Unit: NSF (10) Network Security Fundamentals: Writing Custom Rules***

Learning Objectives:

- - Penetrate a network
- - Write rules to protect the network
- - Generate traffic trigger alerts.

***Unit: NSF (14) Network Security Fundamentals: Configuring a Site to Branch a Virtual Private Network***

Learning Objectives:

- - Set up the Branch Office Machines
- - Configure the Main Office VPN Server and the Branch Server
- - Access Resources on the Remote Network

**Networking Fundamentals*****Unit: NF (01) Networking Fundamentals: Configuring Port Redirection***

Learning Objectives:

- - Test a firewall from an external network.
- - Allow ICMP/ping in a firewall.
- - Configure port redirection on a firewall.

***Unit: NF (02) Networking Fundamentals: Implementing NAT and Allowing Remote Access***

Learning Objectives:

- - Configure NAT.
- - Use Wireshark to understand how NAT works.

- - Use remote desktop on a network.

***Unit: NF (03) Networking Fundamentals: IPv4 vs IPv6 – Calculating, Configuring, and Testing***

Learning Objectives:

- - Use decimal, binary, and hexadecimal conversions.
- - Apply and test IPv4 subnet addresses.
- - Apply and test IPv6 subnet addresses.

***Unit: NF (09) Networking Fundamentals: Network Security - Firewalls***

Learning Objectives:

- - Enable, view, and configure Windows Firewall using the Control Panel.
- - View and configure Windows Firewall with Advanced Security (WFAS) using Administrative Tools.
- - Enable a firewall on a Linux system and enable firewall rules.

***Unit: NF (13) Networking Fundamentals: TCP/IP Protocols – The Core Protocols***

Learning Objectives:

- - Use network utilities and protocols from the TCP/IP suite.
- - Use a network packet analyzer, Wireshark, to examine the ARP protocol.
- - Capture and analyze transport layer packets.

***Unit: NF (04) Networking Fundamentals: Network Management***

Learning Objectives:

- - Analyze CPU and network utilization with Performance Monitor.
- - Use the Event Viewer to view logs.
- - Manage patches and updates.

***Unit: NF (05) Networking Fundamentals: Business Continuity - Disaster Recovery***

Learning Objectives:

- - Create a data backup.
- - Restore data from a data backup.
- - Download a virus test file to test antivirus software.

***Unit: NF (06) Networking Fundamentals: Breaking WEP and WPA and Decrypting the Traffic***

Learning Objectives:

- - Decrypt wireless network traffic that uses WEP.
- - Decrypt wireless network traffic that uses WPA.

***Unit: NF (07) Networking Fundamentals: Closing Ports and Unnecessary Services***

Learning Objectives:

- - Scan networks for open ports and services.
- - Connecting to the open ports and services using Telnet and FTP.
- - Closing unnecessary ports and services.

***Unit: NF (08) Networking Fundamentals: Implementing Security Policies on Windows and Linux***

Learning Objectives:

- - Secure the Windows login process.
- - Audit login failures.
- - Secure Linux.

***Unit: NF (10) Networking Fundamentals: Network Troubleshooting***

Learning Objectives:

- - Use the problem-solving process to troubleshoot a suspected DNS issue using CLI utilities and resolve the issue.
- - Configure an operational DHCP scope of addresses.
- - Observe the effects of a deactivated DHCP scope and resolve the problem.

***Unit: NF (11) Networking Fundamentals: TCP/IP Utilities***

Learning Objectives:

- - Display computer, IP, DNS, and network connections information using the CLI.
- - Use commands to test network connectivity.
- - Observe the ARP process using Wireshark.

***Unit: NF (12) Networking Fundamentals: The OSI Model***

Learning Objectives:

- - Explain the application, presentation, and session layers.
- - Explain the transport layer.
- - Explain the network layer.
- - Explain the data link layer.
- - Explain the physical layer.

***Unit: NF (14) Networking Fundamentals: TCP/IP Protocols – Other Key Protocols***

Learning Objectives:

- - Create and test a DHCP scope.
- - Create and test a DHCP reservation.

- - Create and test DNS records.

#### ***Unit: NF (15) Networking Fundamentals: Types of Networks***

Learning Objectives:

- - Create a shared file.
- - Testing the share and reassigning permissions.
- - Map a drive to a server.
- - Share and install a printer.
- - Accessing a web and FTP server.

#### ***Unit: NF (16) Networking Fundamentals: Remote Access - RDP***

Learning Objectives:

- - Connect to another machine using RDP.
- - Configure the Routing and Remote Access (RRAS) server role.
- - Use the built-in VPN client to create a VPN connection.

### **PC Maintenance and Repair**

#### ***Unit: PCMR (01) PC Maintenance and Repair: Examining PC Hardware***

Learning Objectives:

- - Use built-in Windows utilities to examine computer system hardware.
- - Examine the BIOS configuration using the CMOS utility.
- - Use a third-party software utility to examine computer system hardware.

#### ***Unit: PCMR (02) PC Maintenance and Repair: PC Operating Systems***

Learning Objectives:

- - Work with Microsoft Management Console.
- - Perform disk management.
- - Use Task Manager.
- - Use Regedit.

#### ***Unit: PCMR (03) PC Maintenance and Repair: Networking Essentials***

Learning Objectives:

- - Configure Windows clients to connect to a workgroup network.
- - Test network connectivity between computers.
- - Share data and resources on the network.
- - Use network command-line utilities.

***Unit: PCMR (08) PC Maintenance and Repair: Command Prompt Tools***

Learning Objectives:

- - Navigate the CLI.
- - Use some basic Windows CLI commands.

***Unit: PCMR (04) PC Maintenance and Repair: Printers***

Learning Objectives:

- - Install and share a printer.
- - Add the printer to a workgroup computer.

***Unit: PCMR (10) PC Maintenance and Repair: Control Panel***

Learning Objectives:

- - Configure power options through the Control Panel applet.
- - Configure Internet options through the Control Panel applet.
- - Configure personalization options through the Control Panel applet.
- - Configure Action Center and UAC settings.

***Unit: PCMR (05) PC Maintenance and Repair: Security Practices***

Learning Objectives:

- - Manage user accounts.
- - Create a local group policy.
- - Share folders and permissions.

***Unit: PCMR (06) PC Maintenance and Repair: Troubleshooting***

Learning Objectives:

- - Use System Configuration tool.
- - Manage processes with Task Manager.
- - Examine Event Viewer.

***Unit: PCMR (07) PC Maintenance and Repair: Disk Maintenance and Data Recovery***

Learning Objectives:

- - Maintain disks.
- - Backup data.
- - Recover data.

***Unit: PCMR (13) PC Maintenance and Repair: Data Backups in Windows, BSD, and Linux***

Learning Objectives:

- - Backup files in Windows.
- - Backup pfSense Firewall.
- - Backup files in Linux.

***Unit: PCMR (09) PC Maintenance and Repair: Remote Access***

Learning Objectives:

- - Configure remote desktop.
- - Configure remote assistance.

***Unit: PCMR (11) PC Maintenance and Repair: Desktop Customization***

Learning Objectives:

- - Examine the desktop customization features of Windows 7.
- - Set Folder Options.

***Unit: PCMR (12) PC Maintenance and Repair: Using Active Directory in the Enterprise***

Learning Objectives:

- - Create an Organizational Unit and Users in Active Directory
- - Set a Domain Level Policy in Active Directory
- - Set an Organizational Level Policy in Active Directory

***Unit: PCMR (14) PC Maintenance and Repair: Ubuntu Desktop Linux Installation***

Learning Objectives:

- - Install Ubuntu using a custom hard disk layout.
- - Make configuration changes to modify the Ubuntu GRUB 2 menu.

***Unit: PCMR (15) PC Maintenance and Repair: Domain Security***

Learning Objectives:

- - Join a domain.
- - Create a domain account.
- - Create a group policy.

**PC Maintenance and Repair - V2**

***Unit: PCMR2 (01) PC Maintenance and Repair - V2: Examining PC Hardware-v2***

Learning Objectives:

- - Use a third-party software utility to examine computer system hardware.
- - Examine the BIOS configuration using the CMOS utility.
- - Use built-in Windows utilities to examine computer system hardware.

***Unit: PCMR2 (02) PC Maintenance and Repair - V2: PC Operating Systems-v2***

Learning Objectives:

- - Work with Microsoft Management Console.
- - Perform disk management.
- - Use Regedit.
- - Use Task Manager.

***Unit: PCMR2 (03) PC Maintenance and Repair - V2: Networking Essentials-v2***

Learning Objectives:

- - Test network connectivity between computers.
- - Configure Windows clients to connect to a workgroup network.
- - Share data and resources on the network.
- - Use network command-line utilities.

***Unit: PCMR2 (04) PC Maintenance and Repair - V2: Printers-v2***

Learning Objectives:

- - Install and share a printer.
- - Add the printer to a workgroup computer.

***Unit: PCMR2 (05) PC Maintenance and Repair - V2: Security Practices-v2***

Learning Objectives:

- - Manage user accounts.
- - Create a local group policy.
- - Share folders and permissions.

***Unit: PCMR2 (06) PC Maintenance and Repair - V2: Troubleshooting-v2***

Learning Objectives:

- - Use System Configuration tool.
- - Examine Event Viewer.
- - Manage processes with Task Manager.

***Unit: PCMR2 (07) PC Maintenance and Repair - V2: Disk Maintenance and Data Recovery-v2***

Learning Objectives:

- - Recover data.
- - Backup data.
- - Maintain disks.

***Unit: PCMR2 (08) PC Maintenance and Repair - V2: Command Prompt Tools-v2***

Learning Objectives:

- - Navigate the CLI.
- - Use some basic Windows CLI commands.

***Unit: PCMR2 (09) PC Maintenance and Repair - V2: Remote Access-v2***

Learning Objectives:

- - Configure remote desktop.
- - Configure remote assistance.

***Unit: PCMR2 (10) PC Maintenance and Repair - V2: Control Panel-v2***

Learning Objectives:

- - Configure Action Center and UAC settings.
- - Configure power options through the Control Panel applet.
- - Configure personalization options through the Control Panel applet.
- - Configure Internet options through the Control Panel applet.

***Unit: PCMR2 (11) PC Maintenance and Repair - V2: Desktop Customization-v2***

Learning Objectives:

- - Examine the desktop customization features of Windows 7.
- - Set Folder Options.

***Unit: PCMR2 (12) PC Maintenance and Repair - V2: Using Active Directory in the Enterprise***

Learning Objectives:

- - Set an Organizational Level Policy in Active Directory
- - Set a Domain Level Policy in Active Directory
- - Create an Organizational Unit and Users in Active Directory

***Unit: PCMR2 (13) PC Maintenance and Repair - V2: Data Backups in Windows, BSD, and Linux***

Learning Objectives:

- - Backup files in Windows.
- - Backup files in Linux.
- - Backup pfSense Firewall.

***Unit: PCMR2 (14) PC Maintenance and Repair - V2: Domain Security***

Learning Objectives:

- - Join a domain.



- - Create a group policy.
- - Create a domain account.

### ***Unit: PCMR2 (15) PC Maintenance and Repair - V2: Ubuntu Desktop Linux Installation 18.04.1***

Learning Objectives:

- - Install Ubuntu using a custom hard disk layout
- - Install patches using a software updater
- - Upgrade to a new version of Ubuntu

## **Pointful Education**

### **Augmented and Virtual Reality**

#### ***Unit: AVR 00: Start Here***

Learning Objectives:

- - Completion

#### ***Unit: AVR 01: Introduction to Augmented and Virtual Reality***

Learning Objectives:

- - Define augmented reality (AR), virtual reality (VR), and mixed reality (MR)
- - Explain the difference between AR and VR
- - Predict and discuss whether AR or VR will be the more widely adopted technology
- - Describe the 3 primary components of a Heads Up Display (HUD)
- - Evaluate the historical contributors and contributions that have led to today's AR/VR systems

#### ***Unit: AVR 02: Augmented Reality Systems***

Learning Objectives:

- - Define key terms related to Augmented Reality (AR)
- - Differentiate between augmented reality modes on phones, headsets, and contact lenses
- - Examine technologies that allow AR to function, including motion tracking, mapping, light estimation, and software
- - Compare the 4 types of AR technology categories
- - Evaluate companies that make AR systems
- - Identify potential career opportunities within AR systems and educational paths to enter those careers

***Unit: AVR 03: Virtual Reality Systems - Introduction***

Learning Objectives:

- - Define key terms related to VR
- - Examine the hardware used in VR, including headsets, controllers, sensors, audio, sensory (haptics) and other components
- - Describe tracking and other technologies that make VR work
- - Describe categories of virtual reality based on levels of immersion, including computer-assisted virtual environments
- - Compare companies that make VR systems and distinguish between tethered and un-tethered systems
- - Identify potential career opportunities within VR systems and educational paths to enter those careers

***Unit: AVR 04: Augmented and Virtual Reality in Gaming***

Learning Objectives:

- - Define key terms related to AR/VR gaming
- - Evaluate features, genres, and types of AR gaming
- - Evaluate features, genres, and types of VR gaming
- - Predict when they will first use AV/VR in a gaming application
- - Determine the impact that AR/VR gaming will have on society
- - Discuss the pros and cons of AR/VR gaming
- - Identify potential career opportunities within AR/VR game development and educational paths to enter those careers

***Unit: AVR 05: Augmented and Virtual Reality in Education***

Learning Objectives:

- - Define key terms related to AR/VR in education
- - Evaluate applications of AR/VR in education in the classroom and in corporate training
- - Predict when they will first use AV/VR in school
- - Determine the impact that learning using AR/VR could have on educational outcomes
- - Discuss potential drawbacks and distractions that AR/VR could cause in education
- - Identify potential career opportunities within AR/VR in education and educational paths to enter those careers

***Unit: AVR 06: Augmented and Virtual Reality in Entertainment***

Learning Objectives:

- - Define key terms related to AR/VR in entertainment
- - Predict when they will first use AV/VR to watch a live event

- - Examine applications of AR/VR in entertainment, including sports applications, location-based entertainment, and cinematic virtual reality
- - Compare cinematic VR with traditional movies and TV and describe the changes in writing and production that cinematic VR will require
- - Discuss whether AR and VR devices isolate or connect people

#### ***Unit: AVR 07: Augmented and Virtual Reality in Healthcare***

Learning Objectives:

- - Define key terms related to AR/VR in healthcare
- - Evaluate uses of AR/VR in healthcare by patients
- - Describe how AR/VR are used to in therapy to overcome psychological issues
- - Examine the use of AR/VR systems by medical professionals
- - Determine the impact that AR/VR healthcare applications will have on society and jobs
- - Identify potential career opportunities within AR/VR in healthcare and educational paths to enter those careers

#### ***Unit: AVR 08: Augmented and Virtual Reality in Architecture, Engineering, and Construction***

Learning Objectives:

- - Define key terms related to AR/VR in architecture, engineering, and construction
- - Evaluate applications of AR/VR in architecture, real estate, engineering, and construction
- - Describe ways that AR/VR technology can improve safety and save money on construction projects
- - Evaluate companies that make virtual reality systems or solutions for the engineering and construction industries
- - Discuss potential risks from product liability of VR and AR devices
- - Identify potential career opportunities within AR/VR in engineering and educational paths to enter those careers

#### ***Unit: AVR 09: Augmented and Virtual Reality in Shopping***

Learning Objectives:

- - Define key terms related to AR/VR in shopping and retail
- - Predict when they will first use AV/VR while shopping
- - Evaluate applications of both AR and VR in shopping
- - Discuss the potential impact of AR/VR in shopping on jobs and the economy
- - Describe the pros and cons of marketing within AR/VR
- - Identify entrepreneurs within AR/VR in shopping and explain their ideas and contributions to this field

- - Research a startup company in the AR/VR shopping field and describe their product or service

#### *Unit: AVR 10: Social Virtual Reality and Telepresence*

Learning Objectives:

- - Define key terms related to AR/VR in telepresence and telerobotics
- - Evaluate telepresence, telerobotics, and social applications of AR/VR
- - Examine potential courtroom applications of AR/VR technology
- - Discuss and predict the long-term impact of AR/VR on brain functioning
- - Identify potential career opportunities within telerobotics/telepresence and educational paths to enter those careers

#### *Unit: AVR 11: Course Wrap-up/Final Exam*

Learning Objectives:

- - Completion

#### **Cloud Technologies and the Internet of Things**

##### *Unit: CLOUD 00: Start Here*

Learning Objectives:

- - Completion

##### *Unit: CLOUD 01: What is the Internet of Things?*

Learning Objectives:

- - Define Internet of Things (IoT), machine-to-machine, and “smart” machine
- - Identify key trends that are driving technological development: miniaturization, affordability, and de-wireization
- - Evaluate Moore’s law and Metcalf’s law and describe how they have contributed to the growth of connected machines
- - Recognize the number of connected devices globally and predict the growth of connected devices
- - Examine the impact that artificial intelligence, fog computing, and blockchain technology will have on the growth of IoT

##### *Unit: CLOUD 02: The Internet and the Cloud*

Learning Objectives:

- - Outline the history of the internet and the world wide web
- - Define cloud computing and fog computing and explain how they work

- - Identify key contributors to internet and cloud computing technology
- - Differentiate between the internet and the internet of things
- - Describe the technology adoption curve and examine examples of adoption such as the internet and mobile phones
- - Discuss the impact the internet has had on industries such as mail delivery and bookstores

#### ***Unit: CLOUD 04: Internet of Things and People***

##### Learning Objectives:

- - Define wearable technology and describe how wearable technology relates to the internet of things
- - List and describe key sensors used in various wearable applications
- - Describe applications of wearable technology across fitness & sports and business
- - Examine the potential risks of utilizing wearable technologies
- - Evaluate how wearable technology can contribute to digital distraction and what students can do to increase focus and attention
- - Identify career opportunities in wearable technologies and educational paths to enter those careers

#### ***Unit: CLOUD 03: Internet of Things at Home***

##### Learning Objectives:

- - Define key terms related to IoT applications in the home
- - Describe use cases of the Internet of Things within a house
- - Evaluate how the use of IoT in home systems such as heating, cooling, and sprinklers can improve resource efficiency and reduce maintenance problems
- - Discuss the benefits and drawbacks of relying on connected devices within the home
- - Evaluate the challenges of reliability on connected devices that may malfunction, run out of batteries, or be hacked

#### ***Unit: CLOUD 05: The Industrial Internet of Things***

##### Learning Objectives:

- - Define key terms related to the Industrial IoT
- - Examine companies and projects that are utilizing the Industrial IoT
- - Discuss how IoT technologies will enable Factories to become more efficient
- - Identify the risks associated with ransomware attacks on the IoT
- - Identify career opportunities in the industrial internet of things and educational paths to enter those careers

***Unit: CLOUD 06: Internet of Things in Healthcare***

## Learning Objectives:

- - Define key terms related to Healthcare IoT
- - Describe use cases of the Internet of Things in healthcare, including: blood pressure monitors, blood sugar monitors, in-home medication dispensers
- - Examine how IoT technology can be used track and monitor contagious diseases
- - Evaluate key risks associated with the IoT and connected devices
- - Discuss the importance of data collection in healthcare and describe how IoT devices collect and process data
- - Identify career opportunities in the IoT at Healthcare industry and educational paths to enter those careers

***Unit: CLOUD 07: Internet of Things and Cars***

## Learning Objectives:

- - Describe applications of the Internet of Things in cars, including tire pressure monitoring, connected cars, and driverless car sensors
- - Identify key technologies that enable self-driving cars (Lidar, radar, other sensors)
- - Define algorithm and explain how algorithms allow self-driving cars to operate
- - Compare the benefits and limitations of utilizing sensors and artificial intelligence in transportation
- - Determine the impact of robots on jobs in transportation
- - Identify career opportunities in self-driving cars and educational paths to enter those careers

***Unit: CLOUD 08: Internet of Things at the Store***

## Learning Objectives:

- - Define key terms related to IoT applications in retail
- - Describe use cases of the Internet of Things in stores
- - Examine how the IoT will impact the supply chain of how products are delivered
- - Identify and discuss risks, including privacy and security, with the use of IoT in stores
- - Discuss the impact of IoT on jobs in retail and the environment
- - Identify career opportunities in IoT Retail and educational paths to enter those careers

***Unit: CLOUD 09: Internet of Things and Farming***

## Learning Objectives:

- - Define key terms related to IoT applications in agriculture
- - Describe the change in agriculture employment from 1900 to today and the causes of the change

- - Describe use cases of the Internet of Things in farming
- - Discuss the challenges of feeding a growing global population and how improvements from IoT can help with this challenge
- - Examine how the use of IoT applications in agriculture could produce environmental benefits
- - Identify career opportunities in Agricultural technology and educational paths to enter those careers

#### ***Unit: CLOUD 10: Internet of Things and Cities***

Learning Objectives:

- - Define key terms related to IoT applications in cities
- - Describe use cases of the Internet of Things within cities
- - Evaluate the impact of smart cities on public sector jobs
- - Discuss the potential for smart cities to impact the environment positively or negatively
- - Examine efforts by companies and governments to address risks and concerns of the Internet of Things
- - Identify career opportunities in the IoT and Cities industry and educational paths to enter those careers

#### ***Unit: CLOUD 11: Course Wrap-up/Final Exam***

Learning Objectives:

- - Completion

#### **Cybersecurity**

##### ***Unit: Cyber 00: Module 0***

Learning Objectives:

- - Completion

##### ***Unit: Cyber 01: Introduction to Cybersecurity***

Learning Objectives:

- - Explain the various elements that make up the security taxonomy used by the U.S. Computer Emergency Readiness Team (CERT) and describe the challenges associated with achieving and maintaining computer security.
- - Discuss the range of potential consequences of various forms of security breaches and describe various defense mechanisms, techniques, and methodologies.
- - Compare and contrast mechanisms employed in passive and active cyber-attacks and describe the difference between an inside and an outside attack.

- - Describe vulnerabilities associated with each element of the CIA Triad and explain the differences between hardware, software, data, and network assets susceptible to cyber-attack.
- - Describe the tools and technologies used in cybersecurity and define intrusion detection and discuss its role in cybersecurity.
- - Explain what is meant by the term countermeasures and describe the role recovery plays in cybersecurity.

#### *Unit: Cyber 02: The Basics of Cybersecurity Part I*

##### Learning Objectives:

- - Describe the basic categories of vulnerabilities associated with cybersecurity (i.e., hardware, software, network, human, physical, and organizational) and how social networks such as Facebook are cybersecurity targets.
- - Describe footprinting and explain how it is used to reveal system vulnerabilities and explain why default values and technical controls are points of vulnerability and describe the hardening efforts being taken by government and industry.
- - Describe the process of port scanning and explain why it is so prevalent in cybersecurity.
- - Describe what is meant by password strength and explain its relationship to vulnerability, distinguish between a weak and a strong password and describe how intruders can cover their tracks.
- - Describe the circumstances under which a computer system is vulnerable to a denial-of-service attack and spoofing as an attack mechanism and discuss its consequences and common motivating factors for its use.
- - Describe the introduction of malware, spyware, and grayware as an attack mechanism and discuss its consequences and common motivating factors for its use.
- - Describe the use of computer viruses or worms and Logic Bombs as an attack mechanism and discuss its consequences and common motivating factors for its use.
- - Describe botnet, rootkit, and Trojan Horse as an attack mechanism and discuss its consequences and common motivating factors for its use.

#### *Unit: Cyber 09: Course Wrap-up/Final Exam*

##### Learning Objectives:

- - Completion

#### *Unit: Cyber 03: The Basics of Cybersecurity Part II*

##### Learning Objectives:



- - Describe DNS poisoning as an attack mechanism and discuss its consequences and common motivating factors for its use as well as buffer overflow as an attack mechanism and discuss its consequences and common motivating factors for its use.
- - Describe wired/media-agnostic network attacks including but not limited to Man-in-the-middle/Arp spoofing, and DHCP.
- - Examine safe wireless configuration options and dealing with wireless issues as an added attack surface.
- - Describe Cryptographic Algorithms including Hashing Functions, Symmetric Keys, Asymmetric Keys, and Kerberos.
- - Describe steganographic techniques including network steganographic methods (e.g., VOIP, WLAN), digital steganographic methods (e.g., image encryption, audio, mimic functions, video, packet manipulation), and steganographic techniques.
- - Understand how cryptography and digital signatures address security concepts including confidentiality, integrity, authentication, non-repudiation, and access control.
- - Define PKI (Public Key Infrastructure) including certificates (e.g., policies, practice statements), revocation, and trust models.

#### ***Unit: Cyber 04: Intrusion and Intrusion Detection Systems Part I***

##### Learning Objectives:

- - Describe the role of a Certificate Authority (CA) as well as Registration Authority (RA) and its relevance to security certificates.
- - Describe the events that make up the lifecycle of a certificate and how root certificate distribution works.
- - Compare and contrast SSL/TSL X.509-compliant certificates with PGP-compliant certificates.
- - Define intrusion and describe the classes of intruders (i.e., masquerader, misfeasor, clandestine user).
- - Describe what is meant by a hacker and discuss their role in cybersecurity as well as compare and contrast the “black hat” and “white hat” hacker cultures (i.e., computer criminal versus computer security expert).
- - Describe intrusion and user behavior, the three logical components that comprise an IDS (i.e., sensors, analyzers, user interface), and describe the essential requirements for any IDS.
- - Describe anomaly detection, specifically threshold and profile-based approaches as well as the types of audit records employed in intrusion detection (i.e., native, detection-specific).

#### ***Unit: Cyber 05: Intrusion and Intrusion Detection Systems Part II***

##### Learning Objectives:

- - Describe signature detection, specifically rule-based anomaly, and penetration identification approaches.
- - Describe the primary approach for network-based intrusion detection.
- - Compare and contrast inline and passive sensors and discuss typical placement of sensors in a network-based IDS environment as well as describe the operation, typical activities, and outputs of an intrusion detection system.
- - Describe some of the limitations of intrusion detection systems and differentiate between an intrusion detection system (passive) and an intrusion prevention (reactive) system.
- - Compare and contrast several of the intrusion detection systems available on the current market.

#### ***Unit: Cyber 06: Intrusion Prevention***

##### Learning Objectives:

- - Describe the process of monitoring/detecting port scanning attacks and associated patterns and explain how the monitoring and analysis of network traffic can be used to detect intrusion.
- - Describe the purpose and limitations of firewalls and the four types of firewalls (i.e., packet filtering, stateful inspection, application-level gateway, circuit-level gateway) as well as VLAN and other basic network isolation techniques.
- - Describe the use of honeypots as an intrusion prevention technique and explain how security policies are used to prevent intruders.
- - Explain how Access Control Lists (ACLs) are used to prevent intrusion and describe the limitations of traffic monitoring within virtual networks.
- - Discuss the primary vulnerability of virtual operating systems and describe the “hypervisor” and explain its role in securing a virtual environment.

#### ***Unit: Cyber 07: Social Engineering and Fundamental Security Design Principles***

##### Learning Objectives:

- - Define social engineering and describe its role in cybersecurity and discuss common mechanisms that constitute social engineering (e.g., phishing, baiting, quid pro quo, pretexting)
- - Describe the variety of attacks targeting the human element and countermeasures that can be used to counter social engineering attacks as well as discuss the three overarching security design principles (i.e., only necessary, simple, ease of use).
- - Describe the following principles; principle of least privilege as it relates to computer security, principle of separation of duties as it relates to computer security, principle of defense-in-depth as it relates to computer security, principle of fail-secure or fail-safe as it relates to computer security, principle of economy of mechanism as it relates to

computer security, and principle of complete mediation as it relates to computer security.

- - Describe the following principles; principle of open design as it relates to computer security, principle of least common mechanism as it relates to computer security, principle of psychological acceptability as it relates to computer security, principle of leveraging existing components as it relates to computer security, principle of weakest link as it relates to computer security, and principle of a single point of failure as it relates to computer security.

#### ***Unit: Cyber 08: Careers in Cybersecurity***

Learning Objectives:

- - Describe personal and jobsite safety rules and regulations that maintain safe and healthy work environments.
- - Explain emergency procedures to follow in response to workplace accidents.
- - Understand Hats and Teams terminology as it relates to careers in cybersecurity.
- - Explain Blue Team – day-to-day defensive security and DFIR – Blue Team’s First Responders as it relates to careers in cybersecurity.
- - Understand Penetration Testing – hacking for security as it relates to careers in cybersecurity.
- - Compare and contrast social engineering, creating a good security policy as it relates to careers in cybersecurity.

#### **Introduction to Artificial Intelligence**

##### ***Unit: IAI 00: Module 0: Start Here***

Learning Objectives:

- - Completion

##### ***Unit: IAI 01: Intro to Artificial Intelligence***

Learning Objectives:

- - Describe the history of artificial intelligence
- - Differentiate between robotics and artificial intelligence
- - Define keywords related to artificial intelligence
- - Examine the Turing test and theories of singularity
- - Outline the topics that will be covered throughout this course (algorithms, machine learning, deep learning, bias and ethics, applications, and AI’s impact on the future)

##### ***Unit: IAI 02: Perception and Intelligence***

Learning Objectives:

- - Describe how computers perceive the world using sensors and data
- - Differentiate between human intelligence and machine intelligence
- - Compare general vs. narrow artificial intelligence
- - Identify the limitations of machine perception
- - Evaluate the mechanics of how AI is used in picture/video recognition, and biometrics analysis

#### ***Unit: IAI 03: Algorithms In AI***

Learning Objectives:

- - Define algorithm and decision tree
- - Create a basic decision tree algorithm
- - Describe how algorithms form the basis of artificial intelligence
- - Provide examples of algorithms that students interact with daily
- - Evaluate how AI and algorithms are used in the field of astronomy to find exoplanets

#### ***Unit: IAI 04: Machine Learning***

Learning Objectives:

- - Define machine learning
- - Outline four drivers behind the emergence of machine learning 1) improvements in computing speed/memory, 2) transition from physically to electronically stored data, 3) easier access to data through the internet, 4) low-cost, high resolution digital sensors
- - Describe how training data is acquired and used
- - Compare supervised learning, unsupervised learning, and reinforcement learning
- - Evaluate the use of AI and machine learning to generate movie and music recommendations

#### ***Unit: IAI 05: Deep Learning & Neural Networks***

Learning Objectives:

- - Define deep learning
- - Explain the components of a neural network
- - Differentiate between deep learning and machine learning
- - Describe how deep learning will affect society and the economy
- - Evaluate how AI and deep learning is used to operate self-driving cars

#### ***Unit: IAI 06: Humans and AI***

Learning Objectives:

- - Describe the ways in which humans interact with AI through interfaces and robotics
- - Define design thinking and explain how it relates to AI

- - Outline ways that AI can be used for social good
- - Discuss the limitations of current AI technology
- - Evaluate the use of AI in personal assistants, chatbots, and language translators

#### *Unit: IAI 07: Ethical AI and Biases*

##### Learning Objectives:

- - Describe ethical challenges that AI presents and define what ethical criteria AI systems should be required to meet
- - Identify and outline areas where AI could be used in harmful ways such as mass surveillance and contribute to a loss of privacy
- - Discuss the cause and problems of biased AI systems
- - Describe how the lack of diversity in programming and AI jobs can impact and perpetuate bias
- - Evaluate the uses of AI in the U.S. criminal justice system in places like policing applications, and sentencing / parole decisions

#### *Unit: IAI 08: AI and Jobs*

##### Learning Objectives:

- - Compare the potential for both job destruction and job creation through AI
- - Describe how AI will impact all jobs across the economy and how people will work together with AI in future jobs
- - List the skills and educational requirements necessary to have a career in an AI field
- - Examine career possibilities in the field of Artificial Intelligence
- - Evaluate the use of AI in healthcare diagnostics and analyze the effects it will have on future jobs in healthcare

#### *Unit: IAI 09: Course Wrap-up / Final Exam*

##### Learning Objectives:

- - Completion

#### **Java SE8**

#### *Unit: Java SE8 03: Working With Java Data Types*

##### Learning Objectives:

- - Declare and initialize variables (including the casting of primitive data types)
- - Differentiate between object reference variables and primitive variables
- - Know how to read or write to object fields
- - Explain an Object's Lifecycle (creation, "dereference by reassignment" and garbage collection)

- - Develop code that uses wrapper classes such as Boolean, Double, and Integer

#### *Unit: Java SE8 02: Java Basics*

##### Learning Objectives:

- - Define the scope of variables.
- - Define the structure of a Java class.
- - Create executable Java applications with a main method; run a Java program from the command line; produce console output.
- - Import other Java packages to make them accessible in your code.
- - Compare and contrast the features and components of Java such as platform independence, object orientation, encapsulation, etc.

#### *Unit: Java SE8 06: Working with Methods and Encapsulation*

##### Learning Objectives:

- - Create methods with arguments and return values; including overloaded methods
- - Apply the static keyword to methods and fields
- - Create and overload constructors; differentiate between default and user-defined constructors
- - Apply access modifiers
- - Apply encapsulation principles to a class
- - Determine the effect upon object references and primitive values when they are passed into methods that change the values

#### *Unit: Java SE8 07: Working with Inheritance*

##### Learning Objectives:

- - Describe inheritance and its benefits
- - Develop code that makes use of polymorphism; develop code that overrides methods; differentiate between the type of a reference and the type of an object
- - Determine when casting is necessary
- - Use super and this to access objects and constructors
- - Use abstract classes and interfaces

#### *Unit: Java SE8 08: Handling Exceptions*

##### Learning Objectives:

- - Differentiate among checked exceptions, unchecked exceptions, and Errors
- - Create a try-catch block and determine how exceptions alter normal program flow
- - Describe the advantages of Exception handling
- - Create and invoke a method that throws an exception

- - Recognize common exception classes (such as NullPointerException, ArithmeticException, ArrayIndexOutOfBoundsException, ClassCastException)

***Unit: Java SE8 09: Working with Selected classes from the Java API***

Learning Objectives:

- - Create and manipulate Strings
- - Manipulate data using the StringBuilder class and its methods
- - Create and manipulate calendar data using classes from java.time.LocalDateTime, time.LocalDate, java.time.LocalTime, java.time.format.DateTimeFormatter, java.time.Period
- - Declare and use an ArrayList of a given type
- - Write a simple Lambda expression that consumes a Lambda Predicate expression

***Unit: Java SE8 10: Final Exam***

Learning Objectives:

- - Completion

***Unit: Java SE8 00: Start Here***

Learning Objectives:

- - Completion

***Unit: Java SE8 01: Introduction to Coding and Java***

Learning Objectives:

- - Learn how to think in code and find solutions to basic mathematical problems.
- - Understand algorithms and flowcharts.
- - Understand the basics of Java, including how to use compilers and interpreters, text editor, IDE, CLI, and GUI.
- - Write a basic Hello World program in Java and understand key Java terminology.

***Unit: Java SE8 05: Using Loop Constructs***

Learning Objectives:

- - Create and use while loops
- - Create and use for loops including the enhanced for loop
- - Create and use do/while loops
- - Compare loop constructs
- - Use break and continue

**Unit: Java SE8 04: Using Operators and Decision Constructs and Creating and Using Arrays**

Learning Objectives:

- - Use Java operators; use parentheses to override operator precedence
- - Test equality between Strings and other objects using == and equals ()
- - Create if and if/else and ternary constructs.
- - Use a switch statement
- - Declare, instantiate, initialize and use a one-dimensional array
- - Declare, instantiate, initialize and use multi-dimensional arrays

**Networking****Unit: NET 02: Network Components Part II**

Learning Objectives:

- - Configure and verify IPv4 addressing and subnetting and describe the need for private IPv4 addressing
- - Configure and verify IPv6 addressing and prefix and compare IPv6 address types including global unicast, unique local, link-local, anycast, multicast, and modified EUI 64.
- - Verify IP parameters for Client OS (Windows, Mac OS, Linux)
- - Describe wireless principles including nonoverlapping WIFI channels, SSID, RF, and encryption and explain virtualization fundamentals (virtual machines)
- - Describe switching concepts including MAC learning and aging, frame switching, frame flooding, and MAC address table

**Unit: NET 01: Network Components Part I**

Learning Objectives:

- - Explain the role and function of network components including routers, L2 and L3 switches, next-generation firewalls and IPS, access points, controllers, endpoints, and servers.
- - Describe characteristics of network topology architectures including 2 tier, 3tier, spine-leaf, WAN, SOHO, on-premises, and cloud.
- - Compare physical interface and cabling types including single-mode fiber, multimode fiber, copper, ethernet shared media, point-to-point, and PoE concepts.
- - Identify interface and cable issues (collisions, errors, mismatch duplex, and/or speed).
- - Compare TCP to UDP.

**Unit: NET 03: Network Access**

Learning Objectives:



- - Configure and verify VLANs (normal range) spanning multiple switches including access ports (data and voice), default VLAN, and connectivity.
- - Configure and verify interswitch connectivity including trunk ports, 802.1Q, and native VLAN.
- - Configure and verify Layer 2 discovery protocols (Cisco Discovery Protocol and LLDP)
- - Configure and verify (Layer 2/Layer 3) EtherChannel (LACP)
- - Describe the need for and basic operations of Rapid PVST+ Spanning Tree Protocol and identify basic operations including root port, primary and secondary root bridge, other port names, forwarding/blocking port states, and PortFast benefits.
- - Compare Cisco Wireless Architectures and AP modes
- - Describe physical infrastructure connections of WLAN components (AP, WLC, access/trunk ports, and LAG)
- - Describe AP and WLC management access connections (Telnet, SSH, HTTP, HTTPS, console, and TACACS+/RADIUS)
- - Configure the components of a wireless LAN access for client connectivity using GUI only such as WLAN creation, security settings, QoS profiles, and advanced WLAN settings.

#### *Unit: NET 00: Introduction to Networking and Careers*

Learning Objectives:

- - Completion

#### *Unit: NET 04: IP Connectivity*

Learning Objectives:

- - Interpret the components of a routing table including routing protocol code, prefix, network mask, next hop, administrative distance, metric, and gateway of last resort.
- - Determine how a router makes a forwarding decision by default including longest match, administrative distance, and routing protocol metric.
- - Configure and verify IPv4 and IPv6 static routing including a default route, network route, host route, and floating static.
- - Configure and verify single area OSPFv2 including neighbor adjacencies, point-to-point, broadcast (DR/BDR selection), and Router ID.
- - Describe the purpose of first hop redundancy protocol.

#### *Unit: NET 05: IP Services*

Learning Objectives:

- - Configure and verify inside source NAT using static and pools as well as NTP operating in a client and server mode.

- - Explain the role of DHCP and DNS within the network and the function of SNMP in network operations.
- - Describe the use of Syslog features including facilities and levels as well as configure and verify DHCP client and relay.
- - Explain the forwarding per-hop behavior (PHB) for QoS such as classification, marking, queuing, congestion, policing, shaping.
- - Configure network devices for remote access using SSH and describe the capabilities and function of TFTP/FTP in the network.

#### ***Unit: NET 06: Security Fundamentals***

##### Learning Objectives:

- - Define key security concepts (threats, vulnerabilities, exploits, and mitigation techniques) and describe security program elements (user awareness, training, and physical access control).
- - Configure device access control using local passwords and describe security password policies elements, such as management, complexity, and password alternatives (multifactor authentication, certificates, and biometrics).
- - Describe remote access and site-to-site VPNs and configure and verify access control lists.
- - Configure Layer 2 security features (DHCP snooping, dynamic ARP inspection, and port security) and differentiate authentication, authorization, and accounting concepts.
- - Describe wireless security protocols (WPA, WPA2, and WPA3) and configure WLAN using WPA2 PSK using the GUI.

#### ***Unit: NET 07: Automation and Programmability***

##### Learning Objectives:

- - Explain how automation impacts network management and compare traditional networks with controller-based networking.
- - Describe controller-based and software defined architectures (overlay, underlay, and fabric) including separation of control plane and data plane, north-bound, and southbound APIs and compare traditional campus device management with Cisco DNA Center enabled device management.
- - Describe characteristics of REST-based APIs (CRUD, HTTP verbs, and data encoding) and recognize the capabilities of configuration management mechanisms Puppet, Chef, and Ansible.
- - Interpret JSON encoded data.
- - Prepare for the Cisco Certified Network Associate (CCNA) exam.

#### ***Unit: NET 08: Final Exam***

##### Learning Objectives:

- - Completion

### Swift App Development

#### *Unit: Swift App Development 00*

No Learning Objectives available.

#### *Unit: Swift App Development 01: Planning, Design, and Theory*

Learning Objectives:

- - Summarize the steps of the design cycle, including brainstorming, planning, prototyping, and evaluation.
- - Summarize how sensitive data can be protected and compromised: Sharing personal and application information
- - Summarize how sensitive data can be protected and compromised: Security challenges.
- - Evaluate the legal, ethical, and socioeconomic impacts of compromised data.
- - Understand the application lifecycle in iOS.

#### *Unit: Swift App Development 02: Project Navigation*

Learning Objectives:

- - Differentiate between basic file types.
- - Recognize the assets available in a project.
- - Define how assets are used.
- - Import an asset to a project and use it correctly.
- - Select the appropriate actions to hide or show different areas of the user interface.

#### *Unit: Swift App Development 03: Interface Builder/iOS*

Learning Objectives:

- - Given a scenario, select the appropriate object(s) on the storyboard or the Document Outline
- - Use the Attributes inspector to non-programmatically modify the properties of objects and/or a view
- - Connect UIKit objects on the storyboard to a Swift file: Differentiate between an IBOutlet and an IBAction
- - Connect UIKit objects on the storyboard to a Swift file: Determine when to connect an object as an IBOutlet or an IBAction
- - Programmatically modify the properties of objects and/or a view

#### *Unit: Swift App Development 04: Functions, Operators, and Structures*

Learning Objectives:

- - Write, call and/or evaluate the execution of functions: Evaluate the use of argument labels, parameters and returns
- - Calculate the results when using various operators
- - Create and evaluate structures: Declare the properties of a structure
- - Create and evaluate structures: Initialize the properties of a structure
- - Create and evaluate structures: Define methods
- - Create and evaluate structures: Create an instance of a structure
- - Create and evaluate structures: Use an instance of a structure

#### *Unit: Swift App Development 05: Arrays*

##### Learning Objectives:

- - Create and manipulate arrays: Declare and/or initialize an array with values
- - Create and manipulate arrays: Identify and/or modify an array element using its index
- - Create and manipulate arrays: Use and/or evaluate array properties and/or methods
- - Demonstrate how to control the flow of execution: Create, analyze and predict loop structures and their results
- - Demonstrate how to control the flow of execution: Create and interpret the outcome of conditional statements

#### *Unit: Swift App Development 06: Enumerations and Naming Conventions*

##### Learning Objectives:

- - Create, use and/or compare custom enumerations.
- - Declare and/or evaluate constants and variables of different data types: Differentiate between constants and variables.
- - Declare and/or evaluate constants and variables of different data types: Apply type inference.
- - Declare and/or evaluate constants and variables of different data types: Use explicit typing.
- - Use the appropriate naming conventions: Use appropriate camel casing.
- - Use the appropriate naming conventions: Apply Swift identifier rules.

#### *Unit: Swift App Development 07: Debugging*

##### Learning Objectives:

- - Use the Connections inspector to evaluate whether a connection error has occurred.
- - Given a connection error scenario, determine a solution.
- - Differentiate between syntax and run-time errors when building and running an app.
- - Interpret console error messages.
- - Recognize the purpose of breakpoints.

***Unit: Swift App Development 08: Course Wrap-up/Final Exam***

No Learning Objectives available.

***Unit: Swift App Development 09: App Development Project***

No Learning Objectives available.

**WearTech: Wearable Technologies*****Unit: WearTech 01: Introduction to Wearable and Implantable Technologies***

Learning Objectives:

- - Define wearable technology and distinguish this from non-wearable technologies
- - Define implantable technology
- - Describe the history of wearable technologies
- - Identify key security and privacy challenges presented by wearable technology
- - Discuss whether wearable technology devices isolate or connect people

***Unit: WearTech 00: Module 00***

Learning Objectives:

- - Completion

***Unit: WearTech 02: Components of Wearables***

Learning Objectives:

- - Describe the key electronic components that make up nearly all wearables
- - Define Moore's law and describe how the reduction in the size of components has contributed to the rise in wearables
- - List and describe key sensors used in various wearable applications
- - Compare analog and digital sensors
- - Examine 3 points of vulnerability in wearable technologies

***Unit: WearTech 03: Batteries in Wearables***

Learning Objectives:

- - Describe efficiency and evaluate how technological improvements in other areas help extend battery life
- - Examine various battery technologies and describe their characteristics and limitations
- - Differentiate between liquid and solid-state batteries
- - Define wireless battery charging
- - Evaluate the past and current work of John Goodenough, who invented the lithium-ion battery

- - Discuss destructive mining from rare metals used in batteries

#### *Unit: WearTech 04: Product Design of Wearables*

##### Learning Objectives:

- - Describe an operating system and how it is used to integrate components
- - Distinguish between hardware and software
- - Evaluate key technologies that are part of wearable products, including Artificial intelligence, machine learning, and voice recognition
- - Describe the product development process of wearables
- - List design considerations that are unique to wearable products, such as durability, reliability safety, and consumer comfort
- - Identify potential career opportunities within wearable technology development

#### *Unit: WearTech 05: Wearable Technology in Healthcare*

##### Learning Objectives:

- - Define key terms related to wearable healthcare technology
- - Describe several applications of wearable technology in healthcare
- - Evaluate the use of wearable technologies by medical professionals
- - Discuss the benefits and potential risks of utilizing and relying on wearable technologies for healthcare monitoring and delivery of care
- - Identify potential career opportunities within wearable healthcare technologies

#### *Unit: WearTech 06: Wearable Technologies in Fitness and Sports*

##### Learning Objectives:

- - Define key terms related to wearable technology in fitness and sports
- - Describe applications of wearable technology in fitness and sports
- - Evaluate the smartwatch industry and describe various companies and products
- - Discuss the benefits and potential risks of utilizing wearable technologies for fitness and sports
- - Identify potential career opportunities within wearable fitness/sport technologies

#### *Unit: WearTech 07: Wearable Technology in Public Safety and the Military*

##### Learning Objectives:

- - Define key terms related to wearable technology in public safety and defense
- - Examine several applications of wearable technology by firefighters
- - Examine several applications of wearable technology by the military
- - Describe the developments and potential uses of exoskeleton technology by the military

- - Discuss the benefits and potential risks of having the military utilize wearable technologies
- - Evaluate the use of police body cameras in the U.S.

#### *Unit: WearTech 08: Wearable Technology in Fashion*

##### Learning Objectives:

- - Define key terms related to wearable technology in fashion
- - Describe the function of electronic textiles and smart clothing
- - Evaluate several applications of wearable technology in fashion and clothing
- - Discuss the factors that contribute to a wearable product's success or failure
- - Identify potential career opportunities within wearable fashion technologies

#### *Unit: WearTech 09: Wearable Technology in Education*

##### Learning Objectives:

- - Define key terms related to wearable technology in education
- - Describe current and potential applications of wearable technology in education for both students and teachers
- - Evaluate the smartwatch industry and describe various companies and products
- - Discuss the potential risks and downsides of utilizing wearable technologies for education, such as technical problems, high cost, and cheating
- - Examine how wearable technology and AR/VR can contribute to digital distraction and what students can do to increase focus and attention

#### *Unit: WearTech 10: Wearable Technology in Business*

##### Learning Objectives:

- - Define key terms related to wearable technology in business
- - Describe applications of wearable technology in the workforce to improve safety and productivity
- - Discuss the benefits and potential risks of utilizing wearable technologies for business
- - Discuss standards companies should follow to improve the security and privacy of users
- - Identify potential career opportunities within wearable technologies for business

#### *Unit: WearTech 11: Course Wrap-up/Final Exam*

##### Learning Objectives:

- - Completion

## Law, Public Safety, Corrections & Security

### ATSVR

#### ATSVR

***Unit: VR-01 New User Tutorial***

No Learning Objectives available.

***Unit: VR-02 Triage Tutorial***

No Learning Objectives available.

***Unit: VR-03 Active Shooter Mass Casualty Event: Hospital Emergency Preparedness - Beginner***

No Learning Objectives available.

***Unit: VR-04 Active Shooter Mass Casualty Event: Hospital Emergency Preparedness - Intermediate***

No Learning Objectives available.

***Unit: VR-05 Active Shooter Mass Casualty Event: Hospital Emergency Preparedness - Advance***

No Learning Objectives available.

***Unit: VR-06 Mass Casualty Event Reunification Protocol - Beginner***

No Learning Objectives available.

***Unit: VR-07 Mass Casualty Event Reunification Protocol - Intermediate***

No Learning Objectives available.

***Unit: VR-08 Mass Casualty Event Reunification Protocol - Advance***

No Learning Objectives available.

***Unit: VR-09 Vehicle and Machine Training - Explore***

No Learning Objectives available.

***Unit: VR-10 Vehicle and Machine Training - Beginner***

No Learning Objectives available.

***Unit: VR-11 Vehicle and Machine Training - Intermediate***

No Learning Objectives available.

***Unit: VR-12 Vehicle and Machine Training - Advance***

No Learning Objectives available.



## Certify ED

### Criminal Justice (Video & VR)

#### *Unit: Criminal Justice - The Constitutional Framework of Criminal Justice*

##### Learning Objectives:

- - Describe how the three branches of government work in conjunction to support our criminal justice system.
- - Identify constitutional law as it applies to the criminal justice system.
- - Describe and demonstrate search and Seizure as it relates to *Miranda v. Arizona*.
- - Describe and demonstrate stop and frisk as it relates to *Terry v. Ohio*.
- - Explain how the Bill of Rights governs police and prosecutors.
- - Evaluate how the 6th Amendment impacts both criminal investigations and the trial process.
- - Evaluate the impact of the 8th amendment on our judicial system.
- - Explain how the 14th Amendment enhanced citizen protection under due process.

#### *Unit: Criminal Justice - Criminal Procedure: From Arrest to Prosecution*

##### Learning Objectives:

- - Describe arrest procedures including probable cause and reasonable suspicion.
- - Describe how to complete an arrest report.
- - How to complete correct arrest, place handcuffs, complete a search, and complete an arrest report.
- - Define the classes of crimes.
- - Define types and categories of misdemeanors crimes and infractions.
- - Define types and categories of felony crimes.
- - Differentiate between, and identify elements of, civil and criminal law.
- - Describe federal criminal law procedures.
- - Describe state criminal law procedures.
- - Discuss the impact local ordinances can have on criminal procedures.

#### *Unit: Criminal Justice - Federal Courts and the Criminal Justice Process*

##### Learning Objectives:

- - Describe the federal court system as it applies to the criminal justice system.
- - Describe the roles and responsibilities of the people involved in the trial processes.
- - Describe appropriate professional courtroom testimony and demeanor.
- - Explain how to notify witnesses and defendants of court schedules.
- - Describe the warrant and summons processes.
- - Describe the difference between a search warrant and an arrest warrant.

- - Identify the programs and agencies within the juvenile justice system and their roles and responsibilities.
- - Identify law enforcement procedures related to juvenile delinquency.

#### *Unit: Criminal Justice - Patrol Procedures and Techniques*

##### Learning Objectives:

- - Demonstrate proper communication usage and procedures (i.e. use the telephone and police radio properly).
- - Demonstrate correctly conducting a low-risk traffic stop, including reporting to dispatch, and issue a traffic citation.
- - Describe proper traffic stop techniques.
- - Demonstrate proper handcuffing techniques.
- - Identify appropriate search procedures in the inspection of a vehicle and equipment.
- - Identify appropriate search procedures for persons.
- - Identify the main duties and responsibilities of patrol officers.
- - Identify different types of patrol procedures and techniques.
- - Identify different patrol types and zones and evaluate the advantages and disadvantages of each.

#### *Unit: Criminal Justice - Unit Sim*

##### Learning Objectives:

- - Demonstrate visual memory
- - Investigate a crime scene
- - Understand different techniques used in properly collecting and storing evidence

#### *Unit: Criminal Justice - Criminal Investigations: Techniques and Procedures*

##### Learning Objectives:

- - Identify the different types of criminal investigations (juvenile, robbery).
- - Describe effective interview skills and techniques for obtaining information from witnesses and victims in an investigation.
- - Describe effective interview skills and techniques for obtaining information from suspects in an investigation.
- - Describe Miranda warning requirements in suspect interviews.
- - Describe fingerprint processing, including live scan and inked impressions.
- - Describe scene safety techniques for officer response (e.g., domestic abuse, assault).
- - Describe scene safety techniques for officer response at a motor vehicle crash site.
- - Recognize and describe indicators of impaired drivers.
- - Describe the purpose of different types of reports.

***Unit: Criminal Justice - Use of Force: Principles, Practices, and Legal Implications***

## Learning Objectives:

- - Describe the use-of-force guidelines as it applies to Federal, State, and local laws.
- - Explain the proper de-escalation techniques used by police officers.
- - Identify non-lethal weapons and techniques for use in the field.
- - Describe the differences between less-than-lethal force and deadly force.
- - Identify the procedural laws and requirements governing the use of deadly force.
- - Explain the civil and criminal liabilities that apply to use of force by a police office.
- - Describe legal issues pertaining to objective reasonableness as it pertains to the use of force that include Tennessee v. Garner and Graham v. Conner cases.
- - Demonstrate weapon safety and familiarization.
- - Identify the unique interpersonal skills required in communicating with a culturally diverse community.

***Unit: Criminal Justice - Human Relations and Community Policing in Criminal Justice***

## Learning Objectives:

- - Identify factors that may affect human relations in criminal justice operations with culturally diverse communities.
- - Identify methods of communication that may enhance human relations with culturally diverse communities.
- - Describe procedures for identifying, handling, and referring people who exhibit signs of mental illness.
- - Identify and describe procedures for dealing with domestic violence, including abuse and neglect.
- - Identify racial profiling as it relates to policing.
- - Identify solutions for situations that require crisis management and conflict resolution (e.g., language interpreters, victims of domestic violence, homeless persons, disaster response).
- - Describe the purpose of different types of reports and field notes.
- - Explain the who-what-when-where-why-how elements of accurate report writing and field notes.
- - Analyze current trends in effective community-oriented policing.

***Unit: Criminal Justice - Law Enforcement Technology and Emerging Threats***

## Learning Objectives:

- - Display familiarity with law enforcement computer databases (i.e. National Crime Information Center (NCIC)).
- - Identify emerging police technology and social media.

- - Identify sources and types of domestic and international terrorism.
- - Describe safe and responsible ways of responding to expressions of hostility or threats, including the use of private security and property protection.
- - Identify different types of criminal organizations.

***Unit: Criminal Justice - Crime Scene Safety and Hazardous Materials Management***

Learning Objectives:

- - Discuss the potential health and safety hazards one could encounter at a crime scene.
- - Demonstrate skills and techniques to minimize risk to self and others at the crime scene.
- - Discuss state and federal regulations regarding hazardous materials as related to crime scenes.
- - Identify hazardous materials, proper response, and scene management.
- - Discuss emergency procedures involving personal risk in a crime scene situation.
- - Demonstrate knowledge of CPR, AED, First aid, and emergency medical care.
- - Identify and explain the use of protective equipment for crime scene processing.
- - Identify proper methods for marking, measuring, and collecting evidence.
- - Explain the scientific principles involved in proper evidence preservation.
- - Identify and follow chain of custody protocols.

***Unit: Criminal Justice - Crime Scene Investigation and the Juvenile Justice System***

Learning Objectives:

- - Identify and explain the appropriate crime scene management for a first responder.
- - Identify and explain the appropriate search patterns that are used to identify evidence at a crime scene.
- - Explain the methods for collecting and processing latent fingerprints.
- - Explain the methods for collecting DNA evidence.
- - Explain proper crime scene photography and documenting photographs taken at the scene.
- - Discuss juvenile court system, including procedures and alternative programs.
- - Describe the history of corrections.
- - Identify correctional system intake procedures.
- - Differentiate between local, state, and federal correctional systems.
- - Identify various types of correctional systems security levels, and classifications of correctional institutions.

## Open Textbooks

### CRIMJ01: 01: Criminal Justice 100

#### *Unit: Criminal Justice 100*

##### Learning Objectives:

- - Define the two key models of crime control in the United States, the Consensus Model and the Conflict Model, and differentiate between their underlying principles and assumptions.
- - Identify and explain the major tenets of Classical Criminology and Positivism as well as understand the key figures associated with these theories, such as Cesare Beccaria and Cesare Lombroso.
- - Explain the evolution of policing from early methods used for controlling certain populations, such as slaves, to the establishment of the first formal police departments, and understand how the patronage system influenced early police recruitment.
- - Describe the responsibilities and training requirements for different law enforcement positions, such as U.S. Marshals and FBI Agents, and analyze the key federal law enforcement agencies under the Department of Justice.
- - Demonstrate the ability to summarize the key elements of Supreme Court cases, including the facts, constitutional issues, decisions, reasoning, separate opinions, and the impact of the case on future generations.
- - Outline the sequential steps involved, including arrest, booking, initial appearance, grand jury, preliminary hearing, indictment, arraignment, plea bargain, trial, and sentencing, and understand the role of bail, pretrial release, and preventive detention in the process.
- - Explain the various reasons why society punishes criminals, including concepts like retribution, deterrence, incapacitation, rehabilitation, and restorative justice.
- - Describe the different models and structures of sentencing within the correctional system, such as indeterminate sentencing, determinate sentencing, good time, and truth-in-sentencing.

## Criminal Justice

#### *Unit: CRIMJ02: 01: I. Corrections*

##### Learning Objectives:

- - Describe the historical evolution of jails in the United States, from their origins in feudal England to their role as integral components of local criminal justice systems today.

- - Understand the diverse population served by jails, including men, women, children, and individuals with mental illness or substance abuse issues. They should also be able to explain the two primary functions of jails: intake and custody.
- - Outline the historical development of prisons in the United States, from the early penitentiary movement to the emergence of various correctional models, such as rehabilitation, crime control, and community corrections.
- - Understand the classification and security levels within prisons, including super-maximum, maximum, medium, and minimum-security facilities.
- - Identify the constitutional rights retained by prisoners in the United States, including the right to free speech, freedom of religion, access to the courts, freedom from retaliation, and protection from cruel and unusual punishment.
- - Understand the significance of landmark Supreme Court cases, such as *Wolff v. McDonnell* and *Estelle v. Gamble*, in defining prisoners' due process rights and protections.
- - Understand the purpose of parole and probation as community-based sanctions aimed at reintegrating offenders into society as productive members while ensuring community safety.
- - Recognize the cost-effective nature of community-based sanctions compared to incarceration and the need for alternative sentencing options for nonviolent offenders.
- - Comprehend the due process rights afforded to probationers and parolees, including the requirement for written notice of violations, disclosure of evidence, hearings, confrontation of adverse witnesses, a neutral hearing body, and a written statement of evidence and reasons for revocation.
- - Examine the constitutional limitations on probation and parole conditions, including the need for clarity, reasonableness, and a direct relationship to protection and rehabilitation goals, while also considering fundamental rights when imposing conditions.

***Unit: CRIMJ02: 02: II. Criminal Justice Systems and Processes***

**Learning Objectives:**

- - Understand the distinction between deviance and crime and explain why crime is punishable under official law.
- - Differentiate between violent and nonviolent crimes and provide examples of each.
- - Define hate crimes and explain their historical context in the United States.
- - Analyze the prevalence and impact of hate crimes, including their underreporting and specific targets.
- - Compare and contrast the Uniform Crime Reports (UCR) and the National Crime Victimization Report (NCVR) in gathering crime data.
- - Evaluate the factors influencing public perception of crime rates and their potential consequences.

- - Describe the three branches of the U.S. criminal justice system (police, courts, and corrections) and their respective roles.
- - Explain the hierarchy of the U.S. court system, including federal and state courts, and the powers of each branch of government within the system.
- - Define dual federalism and explain the theoretical relationship between state and federal governments.
- - Discuss the concept of federal supremacy and its impact on state laws in cases of conflict.
- - Outline the structure of the U.S. court system, including federal and state courts, and their respective roles.
- - Explore the responsibilities and powers of Congress in relation to federal courts, including budget control.
- - Explain the supremacy clause and its implications for conflicts between federal and state laws.
- - Analyze the interplay between state, federal, and local governments in the criminal justice system and their roles in law enforcement and legislation.

**Unit: CRIMJ02: 03: III. Research Methods & Theories of behavior/punishment**

**Learning Objectives:**

- - Understand the importance of the scientific method in sociological research, including its systematic approach, key steps, and its role in ensuring objectivity, accuracy, reliability, and validity in studying human behavior.
- - Differentiate between the scientific method and an interpretive framework in sociological research, recognizing that while both approaches provide valuable insights, they have distinct methodologies and goals in studying social phenomena.
- - Understand the importance of research methods in sociology and their role in designing and conducting sociological studies.
- - Identify and differentiate between the four widely used methods of social investigation in sociology: surveys, field research, experiments, and secondary data analysis, and recognize their strengths and limitations in various research contexts.
- - Understand the ethical responsibilities of sociologists in conducting research, including ensuring the safety of participants, obtaining informed consent, and protecting privacy, as outlined by the American Sociological Association's code of ethics
- - Recognize the concept of value neutrality in sociological research and its importance in maintaining objectivity, including the obligation to report research findings accurately, even when they conflict with personal beliefs or widely accepted beliefs
- - Define and differentiate between various categories of crimes, including felonies, misdemeanors, and violations, and understand the historical origins of this classification in the legal system

- - Explain the significance of crime measurement and its role in law enforcement and criminal justice, including the use of crime statistics from sources such as the FBI's Uniform Crime Reports (UCR) and the National Crime Victimization Survey (NCVS), while recognizing the limitations of these data sources

*Unit: CRIMJ02: 04: IV. Justice and the Law*

Learning Objectives:

- - Define a crime
- - Compare criminal law and criminal procedure
- - Compare civil and criminal law.
- - Ascertain the primary differences between civil litigation and a criminal prosecution.
- - Ascertain the basis for grading.
- - Compare malum in se and malum prohibitum crimes.
- - Compare the punishment options for felonies, misdemeanors, felony-misdemeanors, and infractions.
- - Compare jail and prison.
- - Identify the three sources of law.
- - Rank the three sources of law, from highest to lowest.
- - Ascertain the purpose of the US and state constitutions.
- - Ascertain one purpose of statutory law.
- - Ascertain the purpose of case law.
- - Define judicial review.
- - Diagram and explain the components of a case brief.
- - Define civil liberties and civil rights
- - Describe the origin of civil liberties in the U.S. context
- - Identify the key positions on civil liberties taken at the Constitutional Convention
- - Explain the Civil War origin of concern that the states should respect civil liberties
- - Identify the liberties and rights guaranteed by the first four amendments to the Constitution
- - Explain why in practice these rights and liberties are limited
- - Explain why interpreting some amendments has been controversial
- - Identify the rights of those suspected or accused of criminal activity
- - Explain how Supreme Court decisions transformed the rights of the accused
- - Explain why the Eighth Amendment is controversial regarding capital punishment
- - Describe how the Ninth and Tenth Amendments reflect on our other rights
- - Identify the two senses of "right to privacy" embodied in the Constitution
- - Explain the controversy over privacy when applied to abortion and same-sex relationships



**Unit: CRIMJ02: 05: V. Policing**

## Learning Objectives:

- - Describe the historical origins of policing in the United States, tracing its roots back to the common law of England and its early development in colonial America, highlighting the roles of sheriffs and the transition from reactive to proactive policing
- - Explain the challenges and reforms in early policing, including issues of political influence, corruption, and the transition to the reform era, emphasizing the contributions of police reformers like August Vollmer and O.W. Wilson in shaping modern policing practices
- - Explain the multifaceted role of police officers in society beyond the popularized "crime fighter" image, emphasizing their responsibilities in addressing social service, order maintenance, and other non-law enforcement tasks
- - Describe the diverse structure of policing in the United States, including the roles and responsibilities of federal law enforcement agencies, state law enforcement agencies, sheriffs' offices, and local police departments, while also discussing key management styles and the quasi-military features of police organizations
- - Describe the historical evolution of police methods in the United States, including the transition from traditional patrol and investigative work to proactive policing strategies, highlighting key research findings that led to this shift
- - Explain the concept of proactive policing, including the shift from random preventive patrol to targeted strategies, such as problem-oriented policing and community-oriented policing, and the importance of partnerships, organizational change, and line officer buy-in in implementing these approaches
- - Identify the primary responsibilities of criminal investigators, including their roles in gathering information, conducting interviews, managing crime scenes, and developing informants, while recognizing the limitations of traditional investigative methods
- - Describe the specialized units within police departments, such as vice, organized crime, internal affairs, and juvenile units, and explain their roles and functions in addressing specific types of crimes and issues within the community
- - Understand the distinction between substantive and procedural criminal law and recognize their significance in the criminal justice system.
- - Explain the key constitutional amendments (Fourth, Fifth, and Sixth Amendments) and their implications on police conduct, including searches, arrests, interrogations, and the use of force, as well as the concept of Miranda warnings and the exclusionary rule.

**Unit: CRIMJ02: 06: VI. Courts - Structure and processes**

## Learning Objectives:

- - Compare federal and state courts.
- - Define jurisdiction.

- - Compare original and appellate jurisdiction.
- - Identify the federal courts and determine each court's jurisdiction.
- - Identify the state courts and determine each court's jurisdiction.
- - Describe the evolving role of the courts since the ratification of the Constitution
- - Explain why courts are uniquely situated to protect individual rights
- - Recognize how the courts make public policy
- - Describe the dual court system and its three tiers
- - Explain how you are protected and governed by different U.S. court systems
- - Compare the positive and negative aspects of a dual court system
- - Describe the differences between the U.S. district courts, circuit courts, and the Supreme Court
- - Explain the significance of precedent in the courts' operations
- - Describe how judges are selected for their positions
- - Analyze the structure and important features of the Supreme Court
- - Explain how the Supreme Court selects cases to hear
- - Discuss the Supreme Court's processes and procedures
- - Describe how the Supreme Court decides cases and issues opinions
- - Identify the various influences on the Supreme Court
- - Explain how the judiciary is checked by the other branches of government

***Unit: CRIMJ02: 07: VII. Sentencing***

Learning Objectives:

- - Compare an inhumane procedure with disproportionate punishment under the Eighth Amendment.
- - Identify the most prevalent method of execution pursuant to the death penalty.
- - Ascertain crime(s) that merit capital punishment.
- - Identify three classifications of criminal defendants who cannot be constitutionally punished by execution.
- - Define three-strikes laws, and ascertain if they constitute cruel and unusual punishment pursuant to the Eighth Amendment.
- - Ascertain the constitutionality of sentencing enhancements under the Sixth Amendment right to a jury trial.

**Introduction to Criminal Investigation: Processes, Practices and Thinking**

***Unit: Introduction to Criminal Investigation: Processes, Practices and Thinking***

Learning Objectives:

- - Explain the key principles and limitations of police discretion in Canada, as outlined in the R v Beaudry (2007) ruling, and understand its importance in maintaining a functional criminal justice system
- - Distinguish between the legal concepts of arrest and detention in Canada, recognizing the critical differences in the evidence required and the strategic purposes of each action within the context of law enforcement
- - Understand the importance of disclosure in the Canadian legal system, including the rights of the accused to access evidence and the role of the crown prosecutor in making disclosure decisions.
- - Identify the principles and exceptions related to hearsay evidence, including when it may be admissible in court, such as dying declarations, spontaneous utterances, and statements from child witnesses, while considering the necessity and reliability criteria.
- - Understand the concept of "exigent circumstances" in law enforcement, including when and why officers can exercise powers without a warrant, and recognize situations where exigent circumstances apply.
- - Develop proficiency in assessing and responding to evolving criminal events, distinguishing between active and inactive events, and knowing when to transition from a Tactical Investigative Response to a Strategic Investigative Response based on the Response Transition Matrix (RTM).
- - Understand the key principles of strategic investigative response, including the avoidance of common investigative errors and the importance of collecting, analyzing, and prioritizing evidence effectively.
- - Learn the use of the STAIR (Strategic Investigative Response) tool as a structured approach to develop and articulate investigative thinking processes, with a focus on achieving desired investigative results while following established rules and protocols
- - Demonstrate the ability to apply the STAIR (Situation, Tasks, Analysis, Investigation, and Results) investigative tool to analyze and develop theories for criminal cases, considering factors such as timelines, spatial relationships, and circumstantial evidence
- - Evaluate and validate crime reports by considering evidence that supports the occurrence, timing, location, and modus operandi of a criminal event, leading to the formation of reasonable grounds for further investigation or potential arrest
- - Understand the critical factors that influence witness credibility in criminal investigations, including the impact of time on memory, the importance of physical abilities and cognitive perception, and the potential challenges posed by truthfully incorrect witnesses
- - Gain knowledge of best practices in witness interviews and suspect identification, such as the importance of conducting prompt interviews, the significance of recording and repetitively recounting details, and the protocols for conducting photo and live lineups in law enforcement

- - Understand the importance of crime scene management in preserving forensic integrity, including the concepts of contamination control, continuity of evidence, and the originating stages of evidence.
- - Learn the essential techniques and considerations for securing, documenting, and collecting physical evidence at crime scenes, including the use of diagrams, exhibit logs, and preventing cross-contamination, while recognizing the varying scales of investigation.
- - Identify and explain the key principles and rights outlined in the Canadian Youth Criminal Justice Act (CYCJA), including the rights of youth during police interactions and the requirements for assessing a youth's understanding of their rights
- - Demonstrate a clear understanding of ancillary criminal offences, such as conspiracy to commit an offence, attempting to commit an offence, being an accessory after the fact, aiding and abetting, and counselling a person to commit an offence, and be able to differentiate between these legal concepts and their implications in criminal investigations
- - Understand the key forensic disciplines and their roles, including forensic entomology, forensic odontology, and forensic engineering, and will be able to explain their significance in crime scene investigations
- - Identify and describe the various causes of death, such as laceration, asphyxiation, and toxic substances, and explain how forensic pathologists analyze evidence to determine the cause and manner of death in criminal investigations

### Introduction to Criminal Justice

#### *Unit: ICJ01: Crime, Criminal Justice, and Criminology*

##### Learning Objectives:

- - Increase the breadth of knowledge and understanding of the American Criminal Justice System
- - Enhance critical thinking skills via writing, reading, and discussion
- - Learn the history, functions, responsibilities, processes, and importance of each component of the criminal justice system
- - Become familiar with research and its relationship to criminal justice policy
- - Use the foundations learned about the American criminal justice system in future CCJ courses

#### *Unit: ICJ02: Defining and Measuring Crime and Criminal Justice*

##### Learning Objectives:

- - Increase the breadth of knowledge and understanding of the American Criminal Justice System
- - Enhance critical thinking skills via writing, reading, and discussion

- - Learn the history, functions, responsibilities, processes, and importance of each component of the criminal justice system
- - Become familiar with research and its relationship to criminal justice policy
- - Use the foundations learned about the American criminal justice system in future CCJ courses

#### *Unit: ICJ03: Criminal Law*

##### Learning Objectives:

- - Increase the breadth of knowledge and understanding of the American Criminal Justice System
- - Enhance their critical thinking skills via writing, reading, and discussion
- - learn the history, functions, responsibilities, processes, and importance of each component of the criminal justice system
- - Become familiar with research and its relationship to criminal justice policy
- - Use the foundations learned about the American criminal justice system in future CCJ courses

#### *Unit: ICJ04: Criminal Justice Policy*

##### Learning Objectives:

- - Increase the breadth of knowledge and understanding of the American Criminal Justice System
- - Enhance their critical thinking skills via writing, reading, and discussion
- - Learn the history, functions, responsibilities, processes, and importance of each component of the criminal justice system
- - become familiar with research and its relationship to criminal justice policy
- - Use the foundations learned about the American criminal justice system in future CCJ courses

#### *Unit: ICJ05: Criminological Theory*

##### Learning Objectives:

- - Increase the breadth of knowledge and understanding of the American Criminal Justice System
- - Enhance critical thinking skills via writing, reading, and discussion
- - Learn the history, functions, responsibilities, processes, and importance of each component of the criminal justice system
- - Become familiar with research and its relationship to criminal justice policy
- - Use the foundations learned about the American criminal justice system in future CCJ courses

***Unit: ICJ06: Policing***

## Learning Objectives:

- - Increase the breadth of knowledge and understanding of the American Criminal Justice System
- - Enhance critical thinking skills via writing, reading, and discussion
- - Learn the history, functions, responsibilities, processes, and importance of each component of the criminal justice system
- - Become familiar with research and its relationship to criminal justice policy
- - Use the foundations learned about the American criminal justice system in future CCJ courses

***Unit: ICJ07: Courts***

## Learning Objectives:

- - increase the breadth of knowledge and understanding of the American Criminal Justice System
- - Enhance critical thinking skills via writing, reading, and discussion
- - Learn the history, functions, responsibilities, processes, and importance of each component of the criminal justice system
- - Become familiar with research and its relationship to criminal justice policy
- - Use the foundations learned about the American criminal justice system in future CCJ courses

***Unit: ICJ08: Corrections***

## Learning Objectives:

- - Increase the breadth of knowledge and understanding of the American Criminal Justice System
- - Enhance critical thinking skills via writing, reading, and discussion
- - Learn the history, functions, responsibilities, processes, and importance of each component of the criminal justice system
- - Become familiar with research and its relationship to criminal justice policy
- - Use the foundations learned about the American criminal justice system in future CCJ courses

***Unit: ICJ09: Community Corrections***

## Learning Objectives:

- - Increase the breadth of their knowledge and understanding of the American Criminal Justice System
- - Enhance critical thinking skills via writing, reading, and discussion

- - Learn the history, functions, responsibilities, processes, and importance of each component of the criminal justice system
- - Become familiar with research and its relationship to criminal justice policy
- - Use the foundations learned about the American criminal justice system in future CCJ courses

### *Unit: ICJ10: Juvenile Justice*

#### Learning Objectives:

- - Increase the breadth of knowledge and understanding of the American Criminal Justice System
- - Enhance critical thinking skills via writing, reading, and discussion
- - Learn the history, functions, responsibilities, processes, and importance of each component of the criminal justice system
- - Become familiar with research and its relationship to criminal justice policy
- - Use the foundations learned about the American criminal justice system in future CCJ courses

## **Manufacturing**

### **Almon, Inc.**

#### **Hydraulics**

##### *Unit: Basic Hydraulics 1*

#### Learning Objectives:

- - Understand hydraulic fundamentals.
- - Identify hydraulic components.

##### *Unit: Basic Hydraulics 2*

#### Learning Objectives:

- - Perform calculations using Pascal's Law.
- - Identify tools specific to hydraulic use.

##### *Unit: Basic Hydraulics 3*

#### Learning Objectives:

- - Analyze symptoms in the least amount of time.
- - Analyze symptoms with minimal wasted effort.

### ***Unit: Hydraulic Schematic Overview***

Learning Objectives:

- - Interpret a basic electrical schematic.
- - Identify electrical schematic symbols.
- - Understand the fundamental purpose and use of a schematic.

### **Powertrain**

#### ***Unit: Clutch and Brake Steering***

Learning Objectives:

- - Identify output shaft, steering clutch, input shaft, brake clutch.
- - Describe how clutch and brake steering works during a pivot turn and during a gradual steer.

#### ***Unit: Diesel Engine Fundamentals***

Learning Objectives:

- - Identify components of a diesel engine.
- - Recognize basic principles of a diesel engine.
- - Describe the relationship between components of a diesel engine.

#### ***Unit: Countershaft Transmission***

Learning Objectives:

- - Understand how the clutch pack operates.
- - Describe transmission controllers, sensors and control valves.
- - Understand fundamentals of countershaft transmission power flow.

#### ***Unit: Differential and Axle Fundamentals***

Learning Objectives:

- - Recognize different types of differentials and axles.
- - Identify basic components of differentials and axles.
- - Locate components in the assembly.

#### ***Unit: Tier 4 Emissions***

Learning Objectives:

- - Understand basic exhaust emission requirements and tier ratings.
- - Identify common Tier 4 engine components.
- - Understand Tier 4 operation and exhaust management/filtration fundamentals.



- - Understand Tier 4 engines as they apply to machines in the construction, agriculture, and outdoor power equipment industries.

#### ***Unit: Transmission Fundamentals***

Learning Objectives:

- - Label the components of a transmission.
- - Differentiate transmission types.
- - Correlate components with different transmission types.
- - Classify transmissions by their method of power transfer.

#### ***Unit: Gear Fundamentals***

Learning Objectives:

- - Describe five types of gears.
- - Understand how a gear train works.

#### ***Unit: Planetary Transmissions***

Learning Objectives:

- - Comprehend how the planetary clutch pack operates.
- - Understand fundamentals of a how a modulation clutch operates.
- - Describe the transmission power flow process for forward 4th gear.

#### ***Unit: Torque Converter Fundamentals***

Learning Objectives:

- - Describe the three main parts of a torque converter.
- - Define the concept of "transfer of rotary motion."

### **Tools**

#### ***Unit: Basic Hand Tools***

Learning Objectives:

- - Examine tools to verify they meet safety standards.
- - Select tools based upon the job at hand.
- - Differentiate between tools by the features and functionality.

#### ***Unit: Precision Measuring Tools***

Learning Objectives:

- - Recognize safety issues involved with precision measuring tools.
- - Identify basic precision measuring tools.

- - Comprehend various types of precision measuring tools.
- - Understand fundamentals of proper use of precision measuring tools.
- - Understand proper care techniques for precision measuring tools.

## CLX

### Automotive Basics

#### *Unit: Batteries, Starting, and Charging: Automotive Batteries*

##### Learning Objectives:

- - Perform battery state-of-charge test; determine necessary action.
- - Confirm proper battery capacity for vehicle application; perform battery capacity and load test: determine needed action.
- - Maintain or restore electronic memory functions.
- - Inspect and clean battery, fill battery cells, check battery cables, connectors, clamps, and hold-downs.
- - Perform slow/fast battery charge according to manufacturer's recommendations.
- - Jump-start vehicle using jumper cables and a booster battery or an auxiliary power supply.
- - Identify safety precautions for high-voltage systems on electric, hybrid-electric and diesel vehicles.
- - Identify electrical/electronic modules, security systems, radios, and other accessories that require reinitialization or code entry after reconnecting vehicle battery.
- - Identify hybrid vehicle auxiliary (12v) battery service, repair, and test procedures.
- - Research vehicle service information, including vehicle service history, service precautions, and technical service bulletins.
- - Identify hybrid vehicle auxiliary (12v) battery service, repair, and test procedures.

#### *Unit: Batteries, Starting, and Charging: Starting Systems*

##### Learning Objectives:

- - Perform starter current draw tests; determine needed action.
- - Perform starter circuit voltage drop tests; determine needed action.
- - Inspect and test starter relays and solenoids; determine needed action.
- - Remove and install starter in a vehicle.
- - Inspect and test switches, connectors, and wires of starter control circuits; perform needed action.
- - Demonstrate knowledge of an automatic idle-stop/start-stop system.

#### *Unit: Batteries, Starting, and Charging: Charging Systems*

##### Learning Objectives:

- - Perform charging system output test; determine needed action.
- - Inspect, adjust, and/or replace generator (alternator) drive belts; check pulleys and tensioners for wear; check pulley and belt alignment.
- - Remove, inspect, and/or replace generator (alternator).
- - Perform charging circuit voltage drop tests; determine needed action.

***Unit: Batteries, Starting, and Charging: Summative Assessment***

No Learning Objectives available.

***Unit: Automatic Transmission: Components and Operation***

Learning Objectives:

- - Research vehicle and service information, including fluid type, vehicle service history, service precautions, and technical service bulletins.
- - Check fluid level in a transmission or a transaxle equipped with a dip-stick.
- - Check fluid level in a transmission or a transaxle not equipped with a dip-stick.
- - Check transmission fluid condition; check for leaks.
- - Identify drive train components and configuration.

***Unit: Automatic Transmission: Maintenance and Adjustment***

Learning Objectives:

- - Inspect, adjust, and/or replace external manual valve shift linkage, transmission range sensor/switch, and/or park/neutral position switch.
- - Inspect for leakage at external seals, gaskets, and bushings.
- - Inspect, replace and/or align powertrain mounts.
- - Drain and replace fluid and filter(s); use proper fluid type per manufacturer specification.

***Unit: Automatic Transmissions: Alternative Transmissions***

Learning Objectives:

- - Describe the operational characteristics of a continuously variable transmission (CVT).
- - Describe the operational characteristics of a hybrid vehicle drive train.

***Unit: Automatic Transmission: Summative Assessment***

No Learning Objectives available.

***Unit: Brakes: Overview***

Learning Objectives:

- - Research vehicle service information including fluid type, vehicle service history, service precautions, and technical service bulletins.

- - Describe procedure for performing a road test to check brake system operation; including an anti-lock brake system (ABS).
- - Install wheel and torque lug nuts.
- - Identify brake system components and configuration.

#### ***Unit: Brakes: Hydraulic System***

##### Learning Objectives:

- - Describe proper brake pedal height, travel, and feel.
- - Check master cylinder for external leaks and proper operation.
- - Inspect brake lines, flexible hoses, and fittings for leaks, dents, kinks, rust, cracks, bulging, wear and loose fittings/supports.
- - Select, handle, store, and fill brake fluids to proper level; use proper fluid type per manufacturer specification.
- - Identify components of hydraulic brakewarning light system.
- - Bleed and/or flush brake system.
- - Test brake fluid for contamination.

#### ***Unit: Brakes: Drum Brakes***

##### Learning Objectives:

- - Remove, clean, and inspect brake drum; measure brake drum diameter; determine serviceability.
- - Refinish brake drum and measure final drum diameter; compare with specifications.
- - Remove, clean, inspect and/or replace brake shoes, springs, pins, clips, levers, adjusters/self-adjusters, other related brake hardware, and backing support plates; lubricate and reassemble.
- - Inspect wheel cylinders for leaks and proper operation; remove and replace as needed.
- - Pre-adjust brake shoes and parking brake; install brake drums or drum/hub assemblies and wheel bearings; perform final checks and adjustments.

#### ***Unit: Brakes: Disc Brakes***

##### Learning Objectives:

- - Remove and clean caliper assembly; inspect for leaks and damage/wear: determine needed action.
- - Inspect caliper mounting and slides/pins for proper operation, wear, and damage; determine needed action.
- - Remove, inspect and/or replace brake pads and retaining hardware; determine needed action.
- - Lubricate and reinstall caliper, brake pads, and related hardware; seat brake pads and inspect for leaks.

- - Clean and inspect rotor and mounting surface, measure rotor thickness, thickness variation, and lateral runout; determine needed action.
- - Remove and reinstall/replace rotor.
- - Refinish rotor on vehicle; measure final rotor thickness and compare with specifications.
- - Refinish rotor off vehicle; measure final rotor thickness and compare with specifications.
- - Retract and re-adjust caliper piston on an integral parking brake system.
- - Check brake pad wear indicator; determine needed action.
- - Describe importance of operating vehicle to burnish/break-in replacement brake pads according to manufacturer's recommendations.

#### ***Unit: Brakes: Power Assist Systems***

Learning Objectives:

- - Check brake pedal travel with, and without, engine running to verify proper power booster operation.
- - Identify components of the brake power assist system (vacuum and hydraulic); check vacuum supply (manifold or auxiliary pump) to vacuum-type power booster.

#### ***Unit: Brakes: Wheel Bearings, Parking Brakes, and Brake Lights***

Learning Objectives:

- - Remove, clean, inspect, repack, and install wheel bearings; replace seals; install hub and adjust bearings.
- - Check parking brake system components for wear, binding, and corrosion; clean, lubricate, adjust and/or replace as needed.
- - Check parking brake operation and parking brake indicator light system operation; determine necessary action.
- - Check operation of brake stop light system.
- - Replace wheel bearing and race.
- - Inspect and replace wheel studs.

#### ***Unit: Brakes: ABS, Traction, and Stability Control Systems***

Learning Objectives:

- - Identify traction control/vehicle stability control system components.
- - Describe the operation of a regenerative braking system.

#### ***Unit: Brakes: Summative Assessment***

No Learning Objectives available.

***Unit: Drivetrain: Overview***

Learning Objectives:

- - Research vehicle service information including; fluid type, vehicle service history, service precautions, and technical service bulletins.
- - Drain and refill manual transmission/transaxle and final drive unit; use proper fluid type per manufacturer specification.
- - Check fluid condition; check for leaks.
- - Identify manual drive train and axle components and configuration.

***Unit: Drivetrain: Clutch Diagnosis and Repair***

Learning Objectives:

- - Check and adjust clutch master cylinder fluid level; use proper fluid type per manufacturer specification
- - Check for hydraulic system leaks.

***Unit: Drivetrain: Manual Transmission***

Learning Objectives:

- - Describe the operational characteristics of an electronically-controlled manual transmission/transaxle.

***Unit: Drivetrain: Driveshafts and Halfshafts***

Learning Objectives:

- - Inspect, remove, and/or replace bearings,hubs, and seals.
- - Inspect, service, and/or replace shafts, yokes, boots, and universal CV joints.
- - Inspect locking hubs.
- - Check for leaks at drive assembly and transfer case seals; check vents; check fluid level; use proper fluid type per manufacturer specification.

***Unit: Drivetrain: Differential Assemblies and Drive Axle Assemblies***

Learning Objectives:

- - Clean and inspect differential case; check for leaks; inspect housing vent.
- - Check and adjust differential case fluid level; use proper fluid type per manufacturer specification.
- - Drain and refill differential housing.
- - Inspect and replace drive axle wheel studs.

***Unit: Drivetrain: Four-Wheel Drive/All-Wheel Drive Diagnosis and Repair***

Learning Objectives:

- - Understand Four-Wheel Drive Overview
- - Perform Inspection of Front-Wheel Bearings and Locking Hubs
- - Check Drive Assembly Seals and Vents
- - Check the Lube Level

***Unit: Drivetrain: Summative Assessment***

No Learning Objectives available.

***Unit: Service and Safety: Automotive Technology Careers***

Learning Objectives:

- - Understand Automotive Technology Careers
- - Understand Automotive Technology Opportunities
- - Understand Automotive Technology Training and Certification
- - Understand Automotive Technology Job Prospects
- - Understand Automotive Technology Payment Methods
- - Understand Automotive Technology Other Facts

***Unit: Service and Safety: Shop and Personal Safety***

Learning Objectives:

- - Identify general shop safety rules and procedures.
- - Locate and demonstrate knowledge of material safety data sheets (MSDS).
- - Identify marked safety areas.
- - Identify the location and the types of fire extinguishers and other fire safety equipment; demonstrate knowledge of the procedures for using fire extinguishers and other fire safety equipment.
- - Identify the location and use of eye wash stations.
- - Identify the location of the posted evacuation routes.
- - Comply with the required use of safety glasses, ear protection, gloves, and shoes during lab/shop activities.
- - Identify and wear appropriate clothing for lab/shop activities.
- - Secure hair and jewelry for lab/shop activities.
- - Demonstrate awareness of the safety aspects of supplemental restraint systems (SRS), electronic brake control systems, and hybrid vehicle high voltage circuits.
- - Demonstrate awareness of the safety aspects of high voltage circuits (such as high intensity discharge (HID) lamps, ignition systems, injection systems, etc.).
- - Utilize safe procedures for handling of tools and equipment.
- - Identify and use proper placement of floor jacks and jack stands.
- - Identify and use proper procedures for safe lift operation.
- - Utilize proper ventilation procedures for working within the lab/shop area.

***Unit: Service and Safety: Cleaners and Lubricants***

Learning Objectives:

- - Understand Cleaners, Lubricants, and Specialty Chemicals: General Rules
- - Understand Cleaners, Lubricants, and Specialty Chemicals: Solvents
- - Understand Cleaners, Lubricants, and Specialty Chemicals: Oils
- - Understand Cleaners, Lubricants, and Specialty Chemicals: Greases
- - Understand Cleaners, Lubricants, and Specialty Chemicals: Specialty Additives
- - Understand Cleaners, Lubricants, and Specialty Chemicals: Specialty Chemicals

***Unit: Service and Safety: Tools and Equipment***

Learning Objectives:

- - Identify tools and their usage in automotive applications.
- - Identify standard and metric designation.
- - Demonstrate safe handling and use of appropriate tools.
- - Demonstrate proper cleaning, storage, and maintenance of tools and equipment.
- - Demonstrate proper use of precision measuring tools (i.e. micrometer, dial-indicator, dial-caliper).

***Unit: Service and Safety: Vehicle Service Preparation***

Learning Objectives:

- - Ensure vehicle is prepared to return to customer per school/company policy (floor mats, steering wheel cover, etc.).
- - Identify information needed and the service requested on a repair order.
- - Identify purpose and demonstrate proper use of fender covers, mats.
- - Demonstrate use of the three "C's" (concern, cause, and correction).
- - Review vehicle service history.
- - Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction.

***Unit: Service and Safety: Summative Assessment***

No Learning Objectives available.

***Unit: Steering and Suspension: Overview***

Learning Objectives:

- - Research vehicle service information including fluid type, vehicle service history, service precautions, and technical service bulletins.
- - Disable and enable supplemental restraint system (SRS); verify indicator lamp operation.



***Unit: Steering and Suspension: Steering and Suspension Service***

## Learning Objectives:

- - Inspect rack and pinion steering gear inner tie rod ends (sockets) and bellows boots.
- - Inspect power steering fluid level and condition.
- - Flush, fill, and bleed power steering system; use proper fluid type per manufacturer specification.
- - Inspect for power steering fluid leakage.
- - Remove, inspect, replace, and adjust power steering pump drive belt.
- - Inspect and replace power steering hoses and fittings.
- - Inspect pitman arm, relay (center link/intermediate) rod, idler arm, mountings, and steering linkage damper.
- - Inspect tie rod ends (sockets), tie rod sleeves, and clamps.
- - Inspect upper and lower control arms, bushings, and shafts.
- - Inspect and replace rebound bumpers.
- - Inspect track bar, strut rods/radius arms, and related mounts and bushings.
- - Inspect upper and lower ball joints (with or without wear indicators).
- - Inspect suspension system coil springs and spring insulators (silencers).
- - Inspect suspension system torsion bars and mounts.
- - Inspect and/or replace front/rear stabilizer bar (sway bar) bushings, brackets, and links.
- - Inspect, remove, and/or replace strut cartridge or assembly; inspect mounts and bushings.
- - Inspect front strut bearing and mount.
- - Inspect rear suspension system lateral links/arms (track bars), control (trailing) arms.
- - Inspect rear suspension system leaf spring(s), spring insulators (silencers), shackles, brackets, bushings, center pins/bolts, and mounts.
- - Inspect, remove, and/or replace shock absorbers; inspect mounts and bushings.
- - Inspect electric power steering assist system.
- - Identify hybrid vehicle power steering system electrical circuits and safety precautions.
- - Describe the function of suspension and steering control systems and components, (i.e. active suspension, and stability control).

***Unit: Steering and Suspension: Wheel Alignment***

## Learning Objectives:

- - Perform pre-alignment inspection; measure vehicle ride height.
- - Describe alignment angles (camber, caster and toe).

***Unit: Steering and Suspension: Wheels and Tires***

Learning Objectives:

- - Dismount, inspect, and remount tire on wheel; balance wheel and tire assembly.
- - Dismount, inspect, and remount tire on wheel equipped with tire pressure monitoring system sensor.
- - Inspect tire and wheel assembly for air loss; determine needed action.
- - Repair tire following vehicle manufacturer approved procedure.
- - Identify indirect and direct tire pressure monitoring systems (TPMS); calibrate system; verify operation of instrument panel lamps.
- - Inspect tire condition; identify tire wear patterns; check for correct tire size, application (load and speed ratings), and air pressure as listed on the tire information placard/label.
- - Rotate tires according to manufacturer's recommendations including vehicles equipped with tire pressure monitoring systems (TPMS).
- - Demonstrate knowledge of steps required to remove and replace sensors in a tire pressure monitoring system, (TPMS) including relearn procedure.

***Unit: Steering and Suspension: Summative Assessment***

No Learning Objectives available.

**Open Textbooks****Support for CNC*****Unit: CNC00: Introduction to Computer Numerical Control (CNC)***

Learning Objectives:

- - Identify purpose of the control panel on a CNC machine
- - Identify information displayed on digital readout panel
- - Identify six things a CNC operator needs to know
- - Define critical dimensions
- - Understand importance of condition of the cutters
- - Identify tool numbers
- - Understand importance of surface finishes
- - Understand the CNC Operation.
- - List the steps to set up and operate a CNC mill.
- - Identify the location and purpose of the operating controls on the Haas CNC Mill control.
- - Start and home a CNC machine.
- - Load tools into tool carousel.

- - Set Tool Length Offsets.
- - Set Part Offsets.
- - Load a CNC program into the machine control.
- - Dry run
- - Safely run a new CNC program.
- - Adjust offsets to account for tool wear and deflection.
- - Shut down a CNC machine correctly.
- - Describe Letter Address Commands
- - Identify the motions of a CNC machine
- - Discuss the motions of a CNC machine
- - understand mechanical backlash in machine operation
- - identify backlash mechanism (the ball screw) in CNC machines

#### *Unit: CNC01: Lesson 1 IMTL-136 Workbook*

Learning Objectives:

- - Identify the program's list instructions.
- - Understand the Program Format
- - Understand the G & M Codes.
- - recognize tool numbers
- - understand code to change tool
- - calculate the spindle speed RPM for milling
- - turn on a spindle in the proper direction
- - Identify G54-G59 codes for specific workpiece locations on the table
- - Describe importance of matching G54-G59 codes with work offset registry.

#### *Unit: CNC02: Lesson 2 IMTL-136 Workbook*

Learning Objectives:

- - Identify the difference between linear and linear interpolated machine moves
- - Describe the difference with Z0 machine home versus Z0 on the part.
- - Describe Best Practices for setting Z axis cutting depths.
- - identify Tool Length Offsets
- - identify Tool Height Offset Compensation
- - recognize Tool Length Offset register
- - identify CNC codes for turning coolant on and off

#### *Unit: CNC03: Lesson 3 IMTL-136 Workbook*

Learning Objectives:

- - recognize rapid position motion

- - identify why rapid positioning motion is used
- - recognize linear interpolation motion
- - identify why linear interpolation motion is used
- - identify the Cartesian Coordinate system
- - identify how the coordinates are expressed in CNC programs
- - Identify the four quadrants of the coordinate system
- - identify CNC codes for turning coolant on and off
- - identify incremental movements
- - identify modal commands
- - recognize the reference for origin in CNC codes

***Unit: CNC04: Lesson 4 IMTL-136 Workbook***

Learning Objectives:

- - identify CNC machine coordinates
- - recognize where Machine Home is located
- - identify when to command stop for the spindle
- - recognize the difference in different types of machine stops
- - calculate feed rates

***Unit: CNC05: Lesson 5 IMTL-136 Workbook***

Learning Objectives:

- - Use four questions to write a code to cut an arc
- - find the center of an arc
- - measure to the center
- - write a CNC code to cut an arc

***Unit: CNC06: Lesson 6 IMTL-136 Workbook***

Learning Objectives:

- - identify the reasons for using cutter compensation
- - choose between G41 and G42 in CNC code
- - identify the best practices for using Cutter Compensation commands
- - understand the purpose for a Lead In
- - describe the movement of Lead In

***Unit: CNC07: Lesson 7: IMTL-153 Mills***

Learning Objectives:

- - Identify and describe an address in CNC Code
- - Identify and describe a word in CNC Code

- - Identify and describe an argument in CNC Code
- - Identify and describe a block in CNC Code
- - Identify and describe a line number in CNC Code
- - Identify and describe a canned cycle for CNC code
- - Identify basic functions within a canned cycle
- - Identify and describe two types of R-planes used in CNC codes
- - Identify the purpose of G98 and G99 CNC codes
- - Identify and describe G81 Drill Canned Cycle for CNC code
- - Identify and describe G80 Cancel Canned Cycle
- - Identify Z-depth for a center drill
- - Calculate Z-axis (part thickness + radius of drill) for thru holes
- - Write a three-part CNC program using G81 canned cycle code
- - Identify a deep hole
- - Identify and describe G83 Multi-Peck Drill Canned Cycle
- - Identify and describe the G83 variables of I, J, and K
- - Calculate the values for I, J, and K
- - Calculate Speed and Feed reductions for use with deep holes
- - Identify and describe G84 Tapping Canned Cycle
- - Locate notes for tapping speed reductions on CNC Speed and Feed chart
- - Find the appropriate drill size for a hole
- - Calculate the feed rate for G84

***Unit: CNC08: Lesson 8: IMTL-153 Turning Machines***

**Learning Objectives:**

- - Identify and describe parameters on CNC turning center (lathe)
- - Identify and describe G02 and G03 on a CNC turning center
- - Identify and describe I and K-Method for arcs on a CNC turning center
- - Identify and describe U and W with G02/G03 blocks
- - Define G96 Constant Surface Speed (CSS)
- - Describe the purpose of G96 CSS
- - Identify and Describe G50
- - Describe nub removal
- - Identify and describe G71 Roughing Cycle variables
- - Identify and use N words within P and Q variables in G71
- - Identify finish allowance
- - Apply finish allowance to U and W words in G71
- - Identify and describe G76 Threading Cycle
- - Calculate for K word used in G76
- - Calculate for D word used in G76

- - Selection number of passes for N word in G76

#### ***Unit: CNC09: Lesson 9: HAAS***

Learning Objectives:

- - Identify the Haas Control.
- - Identify the Keyboard.
- - Describe Start/Home Machine procedure.
- - Describe Door Override procedure.
- - Describe Load Tools procedure.
- - Describe Tool Length Offset (TLO) for each tool.
- - Verify part zero offset(XY) using MDI.
- - Describe the setting tool offset.
- - Verify Tool Length offset using MDI.
- - Describe the procedure of load CNC program.
- - Describe the procedure of save CNC program.
- - Explain how to run CNC program.
- - Describe the use of cutter diameter compensation.
- - Describe the shut down program.

#### ***Unit: CNC10: References***

Learning Objectives:

- - Completion

## **TPC**

### **331 Bulk-Handling Conveyors**

#### ***Unit: 331 Bulk-Handling Conveyors***

Learning Objectives:

- - Describe the basic operation of a bulk-handling belt conveyor and identify its major components.
- - Name and explain the function of the different pulleys used in belt conveyors.
- - Describe four popular conveyor drive-package arrangements.
- - Explain the purpose and the operation of at least four of the support components of a bulk-handling belt conveyor.
- - Describe the composition and structure of the three components of a bulk-handling conveyor belt.

- - State correct storage and handling procedures for bulk conveyor belts.
- - Detail the installation of a belt in a bulk conveyor system, including splicing and tensioning.
- - Name the five points that require special attention in a preventive maintenance program for a belt conveyor system.
- - Describe the design and placement of blade, brush, and plow belt cleaners and the applications for which each one would be used.
- - Name and describe the different types of blade belt cleaners.
- - Describe the process of belt cleaning by rollover.
- - Explain how devices such as wing pulleys, self-cleaning return idlers, and deck plates function as parts of a belt cleaning system.
- - Describe the appropriate safety precautions to take when installing or maintaining belt cleaners.
- - List the essential features of preventive maintenance and inspection for a belt cleaning system.
- - Explain two important factors in efficient conveyor loading and how they are affected by the two ways (directions) in which belt conveyors are loaded.
- - Describe the construction and the purpose of skirtboards.
- - Differentiate between a deadbed and a bed of fines and detail the use of both in chute loading of conveyors.
- - Name and explain the operation of three special types of discharge spouts
- - Differentiate between a conveyor profile and a system profile.
- - Point out the special hazards for workers at conveyor loading and discharge points.
- - Explain the function and operation of the following emergency controls: electrical interlocks, backstops, level switches, pull-chords, and conveyor belt alignment switches.
- - Name at least five safety measures employees should take to protect themselves when working on or near bulk-handling conveyors.
- - Describe the three-step procedure for preventing accidental startup of a conveyor during maintenance work.
- - Name at least one specific chore or safety caution required in maintenance work on each of the following: belts, idlers, pulleys, and drive systems.
- - Identify common problems (and their probable causes) found in troubleshooting idlers, pulleys, take up bearings, and conveyor drives.

## 501 Introduction to Industrial Robotics

### *Unit: 501 Introduction to Robotics*

#### Learning Objectives:

- - Identify why robots did not appear in large numbers in manufacturing until the late 1970s.

- - State the Robot Industries Association's definition of an industrial robot and explain the two key words.
- - Describe how industrial robots are used in batch production systems.
- - Explain how industrial robots are used in repetitive manufacturing systems that utilize transfer lines.
- - List at least three factors that should be considered as part of a risk assessment when a robot system is in the development stage.
- - Describe and contrast the following guarding methods: barrier, presence-sensing device, awareness device, warning system.
- - Define the term zero-energy state.
- - Name and describe the basic building blocks of an industrial robot.
- - Name and describe the additional components that make up a robot system.
- - Define the following robot terms: degrees of freedom, position axes, orientation axes, work envelope, tool center point.
- - Define and give an example of the following specifications for industrial robots: payload, repeatability, memory capacity, and environmental requirements.
- - Explain the difference between accuracy and repeatability in robots.
- - Identify the five methods of classifying industrial robots.
- - Explain the difference between robots with closed-loop control and those with openloop control.
- - Describe the techniques used in closed- and open-loop control in robot systems.
- - List the advantages and disadvantages of open-and closed-loop control in robot systems.
- - Distinguish between assembly and nonassembly robots according to the application for which they were designed.
- - Classify robots by arm geometry, power source, and path control techniques.
- - Identify the basic robot work envelopes and name the arm geometries that produce them.
- - Name the basic power sources used for robot motion and give an advantage and disadvantage of each.
- - Identify the basic path-control techniques and describe their characteristics.
- - List the two types of interfaces and three groups of sensors used in industrial robot systems.
- - Describe the primary simple contact sensor commonly found in robot systems.
- - Identify and explain the operation of the two simple noncontact sensors most often used in industrial robot installations.
- - Explain the difference between the simple sensor interface and complex sensor interface.
- - Identify and describe vision and tactile sensors and the systems required to support them.



- - Name the five general requirements all tooling must satisfy.
- - Identify and describe briefly the four basic tooling power sources.
- - Describe the five categories of end-of-arm tooling used in robot applications.
- - Explain the function and advantages of a quick-change device.
- - Define the term compliance and explain why it is important.
- - List and describe the four basic functions of the computer(s) controlling an automated work cell.
- - Name the two major types of robot programming and give advantages and disadvantages of each.
- - Name and describe two basic methods of teach programming and tell when each is used.
- - List three advantages of off-line programming.
- - Name the two elements of a computer program for off-line robot programming.
- - Explain the basics of ladder logic programming.

### TPC Air Conditioning & Refrigeration Training

#### *Unit: 431 The Refrigeration Cycle*

##### Learning Objectives:

- - Define refrigeration and air conditioning and explain how they differ.
- - Describe the two methods of lowering the temperature of a material.
- - Name the three physical states of matter.
- - Identify what causes matter to change its state.
- - Explain the difference between sensible and latent heat.
- - Compare the Fahrenheit and Celsius temperature scales and convert temperatures from one to another.
- - Name and describe the three methods of heat transfer.
- - Define latent heat of fusion and latent heat of vaporization.
- - Explain the difference between absolute pressure and gauge pressure.
- - Describe the effect of pressure changes on boiling point.
- - Explain the function of each of the major refrigeration system components: evaporator, compressor, condenser, and metering device.
- - Define the terms subcooling and superheating.
- - Explain the function of the refrigerant in a refrigeration system and trace its path.
- - Contrast dry-expansion and flooded evaporators.
- - Name the five main types of compressors.
- - Define cooling medium and name the two most commonly used.
- - Explain the operation of the six most common metering devices.
- - State the definition of psychrometrics.

- - List the four air properties important in psychrometrics.
- - Differentiate between dry- and wet-bulb temperature and tell how each is measured.
- - Define the term saturated air.
- - Define specific humidity and relative humidity.
- - Define enthalpy and explain how it is calculated.
- - Demonstrate how to use the psychrometric chart to determine dewpoint temperature, specific humidity, relative humidity, and enthalpy.
- - Describe a gauge manifold and tell how it is used.
- - Tell what it means to evacuate a refrigeration system and tell how it is done.
- - List and describe at least three methods of leak detection.
- - Explain the construction of a sling psychrometer and tell how and why it is used.
- - Name the instrument used to measure relative humidity.
- - Name the instrument used to measure each of the following electrical values: potential difference, current, resistance, and electric power.
- - List the four classes of work area hazards, and give an example of each.

***Unit: 432 Refrigerants and Refrigerant Oils***

No Learning Objectives available.

***Unit: 433 Compressors***

No Learning Objectives available.

***Unit: 434 Evaporators and Metering Devices***

No Learning Objectives available.

***Unit: 435 Condensers and Cooling Towers***

No Learning Objectives available.

***Unit: 436 Piping***

No Learning Objectives available.

***Unit: 437 Control Systems***

No Learning Objectives available.

***Unit: 438 Air Handling Systems***

No Learning Objectives available.

***Unit: 439 System Troubleshooting***

No Learning Objectives available.

***Unit: 440 Absorption Chillers***

No Learning Objectives available.

***Unit: 441 - Heat Pumps***

No Learning Objectives available.

***Unit: 464 Purging, Piping, and Safety***

No Learning Objectives available.

**TPC Ammonia Refrigeration*****Unit: 461 Ammonia Refrigeration Basics***

No Learning Objectives available.

***Unit: 462 Positive Displacement Compressors***

No Learning Objectives available.

***Unit: 463 Evaporators, Conditioners, and Controls***

No Learning Objectives available.

**TPC Electrical Training Courses*****Unit: 201 Basic Electricity and Electronics***

No Learning Objectives available.

***Unit: 202 Batteries and DC Circuits***

No Learning Objectives available.

***Unit: 203 Transformers and AC Circuits***

No Learning Objectives available.

***Unit: 204.1 Electrical Measuring Instruments***

No Learning Objectives available.

***Unit: 205.1 Electrical Safety and Protection - v2***

No Learning Objectives available.

***Unit: 206 DC Equipment and Controls***

No Learning Objectives available.

***Unit: 207 Single-Phase Motors***

No Learning Objectives available.

***Unit: 208 Three-Phase Systems***

No Learning Objectives available.

***Unit: 209 AC Control Equipment***

No Learning Objectives available.

### **Unit: 210 Electrical Troubleshooting**

#### Learning Objectives:

- - Identify a control relay on an electrical schematic.
- - State the NEC requirements for fuses in ungrounded conductors.
- - Explain component numbering on electrical schematics.
- - Name the kinds of drawings used by electrical specialists.
- - Identify electrical symbols commonly used for building diagrams.
- - Describe a one-line diagram.
- - Discuss the different types of drawing characteristics.
- - Explain how severe three-phase voltage unbalance affects a three-phase motor.
- - List the advantages of inherent protection.
- - Explain how undervoltage release works.
- - Describe how to troubleshoot a motor circuit.
- - List the reasons why a magnet coil burns or short-circuits.
- - List the steps in troubleshooting a defective motor.
- - Explain how a mechanical latching relay works.
- - Explain how an electronic timing relay operates.
- - Demonstrate how to reverse the rotation of a three-phase induction motor.
- - Explain the function of limit switches in reversing-motor applications.
- - Describe how to use a checking-sequence chart.
- - Select the best starter for use where it is undesirable to put a heavy load on the power supply.
- - Explain how to change the speed of a squirrel-cage motor.
- - Explain the effects of age on a selenium rectifier.
- - Name the protective devices used in electrical systems and pneumatic systems.
- - State the definition of a bistable device.
- - List the functions of a static control device.
- - List causes of electrical and mechanical vibration in a dc motor.
- - Explain how oil saturation affects brushes in a dc motor.
- - Explain how maximum bearing operating temperature is determined.
- - List problems in the motor control that can cause sudden or unexpected changes in motor speed.
- - Explain how to salvage a water-soaked motor.
- - Identify various kinds of three-phase motor failures.
- - Demonstrate how to conduct a balanced-current test on a three-phase, Y-connected winding.
- - List the symptoms of a reversed phase in a three-phase winding.
- - Explain how to identify external leads that have become defaced.
- - Demonstrate how to test for an open circuit in a split-phase motor.

- - Describe the elements of a planned maintenance program.
- - Explain the function of lamps, ballasts, and lighting controls.
- - Describe the basic troubleshooting process.
- - Detail how to troubleshoot common lamp-ballast system problems.
- - Describe lighting system commissioning.
- - Detail how to troubleshoot common occupancy-sensor and dimming-system problems.
- - Name and describe the elements of a sequence of operation.
- - List the features that must appear on an elementary wiring diagram to make it comply with JIC standards.
- - List the steps in troubleshooting a new machine.
- - List the information to be included in a motor location file.
- - Select the best method for identifying a motor.

***Unit: 211 Electrical Safety in the Workplace - Understanding NFPA 70E v2015***

No Learning Objectives available.

***Unit: 1005 Introductory - Introduction to Electricity***

No Learning Objectives available.

***Unit: 1006 Introductory - Mobile Electricity***

Learning Objectives:

- - Understand fundamentals of electricity such as voltage, current, basics of magnetism and Ohm's Law
- - Understand inductance, capacitance, and resistance
- - Understand the basics of DC circuits, including series circuits, parallel circuits, and series parallel circuits
- - Understand fundamental components that control circuit current and voltage, their applications, and their associated symbols
- - Understand how a battery stores and dispenses electrical power
- - Understand the alternator, which generates electricity and works with a voltage regulator to charge the battery and supply electrical power to the rest of the vehicle's electrical system
- - Understand the starting system, and the variations of components in the two circuits of the starting system
- - Understand remote start and stop features associated with many mobile vehicles

***Unit: 1008 Introductory - ACDC Drives***

No Learning Objectives available.

***Unit: 1009 Introductory - Multimeter Basics***

Learning Objectives:

- - Understand the fundamentals of using electrical testers
- - Understand testing circuits
- - Understand different circuit components

### TPC Energy Conservation

#### *Unit: 379 Mechanical Energy Conservation*

No Learning Objectives available.

#### *Unit: 380 Electrical Energy Conservation*

No Learning Objectives available.

#### *Unit: 376 Energy Conservation Basics*

No Learning Objectives available.

#### *Unit: 377 Energy Losses in Buildings*

No Learning Objectives available.

#### *Unit: 378 Heating/Cooling System Efficiency*

Learning Objectives:

- - Describe human comfort and the environmental factors affecting human comfort.
- - Explain heat generated within a building and explain thermal zones.
- - Explain the basic all-air HVAC system and name the types of all-air HVAC systems.
- - Explain what are single-path systems.
- - Explain what are multiple-path systems.
- - Describe general energy conservation.
- - Explain the guidelines for HVAC.
- - Describe measuring air velocity and volume flow rate.
- - Describe air pressure within a duct system.
- - Define the pitot tube.
- - Describe other airflow measuring devices.
- - Describe building ventilation requirements and how to determine ventilation requirements.
- - Explain the cost of using outside air.
- - Explain heat recovery systems.
- - Explain exhaust systems and conserving energy in exhaust systems.
- - Explain maintaining system components.
- - Explain what are heating units.
- - Describe warm air furnaces.
- - Define boilers and explain furnace and boiler maintenance.
- - Explain energy conservation in furnaces and boilers.

- - Explain stack gas analysis.
- - Describe purchased steam and hot water and metering steam and hot water.
- - Explain steam traps and steam trap maintenance.
- - Explain humidifiers.
- - Explain heating controls maintenance.
- - Describe domestic hot water.
- - Describe the types of refrigeration equipment.
- - Explain mechanical compression systems.
- - Explain the vapor-compression cycle.
- - Explain absorption refrigeration cycle.
- - Explain external refrigeration controls.
- - Explain internal controls and checking system operation.
- - Define evaporator temperatures and condenser temperatures.
- - Describe equipment for cooling condensers.
- - Describe cooling towers.
- - Explain the difference between evaporative condensers, air-cooled condensers, and water-cooled condensers.
- - Explain self-contained air conditioning units.
- - Define heat pumps.
- - Explain the direct use of evaporative cooling systems.
- - Describe refrigerators and freezers.
- - Describe the nature of fluid flow.
- - Explain reducing distribution system losses.
- - Explain reducing resistance to air movement.
- - Define fans.
- - Explain insulating air ducting.
- - Explain fluid flow in piping systems and insulating piping systems.
- - Explain balancing hydronic systems.
- - Define centrifugal pumps and explain how to maintain them.
- - Explain strainers in hydronic systems.
- - Define control valves, three-way control valves, and explain how to maintain control valves.

### TPC Industrial Fundamentals

#### *Unit: 101 Reading Blueprints*

##### Learning Objectives:

- - Identify details, markings, and machine parts from an assembly drawing
- - Identify an object from an orthographic drawing

- - Identify elements located within the title block of a detail drawing
- - Explain why more than one orthographic projection is needed to show an object on a blueprint
- - Describe what a machine is, and explain what it does
- - Name the two basic methods of joining machine parts
- - Name and identify from an exhibit several types of threaded fasteners
- - Name the two basic methods of permanent joining
- - Identify gears, bearings, and belt drives on drawings
- - Identify types of screw threads from a specification
- - Name the main parts of a lathe
- - State the definition of an exploded view
- - Identify as assembly drawing
- - Identify a compound rest swivel on an assembly drawing
- - Identify a specific part on an assembly drawing
- - Describe the difference among coils, strips, and sheet metal
- - Describe how a ventilation system works
- - State the purpose of an arrow on a duct symbol
- - Demonstrate how to lay out a development
- - Define a radial development of a truncated pyramid
- - Name building materials, given their standard symbols
- - Explain how to find useful information on a flow diagram
- - Explain how to find useful information on an industrial plant
- - List the contents of a set of building drawings
- - Describe the purpose of a structural drawing
- - Name the components represented by common symbols on hydraulic and pneumatic drawings
- - Name the components in a simple hydraulic power system
- - Name the components in a simple pneumatic power system
- - State Pascal's Law
- - Discuss the purposes of the components of hydraulic systems
- - State the definition of piping
- - Explain why joints are sometimes brazed instead of soldered
- - Explain how to assemble a screwed joint
- - Identify different types of pipe joints
- - Identify piping-system components shown in a single-line drawing
- - Define electrochemical corrosion
- - Identify different electrical symbols on a drawing
- - Identify the power distribution panels in your plant
- - Identify different types of conduit and cable



- - Select the best electrical drawing to use when looking for a faulty circuit between the basement and the first floor
- - Explain how electricity at 480 V is reduced by a transformer to 120/240 V
- - Define the terms voltage, current, and power
- - Explain how a refrigeration system works
- - Describe the types of air-conditioning controls
- - Name three kinds of condensers used in air-conditioning systems
- - Explain the difference between unitary and central air-conditioning equipment
- - Explain how to find useful information on a duct drawing
- - Name the four kinds of sketches
- - Identify an isometric sketch
- - Describe the appearance of a perspective drawing
- - Discuss how to sketch straight and curved lines
- - State the definition of a vanishing point

***Unit: 102 Reading Schematics and Symbols***

No Learning Objectives available.

***Unit: 103 Mathematics in the Plant***

No Learning Objectives available.

***Unit: 104 Making Measurements***

No Learning Objectives available.

***Unit: 105 Metals in the Plant***

No Learning Objectives available.

***Unit: 106 Non-Metals in the Plant***

No Learning Objectives available.

***Unit: 107 Hand Tools***

No Learning Objectives available.

***Unit: 108 Portable Power Tools***

No Learning Objectives available.

***Unit: 109 Industrial Safety and Health***

Learning Objectives:

- - Define the terms accident and hazard.
- - Name and define the four main types of hazards.
- - List and define various types of accidents.
- - Compare meanings of the terms unsafe act and unsafe condition.

- - Name the three ways in which a toxic substance can enter your body.
- - List ways in which a company must plan for emergencies.
- - Tell the main reason for prompt accident investigation.
- - State the purpose of the OSHA Act.
- - List the specific rights of employees under the Act.
- - Explain what to do in a dangerous work situation.
- - List things that you can do to help keep your workplace in compliance with OSHA standards.
- - Explain the function of each of the following agencies: NIOSH, EPA.
- - List the four main objectives of OSHA's Hazard Communication Standard.
- - Tell what information can be found on an SDS.
- - List employer and employee responsibilities related to PPE.
- - Tell why work clothing can be dangerous if it fits poorly.
- - Explain the importance of proper glove selection when handling chemicals.
- - Describe the proper fit of a hard hat.
- - Compare everyday eyeglasses, industrial safety glasses, and safety goggles.
- - Identify the noise level at which you must wear hearing protection.
- - Name the two basic kinds of respirators.
- - Define the terms chemical hazard, physical hazard, and health hazard.
- - Name three kinds of physical hazards.
- - Name and describe at least four kinds of health hazards.
- - Identify common symptoms of chemical exposure.
- - List three health hazard exposure routes.
- - Name three ways of controlling chemical hazards and exposures.
- - Explain first aid procedures to follow when you are exposed to a hazardous chemical.
- - Name at least three causes of hand tool accidents.
- - List one safety rule to follow when using each of the following: screwdriver, wrench, pliers, hammer, chisel, knife.
- - Describe proper and improper dress for working with rotating power tools.
- - Explain the importance of grounding electric tools.
- - Name two hazards involved in pneumatic tool use and explain how to guard against them.
- - Explain proper handling and storage of gasoline.
- - List simple safety procedures and precautions related to material handling.
- - Describe how to lift, carry, and put down a load.
- - Explain safety principles for working with or around industrial trucks.
- - Discuss safety rules for working with or around conveyors, slings, and hoists.
- - Describe how and where to store materials.

- - Identify a machine's point of operation and other pinch points, and explain why they are dangerous.
- - Identify different kinds of mechanical safeguards, and explain why they are necessary.
- - Define zero energy state.
- - Describe the lockout/tagout procedures established by the OSHA energy control standard.
- - Define the following terms: electric current, circuit, potential difference, ampere, watt, ohm, and volt.
- - State Ohm's Law.
- - Explain the function of each wire in a simple electric circuit and tell the color(s) used to identify each.
- - List the three factors that affect the severity of an electric shock.
- - Describe the effects of electric current on the human body.
- - Tell the three most important points about first aid for shock victims.
- - Explain how static electricity is generated, why its accumulation can be dangerous, and how it can be avoided.
- - Explain the importance of proper grounding.
- - Define the term "ground fault" and explain how ground faults occur.
- - Explain the purpose and operation of the following devices: GFCI, fuse, circuit breaker.
- - Identify typical hazardous electrical locations.
- - Explain the purpose of explosion-proof and intrinsically safe electrical equipment.
- - List at least two electrical safety rules in each of the following areas: clothing, equipment, water, lockout/tagout.
- - List and explain the four elements of the fire pyramid.
- - Name and give the definition of the five classes of fires.
- - Define the terms flash point and spontaneous combustion.
- - Name the fire-fighting agents, and explain how they work and when to use them.
- - Explain the use of at least two different types of portable fire extinguishers.
- - List three ways of preventing fires.
- - Explain fire hose and fire extinguisher maintenance.
- - Define ergonomics and tell how poor ergonomic conditions affect the body.
- - List three actions that you can take to protect your hearing.
- - Tell the cause of each of the following lung diseases: asbestosis, lung cancer, brown lung, black lung, silicosis.
- - Contrast ionizing and nonionizing radiation.
- - Compare and contrast personal and background sampling.
- - Explain the importance of protecting women from exposure to certain chemicals.
- - State the purpose of the EPA.
- - Explain the importance of industrial housekeeping.

- - List safety measures related to walkways, stairs, and floor openings.
- - Tell how to protect yourself and others when working in traffic paths.
- - Describe at least three hazards involved with each of the following and tell how to safeguard against them: working at elevations and working in confined spaces.
- - Calculate the proper placement of a straight ladder based on its working length.
- - Name two kinds of scaffolds and give at least one safety rule associated with each.
- - List symptoms of heatstroke, heat cramps, and heat exhaustion.
- - Name two major safeguards necessary when welding.
- - Explain how to handle and store cylinders safely.

#### ***Unit: 110 Troubleshooting Skills***

No Learning Objectives available.

#### ***Unit: 151 Chemical Hazards - OSHA's Hazard Communication Standard***

No Learning Objectives available.

#### **TPC Industrial Hydraulics**

#### ***Unit: 1001 Introductory - Industrial Hydraulics***

Learning Objectives:

- - Identify the various types of pumps and how they function
- - Understand applicable control mechanisms
- - Identify pump schematic symbols
- - Learn applied formulas
- - Identify the various types of hydraulic cylinders
- - Identify different types of hydraulic motors, how they function, and their associated schematic symbols
- - Become familiar with basic hydraulic formulas associated with calculating force and torque, as they relate to hydraulic actuators.
- - Identify the various types of hydraulic control valves and how they function
- - Understand applicable control valve circuits
- - Identify hydraulic valve schematic symbols
- - Identify the various types of modular valve applications, their functionality, and associated symbolism
- - Identify types of accumulators with their corresponding schematic symbol
- - Learn how an accumulator functions, their applicable applications, and basic accumulator maintenance requirements
- - Identify the various types of fluid conditioning components with their corresponding schematic symbol and to understand their proper applications

- - Understand terminology associated with fluid cleanliness, such as micron, beta ratio, and ISO code
- - Identify the various types of fluid power conductors and connectors and their application in working together to deliver fluid throughout the system
- - Describe the operating principles of limit switches and inductive, capacitive, ultrasonic, and photoelectric sensors
- - Understand fundamentals of proportional control
- - Identify the various types of proportional control valves and how they function
- - Understand applicable control valve circuits
- - Identify hydraulic valve schematic symbols

***Unit: 307 Basic Hydraulics***

No Learning Objectives available.

***Unit: 1002 Introductory - Mobile Hydraulics***

No Learning Objectives available.

***Unit: 346 - Tubing and Hose System Maintenance***

No Learning Objectives available.

***Unit: 308 Hydraulic Troubleshooting***

No Learning Objectives available.

**TPC Industrial Packaging**

***Unit: 311 Introduction to Packaging***

No Learning Objectives available.

***Unit: 312 Packaging Machinery***

No Learning Objectives available.

***Unit: 313 Casing Machinery***

No Learning Objectives available.

**TPC Machine Shop Practices**

***Unit: 315 Machine Shop Practices***

No Learning Objectives available.

***Unit: 316 Machine Shop Turning Operations***

No Learning Objectives available.

***Unit: 317 Machine Shop Shaping Operations***

No Learning Objectives available.

***Unit: 323 Machine Shop Job Analysis***

No Learning Objectives available.

***Unit: 324 Lathe-Turning Work Between Centers***

No Learning Objectives available.

***Unit: 325 Lathe-Machining Work in a Chuck***

No Learning Objectives available.

***Unit: 326 Basic Milling Procedures***

No Learning Objectives available.

***Unit: 327 Indexed Milling Procedures***

No Learning Objectives available.

***Unit: 328 Multiple-Machine Procedures***

No Learning Objectives available.

***Unit: 319 Equipment Installation***

No Learning Objectives available.

**TPC Maintenance Supervisor**

***Unit: 901 Maintenance Organization***

No Learning Objectives available.

***Unit: 902 Implementing Preventive Maintenance***

No Learning Objectives available.

***Unit: 903 Controlling Maintenance Resources***

No Learning Objectives available.

***Unit: 904 Improving Performance in Maintenance***

No Learning Objectives available.

***Unit: 905 Effective Communication for Supervisors***

No Learning Objectives available.

***Unit: 906 Employee Relations***

No Learning Objectives available.

***Unit: 907 Managing a Training Program***

No Learning Objectives available.

## TPC Mechanical Maintenance Applications

### *Unit: 341 Mechanical Drive Maintenance*

#### Learning Objectives:

- - List four types of chain drives.
- - Describe the procedure for aligning the driving and driven shafts.
- - Distinguish between bored sprockets and bushed sprockets and tell how each is mounted.
- - Tell how a drive chain is mounted on the sprockets.
- - List four methods of lubrication for chain drives.
- - Explain both no-load and full-load test running procedures.
- - Describe the causes of fatigue breaks, tensile breaks, rapid chain wear, roller wear, and side plate spreading.
- - List the three general types of belt drive and explain how they work.
- - Tell how sheaves and pulleys are mounted and aligned on their shafts.
- - Explain why all the belts in a multi-belt drive must be replaced at the same time.
- - Describe two ways of taking up slack in a stretched V-belt.
- - List three ways of splicing the ends of a flat belt together.
- - Differentiate between the way positive-drive belts and other types of belt transmit power.
- - Explain why open gearing requires special provisions for feeding lubricating oil to its parts.
- - Describe how to align parallel shafts, intersecting right-angle shafts, and nonintersecting right-angle shafts.
- - Describe the procedure for aligning worm gearing.
- - List some of the problems a visual inspection of gearing can uncover.
- - Describe the appearance and causes of wear, abrasion, corrosion, scoring, pitting, spalling, cold flowing, fatigue breaks, and cracked rims and webs.
- - Tell how an enclosed gear drive should be mounted on the floor.
- - Tell how an enclosed gear drive should be mounted on the framework of a driven machine.
- - Describe the two methods of lubrication used in enclosed gear drives.
- - Explain what should be done during the initial run-in, the one-week check, and the thirty-day check.
- - List four steps you should take to protect an enclosed gear drive that is to be put in storage.
- - Identify typical nameplate data.
- - List three purposes of a coupling.
- - List the three basic types of coupling.

- - Explain how to check both the angular and the parallel alignment of shafts.
- - Tell how a dial indicator is used in precision coupling alignment.
- - Calculate shim thickness required to align couplings in an angular plane.
- - Distinguish between couplings that need lubrication and those that do not.
- - Describe how shaft couplings, spacer couplings, floating shaft couplings, and universal joints are installed.

**Unit: 342 Mechanical and Fluid Drive Systems**

Learning Objectives:

- - Explain how friction-type and jaw-type clutches differ in construction.
- - Name the precautions that should be taken when mounting body on a shaft.
- - Explain how to test-run a mechanical clutch with no load.
- - Explain how to install a mechanical brake.
- - Describe the results of improper alignment between driving and driven shafts.
- - Identify the problems that may be indicated by chatter and excessive noise.
- - Describe how single-disc and multiple-disc friction clutches operate.
- - Explain how the principle of hysteresis is applied in electric clutches.
- - List the three basic components of magnetic particle clutch.
- - Differentiate between the static torque, pickup torque, and average torque of a clutch.
- - Identify the problems that may arise in a clutch if its heat is not dissipated.
- - Define decay time, pull-in time, and response time.
- - List the precautions necessary to provide extra protection for open-type drives.
- - Describe how to install an enclosed-type drive on a concrete floor.
- - Explain how to prepare the shafting when installing a new enclosed drive.
- - Describe the initial lubrication of new adjustable-speed drives.
- - Describe how to test-run an adjustable-speed drive under no load and full load conditions.
- - Name some of the safety rules for working on an adjustable drive.
- - Explain how a fluid drive works.
- - Describe how constant-speed couplings differ from variable-speed couplings.
- - Trace the fluid path through a torque converter using either a drawing or a cutaway.
- - Describe the various ways of mounting a fluid coupling.
- - Explain how to cool the fluid in large couplings.
- - Discuss preventive maintenance procedures for couplings.
- - List the components used in a typical drive system.
- - Name the part of a drive system in which most of the speed reduction occurs.
- - Describe the construction and operation of a shaft-mounted drive.
- - List the protective devices for a drive.
- - Explain the proper maintenance procedures for a drive system.



- - Describe the steps to be taken when troubleshooting a drive system.

### *Unit: 343 - Installing and Replacing Bearings and Shaft Seals*

#### Learning Objectives:

- - Name the important dimensions of a plain bearing.
- - State the source for learning the proper running clearance in a plain-bearing installation and describe how to measure running clearance.
- - State the characteristics of bearing and linear material and explain how they influence the choice of bearing for a given application.
- - Discuss the steps involved in fabricating a poured babbitt bearing liner and obtaining the correct finished-bore dimensions.
- - State the purpose and general principles of plain-bearing installation.
- - Identify the symptoms of bearing trouble and describe how to remedy each situation.
- - Describe proper procedures in handling, storing, cleaning, and inspecting antifriction bearings.
- - Explain how to measure, inspect, and condition a shaft bearing seat prior to installing a new bearing.
- - Tell where pressure should be applied to force a ball bearing on a shaft.
- - Name the two dimensions that are important in mounting a tapered-bore bearing on a shaft.
- - Describe the steps involved in correctly seating an antifriction bearing.
- - Describe the steps to take when using a hot-oil bath to heat a bearing for mounting.
- - Name the three major signals of bearing failure in antifriction bearings.
- - Describe the correct procedures for removing bearing seals and retaining devices from a bearing assembly.
- - Describe the impact bearing removal technique.
- - Explain how to use an aluminum heating ring to mount and dismount the inner ring of a cylindrical roller bearing.
- - Discuss the steps involved in inspecting and cleaning used bearings.
- - Describe the procedures for remounting sound used bearings.
- - Explain how to replace a shaft seal.
- - List the safety precautions that are essential to working with bearings.
- - Name the three major types of housings or mounts for bearings.
- - Name the major components of a mounted antifriction bearing.
- - Describe the two basic types of bearing seals and name the advantage of each.
- - List the different methods of securing insert bearings to the shaft and describe the mounting methods involved.
- - Discuss shaft alignment and describe bearing design factors that compensate for misalignment.

- - Explain why most bearing/shaft assemblies have one free and one fixed bearing.
- - List factors to consider when selecting bearing lubricants for pillow blocks.
- - Name the major components of a ball bearing screw.
- - Describe the major differences between a ball bearing screw and an acme screw.
- - Describe the main purpose of a ball bearing screw and give an example of a typical application.
- - Describe the installation procedures for a ball bearing screw.
- - Name the differences between contact and labyrinth seals and explain what creates the sealing action in each.
- - List the factors that determine the choice of shaft seal.
- - Describe how to install a lip seal on a shaft, including shaft preparation.
- - Name the major problem that arises with lip seals and list at least four conditions that can cause it.

**Unit: 344 - Pump Installation and Maintenance**

Learning Objectives:

- - Compute the amount of work done when giving values for force and distance.
- - Name the two types of energy.
- - Check a pump's capacity by determining the NPSHA of the system.
- - Compute the brake horsepower required to drive a pump under given conditions.
- - Explain how to prime a fluid-handling pump.
- - Identify the two major functions of packing and seals.
- - Explain the selection and installation of packing rings on a pump shaft.
- - Identify the components of typical mechanical seals.
- - Name at least three advantages of mechanical seals overpacking.
- - Describe how to install a mechanical seal on a pump shaft.
- - Discuss the care and maintenance of packing and seals.
- - Explain how to align and level a pump on its base.
- - Explain the needs for and uses of auxiliary pump drives.
- - Identify the major symptom of faulty packing.
- - Identify the major symptom of cavitation on a pump impeller.
- - Describe the procedures involved in disassembling, inspecting, reassembling, and reinstalling a centrifugal pump.
- - Explain how to check the runout of a pump shaft.
- - Explain how to check the clearances between stationary rings and the impeller or rotating rings.
- - Describe how to make a new housing gasket.
- - Identify the differences between the different types of rotary pumps.
- - Trace the path of fluid through a rotary pump.

- - Identify the major problem areas in a rotary pump.
- - Explain how to troubleshoot some of the common problems of rotary pumps.
- - Create a maintenance schedule for inspections and a record-keeping log.

#### *Unit: 346 - Tubing and Hose System Maintenance*

##### Learning Objectives:

- - Compare and contrast tubing and pipe.
- - List factors to be considered when selecting tubing for a specific application.
- - State a common application of various tubing materials.
- - Describe various fittings and tell how to select the proper fitting for a given tube.
- - Tell why is it sometimes necessary to anneal tubing.
- - List the steps to follow when cutting, sawing, and deburring tubing.
- - Explain how to calculate tubing length accurately.
- - List the steps involved in bending a given length of tubing.
- - Define the service conditions that must be taken into account when selecting tubing.
- - List the properties and typical uses of various types of fittings.
- - Explain the procedures involved in soldering and brazing.
- - Name several types of flaring tools and explain how they are used.
- - Explain how to install flared and flareless fittings.
- - Tell how and why tubing systems should be well supported.
- - List common causes of tubing system problems and their solutions
- - Explain the principles of force, pressure, and area as applied to hydraulics.
- - Discuss hydraulic fluids, hydraulic circuits, and hydraulic line components.
- - Explain how to select the proper tubing and fittings for hydraulic systems.
- - Describe maintenance and troubleshooting procedures for hydraulic tubing systems.
- - Discuss the three most common applications for hoses in industry.
- - Describe hose fitting classifications and installation techniques.
- - Explain how to calculate hose lengths for bends.
- - Describe the methods of testing, inspection, and maintaining hose.
- - Identify the types and uses of gasket materials.
- - Name the critical dimensions of a flanged pipe joint gasket.
- - List and explain the three characteristics of contact surfaces.
- - Explain the uses of gasket coatings, tapes, and strips.
- - Describe the application of sealants and adhesives in gasket joints.

#### *Unit: 347 - Valve Maintenance and Piping System Protection*

##### Learning Objectives:

- - Discuss the factors that affect the selection of valve materials.
- - Describe the various methods of connecting valves to piping.

- - Identify the various types of common valves and the operating characteristics of each.
- - Explain general maintenance and repair procedures for different types of valves.
- - Identify several types of special valves and the operating characteristics of each.
- - Discuss the installation, maintenance, and repair of special valves.
- - Explain the function and operation of a valve actuator.
- - Identify various types of valve actuators and describe the installation, maintenance, and repair of each.
- - Discuss the operating characteristics of various accessories, including gauges, meters, accumulators, and air receivers.
- - Name the five major uses of valves in piping systems and identify the types of valves best suited for each.
- - Identify and explain the factors that determine the selection of a valve for a given application.
- - Identify various valve markings and symbols.
- - Describe several types of valve-to-pipe connections.
- - Discuss the selection and proper use of tools in valve installations.
- - Explain the importance of the correct installation of valves in well-chosen locations.
- - Describe the methods by which heat transfer occurs.
- - Discuss the methods of tracing process lines.
- - Explain the various methods of protecting piping systems from heat, cold, and corrosion.
- - Discuss the installation, inspection, and maintenance of insulation and other forms of piping system protection.

### ***Unit: 345 Maintenance Pipefitting***

#### Learning Objectives:

- - State whether ID or OD identifies a give nominal pipe size.
- - Given a nominal pipe size and a copy of the American Standard Code for a Pressure Piping, find the wall thickness of a pipe of a given schedule number.
- - Name a least four kinds of pipe fittings
- - Given a schematic drawing of a piping system, identify all fittings used in the system.
- - Given a drawing showing three lengths of pipe with and without fittings installed, correctly name the application dimension for measuring the pipe length.
- - Given a schematic drawing showing two parallel horizontal pipe runs with a 45° run connection, identify the travel, set, and face-to-face length.
- - Given a descriptive number, identify the pipe size, thread type, and number of threads per inch on a threaded pipe.
- - Given a length of unthreaded pipe and required thread specifications, thread one end of the pipe to meet the specifications.

- - Given a length of threaded pipe and two threaded fittings, prepare the parts, apply the proper compound, and assemble the components.
- - State the important parts of a pipe thread.
- - Given actual dimensions for travel and set of a threaded pipe and fitting assembly, use established dimensional tables to compute the total length of replacement pipe needed.
- - Explain what steps to take to prepare lengths of pipe for butt and fillet welding.
- - Name the welding ring material used with stainless steel or nickel alloy piping.
- - Explain squareness and its importance in a welded piping system.
- - Name the major assembly considerations when fabricating flanged connections for a rolling offset installation.
- - Given a schematic drawing of this installation, compute the hole compensation angle to be used when positioning the flange for welding.
- - Name at least one accessory used to help align two sections of pipe for welding.
- - Given a length of pipe and a slip-on flange with a raised face, align and weld the pipe and flange.
- - Name the materials used for plastic pipes and fittings.
- - Name at least one advantage of plastic piping.
- - Name the two most common materials used to make thermosetting plastic pipe.
- - Given two lengths of thermosetting plastic pipe, demonstrate how to join them with a bell and spigot joint.
- - Name at least one limitation of plastic piping.
- - Demonstrate how to align and install fittings on a length of plastic pipe.
- - Name the three classes of piping supports and hangers.
- - Explain which two types of pipe hangers are most often used to reduce line vibration and shock.
- - Explain the factors to be considered when installing pipe hangers for different applications.
- - Name the piping system components used to compensate for pipe length changes due to temperature changes.
- - Explain the factors to be considered when locating (spacing) pipe hangers in a system.
- - Name two types of steam traps and identify the major consideration in locating them.
- - Explain the purpose of a line filter.

### TPC Mechanical Systems

#### *Unit: 301 Basic Mechanics*

No Learning Objectives available.

#### *Unit: 302 Lubricants and Lubrication*

No Learning Objectives available.

***Unit: 303.1 Power Transmission Equipment***

No Learning Objectives available.

***Unit: 304 Bearings***

No Learning Objectives available.

***Unit: 305 Pumps***

No Learning Objectives available.

***Unit: 306 Piping Systems***

No Learning Objectives available.

***Unit: 307 Basic Hydraulics***

No Learning Objectives available.

***Unit: 308 Hydraulic Troubleshooting***

Learning Objectives:

- - Name the six basic elements of a hydraulic system.
- - Explain the functions of hydraulic pumps, actuators, control valves, conductors and connectors, hydraulic fluid, and fluid storage and conditioning equipment.
- - Describe how to trace a system.
- - Name three basic types of hydraulic diagrams, and explain the purposes of each.
- - Describe how a valve symbol is constructed.
- - List the steps to follow when reading a schematic diagram.
- - Identify common hydraulic symbols.
- - Explain the importance of cleanliness in hydraulic installations.
- - Describe possible consequences of neglecting safety precautions.
- - Explain how motor and pump shafts are aligned before coupling.
- - Explain the correct method for checking direction of pump rotation.
- - List several useful hints for solenoid valve installation.
- - Explain how pipe sizes are specified.
- - Name the common types of pipe joints.
- - List six important rules for good piping installation.
- - Describe the advantages of hydraulic tubing over pipes.
- - Describe the correct methods for bending and flaring tubing.
- - List the key points for correctly installing hydraulic hoses, seals, reservoirs, filters, and actuators.
- - List ten important properties of hydraulic fluids.
- - Explain the difference between hydrodynamic and boundary lubrication.
- - Explain what a fluid's viscosity index means.

- - Define demulsibility and emulsibility.
- - Describe how to read a viscosity-temperature chart.
- - List the proper procedures for installing hydraulic fluid.
- - List the major categories of hydraulic system maintenance.
- - Name and describe the six essential items in a maintenance file.
- - List the steps involved in reconditioning a hydraulic component.
- - Explain how to set up a maintenance plan for a typical hydraulic system.
- - Describe the troubleshooting process.
- - Explain how to evaluate recent maintenance history.
- - List typical symptoms of common hydraulic system problems.
- - Explain how to determine the cause of and provide a solution to a problem.
- - Explain how a portable tester works.
- - Describe how to keep and use troubleshooting charts.
- - Name five common valve problems and explain the sequence of steps to be followed in trouble-shooting them.
- - Describe the proper procedures for valve dis-assembly, cleaning, and inspection.
- - Explain how to determine whether to repair or replace a malfunctioning valve.
- - Describe the reasons for hydraulic “wire drawing.”
- - List the reasons for electrical and mechanical failures of solenoid valves.
- - Explain the procedures for reassembling, reinstalling, and testing valves.
- - Name the most common types of hydraulic cylinders and identify their major parts.
- - List the symptoms of internal and external cylinder misalignment.
- - Explain what to do if you find internal leakage in a cylinder.
- - Name the cylinder components most frequently replaced.
- - Explain the purpose of a piston rod boot.
- - Describe the symptoms of shock absorber failure.
- - List the proper procedures for troubleshooting pumps and motors.
- - Name some common causes of pump failure.
- - Describe typical causes of cavitation.
- - Discuss the major sources of problems in gear pumps and vane pumps.
- - Describe the effects of contaminants in axial-piston and radial-piston pumps.
- - Explain the differences between a vane motor and a vane pump.

***Unit: 309 Basic Pneumatics***

No Learning Objectives available.

***Unit: 310 Pneumatic Troubleshooting***

No Learning Objectives available.

## TPC Pneumatics

### *Unit: 1003 Introductory - Pneumatics*

#### Learning Objectives:

- - Understand the basic physics of energy, work, and power, as it applies to pneumatics.
- - Understand the gas laws, flow and pressure application, and the basic components that make up a pneumatic system
- - Understand the basic physics, as it relates to compressed air, including how it is compressed, stored and cooled
- - Understand the different types of compressors and related devices used in air compression and their graphic symbols
- - Understand air preparation and conditioning components, illustrating their functionality and application
- - Recognize air preparation and conditioning components corresponding graphical symbols
- - Understand the various types of air line conductors, including steel pipe, copper tubing, and plastic tubing
- - Understand air line conductors different applications and how they link together to form an air line distribution network
- - Identify the various types of pneumatic actuators, how they function, and their associated schematic symbols
- - Understand basic pneumatic formulas associated with calculating force and torque, as related to pneumatic actuators
- - Identify the various types of pneumatic control valves and their associated graphic symbols. You will also learn how the valves function and their associated applications.
- - Understand the basic physics of vacuum and how it is applied in a pneumatic vacuum control system
- - Understand vacuum control components, such as vacuum generators, vacuum pumps and gripper cups and learn the graphic symbol representation of each component

### *Unit: 309 Basic Pneumatics*

No Learning Objectives available.

### *Unit: 310 Pneumatic Troubleshooting*

#### Learning Objectives:

- - Explain the operation of linear actuators (cylinders) in a typical pneumatic circuit.
- - Describe the various types of compressors and how they work.
- - Define intercooling and aftercooling.
- - Describe basic preventive maintenance procedures for compressors.



- - List the components of an effective delivered-air system and explain how they work together.
- - Describe the three main types of air-line lubrication.
- - Explain the different types of symbols used in pneumatic schematic diagrams—how they are constructed and what they show.
- - Describe the operation of timing and safety circuits.
- - Analyze the schematic diagram of a fluid-power system.
- - Describe the proper installation of the compressor and its auxiliaries.
- - Describe the installation of aftercoolers, receivers, and dryers.
- - Explain the correct procedures for installing pipes, tubes, and hoses in pneumatic systems.
- - Describe the installation of control valves, solenoid coils, and cylinders.
- - Explain the concept of planned maintenance.
- - Describe the basic procedures for maintaining the compressor and other important components in a pneumatic system.
- - Describe the maintenance of industrial control circuit components.
- - Explain the proper maintenance of pneumatic tools.
- - Discuss the various types of maintenance logs and explain what kind of information is recorded in each.
- - List, in proper sequence, the steps to be taken in troubleshooting a pneumatic system.
- - Name and describe the five important parts of every pneumatic system's operations manual.
- - Describe procedures for troubleshooting an actuator.
- - Explain how to check control valves, sequence valves, and interlocks.
- - Describe methods of cooling and lubricating reciprocating compressors.
- - Explain the proper maintenance of compressor valves.
- - Identify problems associated with the control system of a compressor.
- - Describe the basic maintenance requirements of rotary, vane, rotary-screw, and centrifugal compressors.
- - Outline how to isolate a control malfunction in a pneumatic circuit.
- - Explain how to troubleshoot a nonstarting or nonoperating circuit, improper sequencing of the circuit, and miscellaneous problems related to the equipment.
- - Describe the proper procedures for checking electric solenoids.
- - Explain how to check for problems related to valve shifting, control timing, and lubrication.
- - Define the different types of pneumatic cylinders.
- - Describe the construction of a typical cylinder.
- - Describe the proper procedures for troubleshooting cylinders, including checking for misalignment, worn packings, and adequate air pressure.

- - Explain general installation techniques for cylinders and accessories.
- - Explain how to check for sufficient clean air when troubleshooting an inoperative air motor.
- - Explain how to keep hoses, clamps, and couplings in good condition.
- - Describe the operation and maintenance of vane, radial piston, and axial-piston air motors.
- - Explain why and how compressed air and hydraulic pressure are combined.
- - Describe the role of boosters in pneumatic/hydraulic systems.
- - Explain how single-pressure and dual-pressure booster systems work.
- - Describe the advantages and disadvantages of combined air-oil cylinders.
- - Explain how pneumatic and hydraulic actions can be interlocked.
- - Discuss the proper troubleshooting procedures for air-oil systems.

### TPC Power Plant

#### *Unit: 111 How Power Plants Work*

##### Learning Objectives:

- - Describe the basic concepts involved in converting energy to electricity through a steam power plant.
- - Explain why air is important in combustion and describe how air is heated.
- - Describe the basic design of a boiler.
- - List the methods commonly used to create efficiency in a boiler.
- - Describe the components of an elementary turbine.
- - List the uses of exhaust steam.
- - Explain how a vacuum is produced in a boiler system.
- - Describe how condensate is formed in a boiler system and how it can be used to create a closed cycle system.
- - Explain how boiler efficiency is related to steam temperature and pressure.
- - Calculate absolute temperature values using Fahrenheit and Celsius readings.
- - List the kinds of pumps used in a boiler system and explain the function of each.
- - Describe the common processes by which boiler feedwater can be heated, and explain how such processes increase boiler efficiency.
- - Explain the process by which air is heated in a boiler system.
- - Explain the purpose of a superheater.
- - List the two main uses for water in a power plant.
- - Describe the physical and chemical properties of water.
- - Explain the past and present methods used to purify water for use in a power plant.
- - Explain the common handling procedures for flue gases and solid wastes, and describe the problems involved in disposing of these wastes.

- - List some of the ways in which power plant waste problems might be resolved in the future.
- - Give a detailed description of the arrangement of a modern steam generating plant and explain the progression of the steam cycle from one end to the other.
- - Compare and contrast the common instruments for measuring temperature.
- - Compare and contrast the common instruments for measuring pressure.
- - List some of the special measurement devices that are important in a steam generating plant.
- - List the alternate power sources described in the lesson.
- - Explain the concept of nuclear power and describe the operation of a nuclear power plant.

***Unit: 112 Generating Steam in the Power Plant***

No Learning Objectives available.

***Unit: 113 Using Steam in the Power Plant***

Learning Objectives:

- - Name the five main parts of a steam turbine system and explain the function of each.
- - Contrast the operating principle of an impulse turbine and a reaction turbine.
- - Define the terms tandem compound and cross compound.
- - Explain how a condenser improves turbine efficiency.
- - Explain how an overspeed trip is activated.
- - List three causes of turbine rotor vibration.
- - Name the main cause of bearing failure in a turbine.
- - Define the term variable.
- - Describe the three main classes of boiler instruments.
- - List the four variables on which boiler instrumentation usually provides data.
- - Name the four common types of pressure gauges, and describe the characteristics and uses of each.
- - Name and describe the three types of flowmeters commonly used in power plants.
- - Name and describe the four types of temperature gauges commonly used in power plants.
- - Describe the uses for gauge glass assemblies in power plant instrumentation.
- - Explain the purpose of combustion control systems and describe the three basic kinds.
- - Describe the three kinds of feedwater regulators.
- - Explain the importance of safety valves and flame safety devices in power plants.
- - Explain the basic principles of electricity and electric power, including the significance of Ohm's Law
- - Identify the parts of an electrical circuit and describe the function of each part

- - Contrast series and parallel circuits
- - Explain the difference between the two main groups of generators and further describe each group in terms of its sources of mechanical power
- - Define phase difference and power factor, and describe a three-phase system
- - Explain the function of a transformer
- - Describe the variety of metering instruments used to measure the value of electric energy
- - Explain the purpose of an electric distribution system, and list the three main kinds
- - Name four kinds of protective equipment used in power systems
- - Explain the purpose of a line diagram.
- - List the four kinds of charges normally found on a power bill.
- - Define peak demand.
- - Calculate a plant's load factor.
- - Describe the steps involved in performing demand analysis.
- - Calculate demand cost and explain the effect of short demand peaks on billing.
- - Define power factor and explain how it is calculated, what causes it to be low, and how it can be improved.
- - List the types of power losses that occur in transformers and describe the cause of each.
- - Explain how to maintain protective devices, cable systems, and generators and motors.
- - Explain the importance of energy conservation in power plants.
- - Define relative humidity and explain how it is measured
- - Define the terms refrigeration ton and refrigeration effect
- - Name and describe the three common kinds of compressors used in air-conditioning systems
- - Name and describe the three kinds of condensers used in air-conditioning systems
- - List the metering devices used in an air-conditioning system and explain their uses
- - List the accessories and controls that are found in an air-conditioning system and state their purposes
- - Describe the air-handling system and its components
- - Explain how to measure velocity pressure and static pressure
- - Explain several maintenance practices that will improve the efficiency of an air-conditioning system.

***Unit: 303.1 Power Transmission Equipment***

No Learning Objectives available.

***Unit: 114 Waste-to-Energy Fundamentals***

No Learning Objectives available.

## TPC Process Control Instrumentation

### *Unit: 271 Introduction to Process Measurement and Control*

No Learning Objectives available.

### *Unit: 273 Pressure Measurement*

No Learning Objectives available.

### *Unit: 274 Force, Weight, and Motion Measurement*

No Learning Objectives available.

### *Unit: 275 Flow Measurement*

No Learning Objectives available.

### *Unit: 276 Level Measurement*

No Learning Objectives available.

### *Unit: 277 Temperature Measurement*

No Learning Objectives available.

### *Unit: 278 Analytical Instrumentation*

No Learning Objectives available.

### *Unit: 279 Final Control Elements*

No Learning Objectives available.

### *Unit: 280 Safety, Calibration, and Testing*

No Learning Objectives available.

## TPC Process Control Systems

### *Unit: 281 Working with Controllers*

No Learning Objectives available.

### *Unit: 282 How Control Loops Operate*

No Learning Objectives available.

### *Unit: 283 Data Transmission*

No Learning Objectives available.

### *Unit: 284 Computers in Process Control*

No Learning Objectives available.

## TPC Waste Water Treatment

### *Unit: 381 Introduction to Water Technology*

#### Learning Objectives:

- - Describe the water cycle.
- - Define precipitation.
- - Describe surface runoff.
- - Define groundwater.
- - Describe how we use water.
- - Explain municipal use.
- - Explain industrial use.
- - Explain agricultural use.
- - Explain waste disposal.
- - Explain waste not - want not.
- - Describe the beginning of waterworks.
- - Describe Roman waterworks.
- - Describe centuries of neglect.
- - Describe the beginning of water treatment.
- - Describe how we are upgrading water today.
- - Describe collecting surface water.
- - Describe collecting ground water.
- - Explain transmission of water.
- - Explain why we treat the supply water.
- - Describe types of treatment.
- - Explain treatment in the treatment plant.
- - Explain distributing treated water.
- - Describe collecting wastewater.
- - Describe treating wastewater.
- - Describe primary treatment.
- - Describe secondary treatment.
- - Describe tertiary treatment.
- - Explain why grit removal is important.
- - Name the three phases of the grit removal process.
- - Explain the functions of slide gates and dewatering drains in handcleaned grit chambers.
- - Describe the action of a reciprocating rake and explain its purpose.
- - List several maintenance checks to make on chain and flight grit collectors.
- - Explain how an aerated grit chamber works and how to tell if it is not working correctly.

- - Describe the operation of a cyclone grit separator.
- - Explain atoms and molecules of water.
- - Explain acids, bases, and salts.
- - Explain the ionization of water.
- - Define alkalinity.
- - Define acidity.
- - Explain the hardness of water.
- - Describe other unwanted chemicals.
- - Describe dissolved oxygen.
- - Explain pathogenicity.
- - Explain disinfection.
- - Explain the stabilization of organic matter.
- - Explain the biochemical oxygen demand.
- - Explain factors affecting growth.
- - Describe the food chain.
- - Explain the types of living things.
- - Define bacteria.
- - Define the environmental classifications of bacteria.
- - Explain bacteria in treatment plants.
- - Define viruses.
- - Define algae and protozoa.
- - Define higher organisms.

***Unit: 383 Maintaining Wastewater Equipment***

Learning Objectives:

- - Describe a typical collection system layout.
- - Name the three types of pumping stations currently in use and explain how they differ.
- - Use the following terms in an explanation of pump operation: impeller, shroud, volute case, stuffing box, shaft sleeve, wearing ring.
- - Name the importance of a pump station ventilation system.
- - Demonstrate the necessary procedures to follow before pump start-up.
- - Name the two basic parts of a hand-cleaned bar screen and explain their functions.
- - Describe the operation of a mechanically cleaned bar screen.
- - Explain why grinders are used and how they are maintained.
- - Compare and contrast a rotating drum comminutor and a stationary screen comminutor with an oscillating cutter.
- - Explain how a barminutor combines the functions of a bar screen and a comminutor.
- - Give examples of important safety rules to follow when working with screening and grinding equipment.

- - Tell why grit removal is important.
- - Name the three phases of the grit removal process.
- - Explain the functions of slide gates and dewatering drains in handcleaned grit chambers.
- - Describe the action of a reciprocating rake and explain its purpose.
- - List several maintenance checks to make on chain and flight grit collectors.
- - Explain how an aerated grit chamber works and how to tell if it is not working correctly.
- - Describe the operation of a cyclone grit separator.
- - List the five major components common to all clarifiers.
- - Describe the operation of slotted-pipe and helicaltype skimmers.
- - Name the two flow patterns possible in circular clarifiers.
- - Discuss the daily maintenance requirements of clarifiers.
- - Explain the importance of laboratory testing on the contents of a clarifier.
- - Identify possible safety hazards associated with clarifier operation.
- - Define flow and differentiate between flow rate and total flow.
- - List the three basic types of flow systems.
- - Distinguish between direct and indirect flow measurements, and between primary and secondary devices.
- - Give a brief description of a current meter, a pitot tube, a weir, and a flume, and tell how each functions in open channels.
- - Describe several methods of measuring flow from freely discharging pipes.
- - Name at least five level detection devices and explain their operation.
- - Describe the following flow measurement devices as they are used in completely filled pipes: orifice, venturi, flow nozzle, rotameter, magnetic flowmeter, and ultrasonic flowmeter.

#### ***Unit: 382 Wastewater Treatment Processes***

##### Learning Objectives:

- - Explain the purpose of treatment.
- - Name sources of wastewater.
- - Describe wastewater collection systems.
- - Describe typical treatment facilities.
- - Explain influent.
- - Explain preliminary treatment.
- - Explain secondary treatment.
- - Explain tertiary treatment.
- - Describe disinfection and effluent discharge.
- - Explain solids handling.



- - Explain the screening process.
- - Explain the grinding process.
- - Explain grit removal.
- - Explain primary sedimentation.
- - Explain what happens during sedimentation.
- - Describe factors affecting settling rates.
- - Name the types of clarifiers.
- - Explain air flotation.
- - Explain filtration.
- - Describe effluent disposal.
- - Classify solids in wastewater.
- - Describe chemical coagulants.
- - Explain phosphate removal.
- - Name chemical clarification equipment.
- - Explain disinfection.
- - Name factors affecting disinfection.
- - Describe disinfection with chlorine.
- - Describe equipment used in chlorine feeding.
- - Explain lagoons.
- - Explain activated sludge.
- - Explain aeration with pure oxygen.
- - Describe trickling filters.
- - Describe distribution systems.
- - Explain trickling filter operations.
- - Describe synthetic media.
- - Describe the activated biofilter process (ABF).
- - Describe the rotating biological contactors (RBC).
- - Explain secondary clarifiers.
- - Explain the three processes.
- - Describe sludge conditioning.
- - Describe thickening.
- - Describe dewatering.
- - Explain drying beds.
- - Explain vacuum filtration.
- - Describe filter presses.
- - Describe the further reduction of water content.
- - Explain composting.
- - Explain ultimate disposal.

## WorkForge

### Aircraft Familiarization

#### *Unit: AER-1001 The History of Aviation*

Learning Objectives:

- - Identify the key milestones in aviation history

#### *Unit: AER-1002 Primary Assemblies of an Aircraft*

Learning Objectives:

- - Identify the primary assemblies of an airplane
- - identify the components of each of the primary assemblies
- - Explain how the primary assemblies work together

#### *Unit: AER-1003 Principles of Flight*

Learning Objectives:

- - Identify the four forces that act upon an aircraft
- - Explain the impact of atmospheric pressure on an airplane
- - Explain the principles of lift
- - Explain the function of an airfoil

#### *Unit: AER-1004 Airplane Control*

Learning Objectives:

- - Identify the three axes of control
- - Explain the center of gravity of an airplane
- - Identify the control systems of an airplane
- - Identify the nine type of stability

#### *Unit: AER-1005 Aircraft Configuration*

Learning Objectives:

- - Identify airplanes based on their commercial purpose
- - Identify airplanes based on their wing location
- - Identify airplanes based on their tail configuration
- - Identify airplanes based on their engine type and location
- - Explain the advantages of each configuration

#### *Unit: AER-1006 Aircraft Materials*

Learning Objectives:

- - Identify the types of materials used in aircraft construction
- - Identify the properties of each material
- - Understand the process of selecting the proper materials
- - Explain the strengths and weaknesses of each type of material

#### ***Unit: AER-1007 Aircraft Construction***

Learning Objectives:

- - Identify the major types of aircraft construction
- - identify the components of an airframe
- - Identify the construction methods used in aircraft manufacturing

#### ***Unit: AER-1008 Aircraft Corrosion***

Learning Objectives:

- - Define corrosion
- - Explain the corrosion process
- - Identify the conditions that must exist for corrosion to occur
- - Recognize different types of corrosion
- - Identify common corrosive agents
- - Identify metals that are subject to corrosion
- - Identify preventative measures for corrosion

#### ***Unit: AER-1009 Aircraft Regulations***

Learning Objectives:

- - Define the purpose of regulations
- - Identify why aviation is regulated
- - Recognize different regulatory bodies and their roles in aviation
- - Identify the culture and behavior of regulation
- - Define the purpose of inspection in the aviation industry
- - Identify customer expectations

#### **CNC Machining Center Operator - Level 1**

##### ***Unit: CNC-2009 The CNC Controller for a CNC Machining Center***

Learning Objectives:

- - Identify the five main areas of the CNC controller
- - Describe how the operator controls work
- - List the areas of the display screen
- - List the areas of the keyboard

- - Describe how the Shift key works
- - Describe the side panel controls

***Unit: CNC-2008 Workpiece and Tool Holding Devices for a CNC Machining Center***

Learning Objectives:

- - Identify common workholding devices
- - List the components of a vise
- - List the components of a fixture
- - List the components of a tool holder
- - Describe how an automatic tool change occurs

***Unit: CNC-2010 Auxiliary Systems for a CNC Machining Center***

Learning Objectives:

- - Describe how the lubrication system works
- - Describe how the coolant system works
- - Describe how the chip removal system works

***Unit: CNC-4015 Maintenance Tasks for a CNC Machining Center***

Learning Objectives:

- - Check the coolant level
- - Fill the coolant tank
- - Check the air pressure
- - Check the level of lubricating oil
- - Check the level of grease

***Unit: CNC-2007 CNC Machining Center Movements***

Learning Objectives:

- - Define movements on the Z-axis
- - Define movements on the Y-axis
- - Define movements on the X-axis
- - Describe the machine coordinate system
- - Define machine home
- - Describe the part coordinate system
- - Define part zero
- - Describe how ordered triplets are used to define the geometry of a part

***Unit: CNC-2011 CNC Machine Lubricants***

Learning Objectives:

- - Distinguish between lubricating oils and greases
- - Identify advantages of grease over lubricating oil
- - Identify ingredients in lubricating oil and grease
- - Define viscosity

#### ***Unit: CUT-2008 Cutting Fluids***

Learning Objectives:

- - Distinguish between cutting oil, soluble oil, and synthetic cutting fluids
- - List properties of cutting oils
- - List properties of synthetic cutting fluids
- - List properties of soluble oil
- - List ingredients in soluble oils
- - Understand how to use a refractometer

#### ***Unit: NDE-3038 The NDE Process***

Learning Objectives:

- - Define terminology used in the field of NDE
- - Describe where NDE is used
- - Describe different methods of NDE
- - Describe the NDE process

#### **Introduction to Logistics**

##### ***Unit: [LOG01] What is Logistics?***

Learning Objectives:

- - Identify key accomplishments in the history of logistics
- - Identify the main types of logistics
- - Describe the fundamental tasks associated with logistics
- - List the top logistics companies in Indiana
- - Define logistics

##### ***Unit: [LOG02] Logistics Technology***

Learning Objectives:

- - Differentiate among the various technologies that enable and support material handling
- - Differentiate among the various technologies that enable and support supply chain management
- - Identify the main categories associated with material handling

***Unit: [LOG03] Inventory***

Learning Objectives:

- - Describe what inventory is and its importance
- - Define lead time and its effect on inventory
- - Determine the appropriate amount of inventory needed based on the situation
- - Define Just-In-Time inventory
- - Differentiate among the three types of inventory costs
- - Describe how inventory management works
- - Identify different types of inventory packaging

***Unit: [LOG04] Distribution and Transportation***

Learning Objectives:

- - Define product distribution and describe its importance
- - Define warehousing and describe its role in supply chain management
- - Identify steps involved in order processing
- - Define material handling systems and describe how they function
- - Identify different modes for transporting goods

***Unit: [LOG05] Safety, Quality and the Environment in Logistics***

Learning Objectives:

- - Describe the importance of safety and safety education in logistics
- - Define quality as it relates to logistics
- - Describe and define "green logistics"

***Unit: [LOG06] Winning in Logistics***

Learning Objectives:

- - List the main elements that can help a logistics company "win"
- - Understand how costs help determine a logistics company's success
- - Recognize logistics teamwork strategies
- - Explain how delivery, safety, environment and customers influence success

***Unit: [LOG07] Careers in Logistics***

Learning Objectives:

- - Identify teams that work together in the logistics world
- - Articulate the overall mission of a team
- - Describe various roles and responsibilities within logistics teams
- - Describe how teams and individuals work together to prepare products for delivery

## Introduction to Manufacturing Careers - Level 1 - WorkForge

### *Unit: MFG-1007 Careers in Manufacturing*

Learning Objectives:

- - Identify teams that work together in the advanced manufacturing world
- - Articulate the overall mission of a team
- - Describe various roles and responsibilities within advanced manufacturing teams
- - Describe how teams and individuals work together to manufacture quality products

### *Unit: MFG-1002 Manufacturing History and Technology*

Learning Objectives:

- - Explain events that influenced manufacturing throughout history
- - List software technologies designed to help in the manufacturing process
- - List manufacturing hardware that is used in modern advanced manufacturing
- - Describe how connectivity on the macro and micro levels affects advanced manufacturing

### *Unit: MFG-1001 What is Advanced Manufacturing?*

Learning Objectives:

- - Define advanced manufacturing
- - Identify things you use in your life that are manufactured
- - List the top manufacturing industries in the United States
- - List the top manufacturing industries in Indiana

### *Unit: AUT-1001 Introduction to Automation*

Learning Objectives:

- - Understand the role and importance of automated processes
- - List the power sources of some automated processes
- - Identify different types of components used in pneumatic/electro-pneumatic installations or circuits

### *Unit: ROB-1001 Introduction to Robotics*

Learning Objectives:

- - List common tasks of industrial robots
- - Distinguish between the types of industrial robots
- - Understand the history of industrial robots

***Unit: SAF-1001 Introduction to OSHA***

Learning Objectives:

- - Describe OSHA's role in workplace safety
- - Know who OSHA does and does not cover
- - List employee and employer rights under OSHA
- - Understand what an OSHA standard is

***Unit: CNC-1001 Introduction to Machining***

Learning Objectives:

- - Identify different classifications of tools
- - List methods of removing metal
- - List methods of shaping metal
- - List common machining operations

***Unit: QUA-1001 Introduction to Quality***

Learning Objectives:

- - Define quality, customer, and expectations
- - Identify the source of expectations
- - define quality management systems
- - Describe the history of quality management systems
- - Define Total Quality Management (TQM)
- - List the principles of TQM
- - Identify who is involved in quality
- - Give examples of how customers and companies benefit from quality systems

***Unit: WEL-2001 Introduction to Welding***

Learning Objectives:

- - Identify weld discontinuities
- - List the basic arc welding process
- - Identify joints and associated weld types
- - Understand weld and welding symbols

***Unit: NDE-3003 Careers in NDE***

Learning Objectives:

- - Distinguish between qualification and certification
- - List the two practices of certifying NDE technicians
- - List common levels of NDE technicians



- - Understand the training and work experience requirements for the various levels and NDE methods
- - List common aerospace standards that recommend the training and work experience requirements

***Unit: PLC-1002 Introduction to Digital Electronics***

Learning Objectives:

- - Define digital electronics
- - Identify the number systems used by PLCs
- - Identify the data types used by PLCs
- - Identify and define the logic gates used in PLC programming
- - Understand how logic gates function
- - Identify the symbols for logic gates

***Unit: ELE-1001 Production of Electricity***

Learning Objectives:

- - Understand the term energy
- - List methods to produce electricity
- - Understand the concept of conservation of energy
- - List several forms of energy
- - Understand the difference between kinetic and potential energy

***Unit: AER-1001 The History of Aviation***

Learning Objectives:

- - Identify the key milestones in aviation history

***Unit: LOG-1001 What is Logistics?***

Learning Objectives:

- - List the top logistics companies in Indiana
- - Describe the fundamental tasks associated with logistics
- - Identify the main types of logistics
- - Identify key accomplishments in the history of logistics
- - Define logistics

***Unit: LOG-1007 Careers in Logistics***

Learning Objectives:

- - Identify teams that work together in the logistics world
- - Articulate the overall mission of a team

- - Describe how teams and individuals work together to prepare products for delivery
- - Describe various roles and responsibilities within logistics teams

**Unit: PRO-1001 What is Project Management**

Learning Objectives:

- - Define the terms project, project management, and project manager
- - Describe the key duties of a project manager
- - Explain the importance of project management training
- - List some common reasons why projects fail

**Introduction to Manufacturing Careers - Level 2 - WorkForge**

**Unit: LEA-1001 Lean Principles**

Learning Objectives:

- - Define and describe the concepts of lean, including pull and perfection
- - Define and describe the elimination of waste using tools like 5S, kaizen, and poke-yoke
- - Use a value stream map to identify waste
- - Explain value
- - Define value, value-added, and non-value-added
- - Identify the terms used to describe waste
- - Describe the theory of constraints

**Unit: HYD-1001 Introduction to Hydraulics**

Learning Objectives:

- - Understand fluid power
- - Define hydraulics
- - Describe the differences between hydrostatic and hydrodynamic systems
- - List the advantages of a fluid power system
- - Identify the basic components of a fluid power system
- - Compare a hydraulic and pneumatic system
- - Compare four different types of power systems

**Unit: MAT-2001 Introduction to Metals**

Learning Objectives:

- - Identify metal products
- - Recognize a periodic table and the metals, nonmetals, and metalloids classifications
- - Define metals, nonmetals, and metalloids
- - Describe and compare the properties of metals, nonmetals, and metalloids

- - Explain that metal, nonmetal, and metalloid elements can be combined to form metal alloys
- - Explain why machinability is important
- - Describe the mechanical properties of metals, including strength, toughness, ductility, malleability, brittleness, and hardness
- - Identify and compare methods of testing hardness
- - Describe and compare how metal parts are formed and how mechanical properties affect metal forming

***Unit: PNE-1001 Introduction to Pneumatics***

Learning Objectives:

- - Define pneumatics
- - Define compressed air
- - List the advantages of compressed air
- - Explain the importance of pneumatics in automation
- - List industrial and commercial applications where pneumatics are used
- - Explain the historical evolution of compressed air technology

***Unit: ADM-1002 Introduction to 3D Metal Printing***

Learning Objectives:

- - Define metal 3D printing
- - Discuss the advantages of 3D printing
- - Describe the forms of metal material used in 3D printing
- - Briefly describe each classification of 3D printing
- - List the products made by metal 3D printing

***Unit: LOG-1002 Logistics Technology***

Learning Objectives:

- - Differentiate among the various technologies that enable and support material handling
- - Differentiate among the various technologies that enable and support supply chain management
- - Identify the main categories associated with material handling

***Unit: AER-1002 Primary Assemblies of an Aircraft***

Learning Objectives:

- - identify the components of each of the primary assemblies
- - Explain how the primary assemblies work together

- - Identify the primary assemblies of an airplane

***Unit: MTC-1001 Introduction to Abrasive Waterjet Cutting***

Learning Objectives:

- - Define abrasive waterjet cutting
- - Describe the equipment needed for abrasive waterjet cutting
- - Explain the process of abrasive waterjet cutting
- - List products made by abrasive waterjet cutting

***Unit: MTF-1001 Introduction to Metalworking Processes***

Learning Objectives:

- - Define metalworking
- - List the three categories of metalworking processes
- - Understand the skills needed to be successful in metalworking
- - Explain safety precautions when metalworking

***Unit: PLC-1001 Introduction to Programmable Controllers***

Learning Objectives:

- - Describe the historical evolution of programmable controllers
- - Understand the role and importance of programmable controllers in automated processes
- - Become familiar with the most typical applications of programmable controllers

***Unit: MEA-2001 Introduction to Precision Instruments***

Learning Objectives:

- - Explain the difference between precision and accuracy
- - Identify the resolution of a precision instrument
- - Determine the discrimination of a precision instrument
- - Identify the basic components of a measurement

***Unit: CMP-1001 Background and History of Composites***

Learning Objectives:

- - Define a composite material
- - List the two constituents of composite materials
- - List types of composite materials
- - List the major purpose of a binder
- - List the major purpose of a reinforcement

***Unit: CNC-1003 CNC Controllers***

Learning Objectives:

- - Understand the history of CNC machine tools
- - Identify the major areas of a CNC controller
- - Identify common features on a CNC controller

***Unit: AER-1003 Principles of Flight***

Learning Objectives:

- - Identify the four forces that act upon an aircraft
- - Explain the impact of atmospheric pressure on an airplane
- - Explain the function of an airfoil
- - Explain the principles of lift

***Unit: WEL-2004 Welding Basics***

Learning Objectives:

- - Describe the fillet welds and butt welds
- - Define welding
- - Describe three AWS-recognized welding processes
- - Explain the basic joint types
- - List the different welding positions
- - Explain how welding affects metallurgy

## Marketing

### GoSkills

#### Introduction to Marketing

***Unit: Articulate Your Product or Service***

Learning Objectives:

- - Create a bold promise that will grab the attention of my prospects

***Unit: Creating Marketing Content***

Learning Objectives:

- - Create marketing content with items of value
- - Understand the advertising framework for any medium

***Unit: Define Your Ideal Client***

Learning Objectives:

- - Identify my ideal client and how to connect with them

***Unit: Create a Marketing Plan***

Learning Objectives:

- - Create a simple, effective marketing plan
- - Articulate a compelling message to build rapport with your audience

***Unit: Get Online***

Learning Objectives:

- - Use social media, blogs, and websites to attract more customers to my brand.

***Unit: Promote***

Learning Objectives:

- - Promote my services through email campaigns, print/online advertising.

***Unit: Track, Measure and Adjust***

Learning Objectives:

- - Convert prospects into customers and fans.

***Unit: Intro to Marketing: Final Exam***

Learning Objectives:

- - Completion

**Open Textbooks****Global Marketing In a Digital World*****Unit: GMDW01: Introduction to Global Marketing***

Learning Objectives:

- - Define global marketing and its key concepts
- - Differentiate between domestic and global value chains, highlighting their components.
- - Analyze the motivations for firms entering or avoiding international markets.
- - Distinguish between various marketing approaches: domestic, international, export, multinational, and global marketing.

- - Summarize the advantages and drawbacks of global marketing for firms and managers.

***Unit: GMDW02: The Economic and Political Environment***

Learning Objectives:

- - Highlight the significance of the economic environment.
- - Explore the consequences of inflation, deflation, and balance of payments.
- - Emphasize the importance of the political environment and define political risk.
- - Analyze the impact of government policy changes on international marketing and define legal risk.
- - Summarize the importance of the legal environment.

***Unit: GMDW03: Social and Cultural Environment***

Learning Objectives:

- - Explore external factors shaping the global marketing environment.
- - Enumerate elements within a firm's cultural environment.
- - Emphasize the impact of culture on markets and define it.
- - Identify various types of culture.
- - Define and utilize Hofstede's and Hall's cultural categories, along with other culture determinants.

***Unit: GMDW04: Global Market Planning***

Learning Objectives:

- - Recognize factors for global market selection.
- - Detail CAGE analysis components.
- - Clarify strategies for addressing institutional voids.
- - Perform Country Attractiveness Analysis for market entry.
- - Define market segmentation and key demographic variables, explaining target market selection principles.

***Unit: GMDW05: Competing in a Global Marketplace***

Learning Objectives:

- - Explain the strategic analysis process and its significance for firms.
- - Highlight the importance of SWOT analysis in global competition assessment.
- - Outline PESTEL analysis components.
- - Identify elements of a firm's external macro environment.
- - Identify components of a firm's external micro environment, explain Porter's Five Forces, and discuss building competitive advantage strategies and determining a firm's strategic position.

**Unit: GMDW06: Global Market Entry Modes**

Learning Objectives:

- - Define and describe the five common international-expansion entry modes.
- - Discuss the advantages and disadvantages of each entry mode.
- - Explain why companies would select each mode of entry.

**Unit: GMDW07: Global Products**

Learning Objectives:

- - Define consumer product categories.
- - Explain the product life cycle.
- - Discuss marketing considerations during the product life cycle.
- - Describe the stages of new-product development.
- - Highlight the trade-offs between standardized and customized products, dimensions of value proposition adaptation, drivers behind adaptation, advantages of a global innovation strategy, steps in a firm's global innovation strategy, BOP market characteristics, and firms pursuing BOP strategies

**Unit: GMDW08: Global Pricing**

Learning Objectives:

- - Explain customer-centric pricing
- - Describe business pricing objectives.
- - Discuss discount and allowance methods.
- - Apply pricing fundamentals to the global context.
- - Explore global marketers' perspectives on pricing, approaches to global pricing determination, penetration vs. skimming strategies, and the impact of currency fluctuations on global pricing

**Unit: GMDW09: Global Distribution**

Learning Objectives:

- - List distribution channel characteristics and flows.
- - Describe channel partners' roles.
- - Explain wholesale intermediaries' functions.
- - Describe types of retailers in product distribution.
- - Differentiate supply chains from distribution channels and outline global sourcing advantages, sole-sourcing, multisourcing, and distribution management in international markets.



***Unit: GMDW10: Global Promotion***

Learning Objectives:

- - Explain integrated marketing communication (IMC).
- - Explain the promotion mix.
- - Describe common marketing communication methods, including their advantages and disadvantages.
- - Explain how organizations use IMC to support their marketing strategies.
- - List driving factors in global promotion decisions.

***Unit: GMDW11: The Global Marketing Plan***

Learning Objectives:

- - Explain how the marketing plan is used to track progress, evaluate impact, and adjust course where needed.
- - Explain why and how to update the marketing plan.
- - Outline the decision sequence in international marketing.
- - Explain how the marketing mix elements are integrated in the international marketing plan.
- - Explain how the basic principles of marketing apply to global marketing.

***Unit: GMDW12: Creating a Global Brand***

Learning Objectives:

- - Outline brand architecture elements.
- - Explain corporate brand endorsement's value.
- - Discuss global branding's pros and cons.
- - Identify centralized vs. decentralized decision-making trade-offs.
- - Describe branding challenges in emerging markets and multinational company brand structures.

***Unit: GMDW13: Introduction to E-Commerce***

Learning Objectives:

- - Define e-business and e-commerce, differentiating between them.
- - List major e-business categories.
- - Describe e-commerce pros and cons.
- - Outline the business-to-consumer e-commerce cycle.
- - Summarize major e-commerce models and discuss related technologies and emerging trends like social commerce and New Retail.

### ***Unit: GMDW14: Emerging Technology***

Learning Objectives:

- - Describe the difference between the Internet and World Wide Web.
- - Discuss the history of artificial intelligence.
- - Define artificial intelligence and distinguish between the types.
- - Explain autonomous and extended reality technologies.
- - List some of the emerging technology trends and their impact on business.

### **Intro to Social Media**

#### ***Unit: ISM01: Marketing Principles***

Learning Objectives:

- - Understand the evolving landscape of marketing in the digital age, particularly during the COVID-19 pandemic
- - Apply basic marketing principles to social media marketing strategies, recognizing the importance of the "Four P's" in a digital context.

#### ***Unit: ISM02: Crafting a Social Media Strategy for Your Business***

Learning Objectives:

- - Identify the key elements of developing a successful social media strategy, including understanding your target audience and competition
- - Utilize the "See, Think, Do, Care" framework to create a comprehensive social media strategy that integrates content, marketing, and measurement.

#### ***Unit: ISM03: Social Media 101***

Learning Objectives:

- - Explore the significance and unique characteristics of major social media platforms such as Twitter, Facebook, Instagram, YouTube, TikTok, and LinkedIn
- - Recognize the role of analytics as the foundation of an effective social media strategy and leverage third-party tools and AI for optimization and time management

### **Pointful Education**

#### **Meta Social Media**

##### ***Unit: Meta Social Media 01: The Value of Meta***

Learning Objectives:

- - Understand Meta technologies and their practical applications.
- - Explore the utilization of Meta technologies for establishing a robust online presence.

- - Explain effective strategies for engaging with an audience and fostering business growth.
- - Assess and set an ad campaign budget, utilizing Meta Ads Manager to establish spending limits.
- - Determine how to implement a structured schedule for marketing campaigns and understand its purpose in achieving marketing objectives.

#### ***Unit: Meta Social Media 02: Establishing a Platform Presence Part I***

##### Learning Objectives:

- - Acquire the skills to proficiently create and modify a Facebook page.
- - Recognize the suite of Facebook tools tailored for business applications.
- - Articulate the process of building a Facebook page following and posting content on a business page.
- - Understand techniques for establishing an online presence for a business using the complimentary tools and features within an Instagram business account.
- - Explore the creative functionalities and communication tools available on Instagram to effectively engage and connect with customers.

#### ***Unit: Meta Social Media 03: Establishing a Platform Presence Part II***

##### Learning Objectives:

- - Gain insights into the significance of a WhatsApp Business account, its setup process, and strategies for effective customer engagement.
- - Comprehend the functionalities and utilities embedded within Meta Business Suite.
- - Employ Meta Business Suite tools to efficiently oversee your online presence across both Facebook and Instagram. This includes customer interaction, Messenger utilization, ad creation, and business expansion, all centralized for streamlined management.
- - Acquire the skills to engage with customers through Messenger, utilizing its tools for more efficient and effective communication.

#### ***Unit: Meta Social Media 04: Advertising Fundamentals***

##### Learning Objectives:

- - Gain proficiency in generating ads through Facebook Ads Manager from a Facebook account.
- - Develop proficiency in crafting ads using Instagram Ads Manager from an Instagram account.
- - Assess the advantages of integrating business goals into advertising strategies.
- - Align specific business objectives with corresponding ad objectives for strategic coherence.

- - Understand the methodologies for measuring the effectiveness and success of advertisements.

#### ***Unit: Meta Social Media 05: Creating and Managing Ads Part I***

##### Learning Objectives:

- - Articulate the concept of defining target audiences when constructing ad campaigns.
- - Analyze and differentiate between new audiences, Custom Audiences, and lookalike audiences.
- - Employ Meta Ads Manager proficiently to generate new audiences, Custom Audiences, and lookalike audiences.
- - Master the application of audience segmentation while strategically mapping ideal audiences into ad sets.
- - Recognize the utilization of sources for Custom Audiences and ensure the quality of generated lookalike audiences.

#### ***Unit: Meta Social Media 06: Creating and Managing Ads Part II***

##### Learning Objectives:

- - Comprehend the significance of establishing a campaign budget within Meta Ads Manager.
- - Choose the optimal ad placement and format tailored to a specific business goal.
- - Apply delivery tips to effectively connect with an estimated customer base.
- - Understand the strategic deployment of creative elements and action buttons to enhance the impact of an advertisement.

#### ***Unit: Meta Social Media 07: Creating and Managing Ads Part III***

##### Learning Objectives:

- - Develop compelling ad text (copy) and select suitable images and videos for effective ad creation
- - Evaluate and differentiate the capabilities and advantages of both the Meta Pixel and the Conversions API.
- - Apply the Meta Pixel and Conversions API proficiently to analyze data stemming from both standard and custom customer events.

#### ***Unit: Meta Social Media 08: Reporting***

##### Learning Objectives:

- - Understand how to navigate and adjust privacy settings across Facebook, Instagram, WhatsApp, and Messenger.

- - Articulate the methods through which individuals can manage and control their shared content, emphasizing data aggregation through data hashing.
- - Recognize prevalent reasons for the rejection of ad copy, creative elements, and landing pages to enhance advertising compliance.

## Social Media Business Marketing

### *Unit: SMBM 12: Final Exam*

Learning Objectives:

- - Completion

### *Unit: SMBM 00: Introduction to Social Media*

Learning Objectives:

- - Completion

### *Unit: SMBM 04: Social Media Campaigns*

Learning Objectives:

- - Explain a typical social media campaign and provide examples from current business on the Web
- - Describe project management essentials in relation to a social media campaign, including creating a social media editorial calendar
- - Assemble a project team of writers, editors, graphic designers, and subject-matter experts (SMEs) to satisfy the technical and marketing needs of a social media strategy
- - Gather appropriate data for a successful social media campaign and identify the appropriate metrics for determining or declaring success in social media
- - Given a scenario, explain the tactics and strategies for a social media campaign, including content, timing, communication, influencers, keywords, and gamification
- - Describe how to support the message of a social media campaign
- - Given a scenario, create a call to action for a social media campaign
- - Explain the types of content that can be used in a social media campaign. Given a scenario, create or select the appropriate content for a social media campaign
- - Explain how to find, organize, and share curated content for use in social media campaigns and identify challenges of using curated content

### *Unit: SMBM 01: Social Media in Business Part I*

Learning Objectives:

- - explain what engagement is in social media and how it is measured, including conversation volume, applause, sentiment, and amplification.

- - Identify common types of tools used with social media and explain what kind of information they provide.
- - explain factors that influence the facilitation of social media throughout a business, including executive buy-in, company culture, organizational structure, and organizational arrangement.
- - plan social media for a fictitious business, including the business mission and its SMART core business and organizational goals.
- - explain how using crowdsourcing and crowd-shaping in social media have affected business innovation.
- - Identify social media positions and the tasks and responsibilities of each role.

#### ***Unit: SMBM 02: Social Media in Business Part II***

##### Learning Objectives:

- - Given a scenario, determine the impact on a business of implementing social media, including budgets, staffing, training, and policies.
- - Explain the types of communication links that can exist with businesses using social media.
- - Describe organizational assets to leverage in a social media campaign, such as content, social media accounts, employees, influencers, and company-specific resources.
- - Explain elements that can help boost brand recognition on social media, such as consistency, social profiles, social voice and tone, and social characters
- - Create a personal online social media profile.
- - List advantages and disadvantages of using social media in business.

#### ***Unit: SMBM 03: Social Media Strategy***

##### Learning Objectives:

- - Describe the cycle of a social media strategy plan
- - Conduct social media audits to assess the social media landscape, including brand presence, sentiment, positioning and competition
- - Explain the importance of market segments that impact a social media strategy, such as geographic, demographic, psychographic and behavioral segments
- - Develop social media personas for a business
- - Identify the primary and secondary target social media audiences for a company, brand or product
- - Perform a strengths, weaknesses, opportunities, and threats (SWOT) analysis based on a social media audit
- - Explain the importance of making data-driven decisions in a business

**Unit: SMBM 07: Social Media Risk, Reputation, and Crisis Management**

## Learning Objectives:

- - Explain the types of risks related to social media that a business might encounter.
- - Explain how organizational weaknesses can put a business at risk on social media.
- - Identify the steps to performing a social media risk assessment.
- - Describe components of an effective social media risk management strategy, including governance, processes and systems.
- - Explain the purpose and importance of social media policies.
- - Describe social media data and how it might be accidentally or maliciously misused by employees or non-employees.
- - Given a scenario, describe legal, regulatory and compliance issues that a business might encounter because of social media.
- - Identify reputation risk factors for a business that are related to social media.
- - Describe the components that make up a social media crisis plan, including roles, messages and action plan.
- - Explain the stages of a social media crisis, including detection, identification, response and recovery.

**Unit: SMBM 05: Social Media Platforms**

## Learning Objectives:

- - Choose the appropriate social media platform and find social networks for a specific industry or niche. Given a scenario, justify a social media platform choice, including business objectives for your social media campaign
- - Assess the environment and audience of a social media site. Determine audience composition for a social media site, including the number of followers and various demographics
- - Identify the metrics available on social media platforms
- - Determine platform-specific strategies and tactics you can employ on various social media platforms
- - Identify the dynamics of a social media community. Describe how to build a social media community
- - Describe the primary responsibilities of a social media community manager, including being the “face” of the brand
- - Identify communication strategies that allow community members to have a voice in your community
- - Given a scenario, determine how to identify and work successfully with social media contributors and influencers
- - Identify social media trends and ways to use them to your advantage

***Unit: SMBM 09: Social Media Advertising Part II***

## Learning Objectives:

- - Describe how to advertise on Instagram through a Facebook business page.
- - Create a Twitter advertisement, selecting the appropriate ad type, audience, budget, and metrics.
- - Create a LinkedIn advertisement, selecting the appropriate ad type, audience, budget, and metrics.
- - Explain how to advertise on Google platforms (Google+, YouTube).
- - Describe how to create a Promoted Pin on Pinterest.
- - Given a scenario, describe how to select the best platform for your business.
- - Describe best practices for creating social media advertising.

***Unit: SMBM 06: Social Media Presentations and Blogs***

## Learning Objectives:

- - Explain how presentations (e.g., Webinars, Webcasts, podcasts and live streaming) can be social
- - Develop objectives for a social presentation
- - Analyze gathered data on audience needs, values and constraints for a social presentation
- - Create a social presentation using a three-part structure (i.e., beginning, middle and end). Deliver a social presentation
- - Use techniques to reduce speaking anxiety before and during a social presentation
- - Prepare notes and visual aids for a social presentation
- - Describe how to lead a question-and-answer session
- - Explain how a business blog can provide multiple functions for a social media strategy

***Unit: SMBM 11: Social Media Reporting and Optimization***

## Learning Objectives:

- - Describe what a social media report is and the steps for creating one.
- - Identify types of social media reports and scenarios where they are useful.
- - Explain how the audience should be considered when creating a social media report.
- - Describe what social media optimization (SMO) is and how it fits into the social media strategy planning cycle.
- - Explain how social media can be optimized by integrating it into traditional marketing campaigns.
- - Describe methods of optimizing content for social media.
- - Describe how metadata is used for SMO and identify the types of metadata protocols (Open Graph, Twitter Cards, and schema.org) and their tag structures.



- - Explain how social media optimization (SMO) can have an impact on search engine optimization (SEO) and steps you can take to improve your SEO using SMO.

#### *Unit: SMBM 08: Social Media Advertising Part I*

##### Learning Objectives:

- - Describe the differences between paid and organic social media.
- - Given a scenario, identify the target objective and audience for an advertising campaign.
- - Explain how to set a social media budget for an advertising campaign.
- - Describe how to measure the performance of an advertising campaign.
- - Describe the type of content that makes the best ads on social media, and how to test variations of ads using A/B testing.
- - Create a Facebook advertisement, selecting the appropriate ad type, audience, budget, and metrics.

#### *Unit: SMBM 10: Social Media Metrics and Analysis*

##### Learning Objectives:

- - Describe what big data is, how it is related to social media, and the types of data that social media generates.
- - Describe strategies for analyzing big data generated from social media.
- - Identify the characteristics of big data, including volume, velocity, variety, veracity, confidence, context and choice.
- - Describe what social media mining is and its process.
- - Explain how to extract and archive data from social media
- - Explain the process of cleaning and transforming big data so it is ready for analysis.
- - Describe how visualizing big data from social media can help a company when analyzing data.
- - Describe how to calculate social media ROI.
- - Identify the types of social media metrics that can be used for different stages of the social media funnel.
- - Describe what a conversion is in social media, how to measure conversions and the various types of conversion attribution models.

## Science, Technology, Engineering & Mathematics (STEM)

### Certify ED

#### Drone (Video & VR)

##### *Unit: Drone - The Evolution and Components of Unmanned Aircraft Systems*

###### Learning Objectives:

- - Explain the history of unmanned aircraft systems (UAS).
- - Discuss the recent developments in UAS technology.
- - Explain the UAS flight as a system of people.
- - Identify Fixed wing UAS.
- - Identify Rotary wing UAS.

##### *Unit: Drone - Drone Operations: Theory and Practice*

###### Learning Objectives:

- - Explain vertical take off and landing (VTOL) UAS.
- - Perform preflight inspection procedures.
- - Discuss maintenance requirements.
- - Discuss emergency procedures in operating an unmanned aircraft.
- - Discuss crew risk management.

##### *Unit: Drone - Aerodynamics and Flight Dynamics of Drones*

###### Learning Objectives:

- - Identify the aerodynamics of flight.
- - Explain the four forces acting during flight.
- - Describe the effects of lift on flight.
- - Explain unmanned aircraft loading.

##### *Unit: Drone - The Four Forces of Flight: Weight, Thrust, Drag, and Center of Gravity*

###### Learning Objectives:

- - Describe the effects of weight on flight.
- - Describe effects of thrust on flight.
- - Describe the effects of drag on flight.
- - Explain the center of gravity and its effects on flight.

##### *Unit: Drone - Unit Sim*

###### Learning Objectives:

- - Learn the basics of successfully flying your drone.
- - Learn to operate your drone's onboard camera.
- - Practice control and stability as you maneuver through an obstacle course in an urban setting.
- - Control and stabilize your drone carrying added weight.
- - Search for and identify points of interest (POIs)
- - Control and stabilize your drone through varying degrees of extreme atmospheric conditions and ground obstructions that cause wind gusts in varying speed and direction.
- - Navigate through hard-to-reach places using your drone's agility.

#### ***Unit: Drone - Visual Line of Sight (VLOS) Operations and Radio Communication Procedures***

##### Learning Objectives:

- - Explain Visual Line of Sight (VLOS) operations.
- - Discuss radio and communication procedures for operating a unmanned aircraft.

#### ***Unit: Drone - Navigating the Skies: Understanding and Avoiding Airspace Restrictions***

##### Learning Objectives:

- - Explain how to request a Temporary Flight Restriction(TFR).
- - Demonstrate how to use a sectional chart for awareness of controlled airspace.
- - Demonstrate how to use a sectional chart for awareness of uncontrolled airspace.
- - Demonstrate how to use a sectional chart for awareness of other airspace.

#### ***Unit: Drone - Weight and Balance and Physiological Factors***

##### Learning Objectives:

- - Explain how weight and balance are critical for flight safety.
- - Explain the physiological factors affecting pilot performance.

#### ***Unit: Drone - Understanding Weather and Its Impact on Drone Flights***

##### Learning Objectives:

- - Explain how to request a weather brief when flight planning.
- - Interpret weather phenomenon affecting UAS flight.
- - Explain how pressure has effects on performance of an unmanned aircraft.
- - Explain how temperature change affects lift.
- - Explain the effects of wind on an unmanned aircraft.
- - Explain the effects of density when flying an unmanned aircraft.
- - Explain how thunderstorms work.

***Unit: Drone - Drones in Action: Applications Across Industries***

Learning Objectives:

- - Discuss how UAS is used in Aerial Photography.
- - Describe applications for UAS in bridge inspection.
- - Describe applications for UAS in search and rescue.
- - Identify UAS use in tactical applications.
- - Interpret the future of UAS Development.

***Unit: Drone - Understanding UAS Regulations and Flight Planning***

Learning Objectives:

- - Identify regulatory requirements for UAS use.
- - Explain personal license requirements.
- - Identify what constitutes a small UAS.
- - Explain Part 107 waiver.
- - Identify flight restrictions around airports.
- - Identify visual flight rules (VFR) terms and symbols.
- - Explain how to request a NOTAM when flight planning.

**Fundamentals of Robotics (Video & VR)*****Unit: Fundamentals of Robotics - A Comprehensive Overview and Essential Electrical Concepts***

Learning Objectives:

- - Explore the robotics field and the different industries in which robotics is used.
- - Explain some of the main applications for robotics.
- - Explain charge.
- - Explain voltage.
- - Explain current.

***Unit: Fundamentals of Robotics - Resistors, Capacitors, Inductors, and Circuit Diagrams***

Learning Objectives:

- - Explain electrical resistance and identify the function of resistors.
- - Explain Ohm's Law and its usefulness.
- - Explain electrical capacitance and identify the function of capacitors.
- - Explain electrical inductance and identify the function of inductors.
- - Explain the basic schematic drawings of electronic circuitry.

***Unit: Fundamentals of Robotics - Fundamentals of Electrical Circuits and Motors for Robotics***

Learning Objectives:

- - Describe how speed, position, and torque are controlled in servo motors.
- - Explain series circuits and their uses.
- - Explain parallel circuits and their uses.
- - Describe the difference between alternating and direct current.
- - Describe how a DC motor works and is used.
- - Describe how speed, torque, and power are controlled in DC motors.
- - Describe how servos are used in robotics to create movement, such as robot arms, legs, steering, et al.

#### ***Unit: Fundamentals of Robotics - Breadboarding Fundamentals and Circuit Testing***

Learning Objectives:

- - Demonstrate how a breadboard works and why it is used.
- - Demonstrate basic breadboard construction techniques.
- - Explain DC power source and describe its operation.
- - Describe a digital multimeter (DMM) and its operation.

#### ***Unit: Fundamentals of Robotics - Unit Sim***

Learning Objectives:

- - Understand how to create a rule, wildcard and anchor

#### ***Unit: Fundamentals of Robotics - Robotics Hardware: Components, Design, and Sensors***

Learning Objectives:

- - Explain the use of printed circuit boards and demonstrate how to design their schematics.
- - Demonstrate basic soldering techniques.
- - Describe magnetics and its use and implications in robotics.
- - Explain the basic operation of robot sensors.
- - Differentiate between active and passive sensors relative to their use.
- - Describe different types of sensors used in robotics and how they work.
- - Describe the engineering design process and the activities performed in each step.

#### ***Unit: Fundamentals of Robotics - Programming Fundamentals for Robotics***

Learning Objectives:

- - Describe fundamental elements of a computer program.
- - Explain the importance of a planning a program and programming design review.
- - Explain the writing of code, compiling, levels of programming languages, and types of error.

***Unit: Fundamentals of Robotics - Boolean Logic, Digital Circuits, and Introduction to Programming***

Learning Objectives:

- - Describe Boolean logic.
- - Explain important Boolean laws and logic operators.
- - Describe digital logic.
- - Define the term algorithm and explain how it relates to problem-solving, design, and data flow.
- - Identify programming language design approaches and paradigms.
- - Explain different data types and their uses as variables in programming, including naming conventions.

***Unit: Fundamentals of Robotics - Programming Fundamentals for Robotics: Sequencing, Selection, and Iteration***

Learning Objectives:

- - Describe the structure of a simple program, and explain why sequencing is important.
- - Describe selection programming structures and explain the logic used for IF statements.
- - Describe iterative programming structures and how they are used in programming.

***Unit: Fundamentals of Robotics - Debugging and Database Management in Robotics***

Learning Objectives:

- - Troubleshoot and debug errors in code.
- - Describe the role of diagnostics and troubleshooting to the engineering design process.
- - Define a database, and identify basic components of databases.
- - Describe how fields and records in different tables are related.
- - Describe database rules and their importance.
- - Analyze the use of flowcharts and pseudocode in designing a computer program.
- - Describe the software development cycle.

***Unit: Fundamentals of Robotics - Software Foundations of Robotics: AI, ML, and Programming Environments***

Learning Objectives:

- - Explain and explore the types of robotic software.
- - Describe how artificial intelligence (AI) and machine learning (ML) can be used in robotics.
- - Explain coding environments for robots.
- - Create a behavior case for a robot.

- - Create keyword phrase for a robot.
- - Create a question and answer sequence for a robot.

## Gittel Grant

### Environmental Engineering

#### *Unit: Lesson 01: Air Pollution*

Learning Objectives:

- - Define Respiration
- - Distinguish between inhaling and exhaling
- - Understand how pollutants affect respiration

#### *Unit: Lesson 02: Plant Needs*

Learning Objectives:

- - Define an organism
- - Identify what an organism needs to survive
- - Differentiate between plants and animals

#### *Unit: Lesson 03: Hydroponics*

Learning Objectives:

- - Identify causes of land pollution
- - Define Hydroponics

#### *Unit: Lesson 04: Plant Structure*

Learning Objectives:

- - Identify parts of a plant
- - Identify the function of each plant part
- - Identify which life functions each plant part performs.

#### *Unit: Lesson 05: Bubbly Science*

Learning Objectives:

- - Understand the particle state of a gas
- - Understand the particle state of a liquid
- - Define condensation

#### *Unit: Lesson 06: Floods*

Learning Objectives:

- - Define Weather
- - Identify the importance of weather alert systems
- - Understand how levees limit flooding

#### ***Unit: Lesson 07: Oil Spills***

Learning Objectives:

- - Identify the three spheres of the earth
- - Identify the human impact of pollution on the biosphere
- - Understand the damage caused by oil spills

#### ***Unit: Lesson 08: Microbes 1***

Learning Objectives:

- - Define Microorganism
- - Differentiate between bacteria, viruses, and fungi
- - Understand that some microorganisms are helpful

#### ***Unit: Lesson 09: Microbes 2***

Learning Objectives:

- - Classify bacteria based on their shape
- - Understand the naming system used for bacteria

#### ***Unit: Lesson 10: Microbial Fuel Cell***

Learning Objectives:

- - Define microbial fuel cell
- - Identify different species of electrogenic bacteria

#### ***Unit: Lesson 11: Circuits***

Learning Objectives:

- - Identify parts of a circuit
- - Understand why metals conduct electricity

#### ***Unit: Lesson 12: Minerals***

Learning Objectives:

- - Relate elements, minerals, and rocks
- - Identify properties of minerals

#### ***Unit: Lesson 13: Forces and Energy***

Learning Objectives:



- - Define a force
- - Understand how forces act on earth
- - Differentiate between potential and kinetic energy

***Unit: Lesson 14: Hurricanes***

Learning Objectives:

- - Define precipitation
- - Understand how hurricanes form

***Unit: Lesson 15: Earthquakes***

Learning Objectives:

- - Understand why humans monitor weather
- - Define an earthquake
- - Differentiate between different seismic waves

***Unit: Lesson 16: Bacterial Growth***

Learning Objectives:

- - Identify the conditions necessary for bacterial growth
- - Define binary fission

***Unit: Lesson 17: Antibiotics***

Learning Objectives:

- - Understand how antibiotics were discovered
- - Understand when antibiotics are used

***Unit: Lesson 18: Disinfectants***

Learning Objectives:

- - Understand how antibiotics were discovered
- - Understand when antibiotics are used

***Unit: Lesson 19: Heart Rate***

Learning Objectives:

- - Define heart rate
- - Identify how different factors affect heart rate

***Unit: Lesson 20: Sugar***

Learning Objectives:

- - Understand how antibiotics were discovered
- - Understand when antibiotics are used

### **Unit 1: Introduction to STEM**

#### ***Unit: Unit 1: Introduction to STEM: Lesson 01-02***

Learning Objectives:

- - Identify the four main kinds of engineering
- - Identify which branch of engineering a specific application belongs to
- - Define the job of a systems engineer
- - Predict which jobs belong to a designer and which to an engineer

#### ***Unit: Unit 1: Introduction to STEM: Lesson 03-04***

Learning Objectives:

- - Understand and apply all stages of the engineering design process.
- - Plan a project using the engineering design process.

#### ***Unit: Unit 1: Introduction to STEM: Lesson 05-06***

Learning Objectives:

- - Learn How To SCAMPER
- - Evaluate The Usefulness of The Design Process When It Comes To Developing Solutions

#### ***Unit: Unit 1: Introduction to STEM: Lesson 07-08***

Learning Objectives:

- - Understand how to use Tinkercad

#### ***Unit: Unit 1: Introduction to STEM: Lesson 09-10***

Learning Objectives:

- - Identify different forces as a push or a pull.
- - Differentiate between tension and compression forces.
- - Analyze materials to determine their relative strength in compression and tension.
- - Identify how the spring scale is used to measure force
- - Understand what the unit “Newton” implies.

#### ***Unit: Unit 1: Introduction to STEM: Lesson 11-12***

Learning Objectives:

- - Understand 4 main categories of materials and identify how each reacts with different forces applied.
- - Understand intrinsic and extrinsic properties and develop an understanding of identifying properties.

***Unit: Unit 1: Introduction to STEM: Lesson 13-14***

Learning Objectives:

- - Understand that the internal structure determines the properties of materials
- - Define thermal and electrical conductivity, hardness, ductility, malleability, luster, and the ability to reflect, refract, and absorb.

***Unit: Unit 1: Introduction to STEM: Lesson 15-16***

Learning Objectives:

- - Understand What is a textile?
- - Understand History of Textiles
- - Understand Careers in Textile Engineering

***Unit: Unit 1: Introduction to STEM: Lesson 17-18***

Learning Objectives:

- - Understand the 17 global goals and a commitment to solving real-world issues
- - Identify real-world goals that they connect with

***Unit: Unit 1: Introduction to STEM: Lesson 19-20***

Learning Objectives:

- - Understand Project Management

***Unit: Unit 1: Introduction to STEM: Lesson 21-25***

Learning Objectives:

- - Completion

**Unit 2: Electrical Engineering I**

***Unit: Unit 2: Electrical Engineering I: Lesson 01-02***

Learning Objectives:

- - Define the word "force"
- - Understand Effect of Distance on Magnitude of Force
- - Understand Energy Transfers

***Unit: Unit 2: Electrical Engineering I: Lesson 03-04***

Learning Objectives:

- - Differentiate between the seven kinds of energy
- - Define the seven types of energy
- - Identify energy transfers
- - Understand the law of conservation of energy

***Unit: Unit 2: Electrical Engineering I: Lesson 05-06***

Learning Objectives:

- - Understand how to charge a neutral object
- - Differentiate between friction, conduction, and induction

***Unit: Unit 2: Electrical Engineering I: Lesson 07-08***

Learning Objectives:

- - Differentiate between static and kinetic friction.

***Unit: Unit 2: Electrical Engineering I: Lesson 09-10***

Learning Objectives:

- - Understand how an electrochemical cell works
- - Develop an understanding of electrolyte effectiveness and potential differences.

***Unit: Unit 2: Electrical Engineering I: Lesson 11-12***

Learning Objectives:

- - Use digital circuit builders to develop an understanding of circuit basics
- - Differentiate between conductors and insulators.
- - Differentiate between open and closed circuits.

***Unit: Unit 2: Electrical Engineering I: Lesson 13-14***

Learning Objectives:

- - Define and measure voltage using voltmeters
- - Identify careers and STEM fields where electrical engineering is key.

***Unit: Unit 2: Electrical Engineering I: Lesson 15-16***

Learning Objectives:

- - Understand Increasing or Decreasing Voltage

***Unit: Unit 2: Electrical Engineering I: Lesson 17-18***

Learning Objectives:

- - Learn about current, and how to use an ammeter.
- - Identify what effect adding different components to a circuit will have on the voltage.

***Unit: Unit 2: Electrical Engineering I: Lesson 19-20***

Learning Objectives:

- - Understand how to Make a paper circuit

***Unit: Unit 2: Electrical Engineering I: Lesson 21-25***

Learning Objectives:

- - Completion

**Unit 3: Electrical Engineering II*****Unit: Unit 3: Electrical Engineering II: Lesson 01-02***

Learning Objectives:

- - Study diagrams and build the corresponding circuits, and vice versa.
- - Learn about circuit safety and identify components built to conquer problems

***Unit: Unit 3: Electrical Engineering II: Lesson 03-04***

Learning Objectives:

- - Build a series of circuits and determine how the electricity travels
- - Differentiate between dependent and independent circuit components in a series circuit

***Unit: Unit 3: Electrical Engineering II: Lesson 05-06***

Learning Objectives:

- - Build a parallel circuit and determine how the electricity travels
- - Differentiate between dependent and independent circuit components in a parallel circuit

***Unit: Unit 3: Electrical Engineering II: Lesson 07-08***

Learning Objectives:

- - Learn about push-button, knife, and double-knife switches.
- - Identify careers and STEM fields where circuit design is an applied skill.

***Unit: Unit 3: Electrical Engineering II: Lesson 09-10***

Learning Objectives:

- - Understand how to construct a pressure plate switch
- - Identify industry uses for the pressure plate switch
- - Use CAD software to model a pressure plate switch

***Unit: Unit 3: Electrical Engineering II: Lesson 11-12***

Learning Objectives:

- - Identify how a resistor functions in a circuit
- - Study appliances and identify electrical components in them

***Unit: Unit 3: Electrical Engineering II: Lesson 13-14***

Learning Objectives:

- - Identify how resistor color bands function in a circuit
- - Study appliances and identify electrical components in them

***Unit: Unit 3: Electrical Engineering II: Lesson 15-16***

Learning Objectives:

- - Relate voltage, current, and resistance mathematically.

***Unit: Unit 3: Electrical Engineering II: Lesson 17-18***

Learning Objectives:

- - Learn how diodes behave in forward bias
- - Learn how diodes behave in reverse bias
- - Learn to diagram diodes in forward and reverse bias.

***Unit: Unit 3: Electrical Engineering II: Lesson 19-20***

Learning Objectives:

- - Design and execute a carnival arcade game with a user-activated buzzer or light

***Unit: Unit 3: Electrical Engineering II: Lesson 21-25***

Learning Objectives:

- - Completion

**Unit 4: Robotics and Automation*****Unit: Unit 4: Robotics and Automation: Lesson 01-02***

No Learning Objectives available.

***Unit: Unit 4: Robotics and Automation: Lesson 03-04***

No Learning Objectives available.

***Unit: Unit 4: Robotics and Automation: Lesson 05-06***

No Learning Objectives available.

***Unit: Unit 4: Robotics and Automation: Lesson 07-08***

No Learning Objectives available.

***Unit: Unit 4: Robotics and Automation: Lesson 09-10***

No Learning Objectives available.

***Unit: Unit 4: Robotics and Automation: Lesson 11-12***

No Learning Objectives available.

***Unit: Unit 4: Robotics and Automation: Lesson 13-14***

No Learning Objectives available.

***Unit: Unit 4: Robotics and Automation: Lesson 15-16***

No Learning Objectives available.

***Unit: Unit 4: Robotics and Automation: Lesson 17-18***

No Learning Objectives available.

***Unit: Unit 4: Robotics and Automation: Lesson 19-20***

No Learning Objectives available.

***Unit: Unit 4: Robotics and Automation: Lesson 21-25***

No Learning Objectives available.

**Unit 5: Mechanical Engineering I*****Unit: Unit 5: Mechanical Engineering I: Lesson 01-02***

No Learning Objectives available.

***Unit: Unit 5: Mechanical Engineering I: Lesson 03-04***

No Learning Objectives available.

***Unit: Unit 5: Mechanical Engineering I: Lesson 05-06***

No Learning Objectives available.

***Unit: Unit 5: Mechanical Engineering I: Lesson 07-08***

No Learning Objectives available.

***Unit: Unit 5: Mechanical Engineering I: Lesson 09-10***

No Learning Objectives available.

***Unit: Unit 5: Mechanical Engineering I: Lesson 11-12***

No Learning Objectives available.

***Unit: Unit 5: Mechanical Engineering I: Lesson 13-14***

No Learning Objectives available.

***Unit: Unit 5: Mechanical Engineering I: Lesson 15-16***

No Learning Objectives available.

***Unit: Unit 5: Mechanical Engineering I: Lesson 17-18***

No Learning Objectives available.

***Unit: Unit 5: Mechanical Engineering I: Lesson 19-20***

No Learning Objectives available.

***Unit: Unit 5: Mechanical Engineering I: Lesson 21-25***

No Learning Objectives available.

**Unit 6: Mechanical Engineering II*****Unit: Unit 6: Mechanical Engineering II: Lesson 01-02***

No Learning Objectives available.

***Unit: Unit 6: Mechanical Engineering II: Lesson 03-04***

No Learning Objectives available.

***Unit: Unit 6: Mechanical Engineering II: Lesson 05-06***

No Learning Objectives available.

***Unit: Unit 6: Mechanical Engineering II: Lesson 07-08***

No Learning Objectives available.

***Unit: Unit 6: Mechanical Engineering II: Lesson 09-10***

No Learning Objectives available.

***Unit: Unit 6: Mechanical Engineering II: Lesson 11-12***

No Learning Objectives available.

***Unit: Unit 6: Mechanical Engineering II: Lesson 13-14***

No Learning Objectives available.



***Unit: Unit 6: Mechanical Engineering II: Lesson 15-16***

No Learning Objectives available.

***Unit: Unit 6: Mechanical Engineering II: Lesson 17-18***

No Learning Objectives available.

***Unit: Unit 6: Mechanical Engineering II: Lesson 19-20***

No Learning Objectives available.

***Unit: Unit 6: Mechanical Engineering II: Lesson 21-25***

No Learning Objectives available.

**Unit 7: STEM Career Exploration*****Unit: Unit 7: STEM Career Exploration: Lesson 01-02***

No Learning Objectives available.

***Unit: Unit 7: STEM Career Exploration: Lesson 03-04***

No Learning Objectives available.

***Unit: Unit 7: STEM Career Exploration: Lesson 05-06***

No Learning Objectives available.

***Unit: Unit 7: STEM Career Exploration: Lesson 07-08***

No Learning Objectives available.

***Unit: Unit 7: STEM Career Exploration: Lesson 09-10***

No Learning Objectives available.

***Unit: Unit 7: STEM Career Exploration: Lesson 11-12***

No Learning Objectives available.

***Unit: Unit 7: STEM Career Exploration: Lesson 13-14***

No Learning Objectives available.

***Unit: Unit 7: STEM Career Exploration: Lesson 15-16***

No Learning Objectives available.

***Unit: Unit 7: STEM Career Exploration: Lesson 17-18***

No Learning Objectives available.

***Unit: Unit 7: STEM Career Exploration: Lesson 19-20***

No Learning Objectives available.

**Unit: Unit 7: STEM Career Exploration: Lesson 21-25**

No Learning Objectives available.

**Pointful Education****Drones: Remote Pilot Certification****Unit: DRONES 00: Module 0 - Start Here**

Learning Objectives:

- - Completion

**Unit: DRONES 01: Introduction to the Drone Remote Pilot Exam**

Learning Objectives:

- - Describe personal and commercial uses of drones as well as potential careers in the drone industry
- - Define key terms related to drones
- - Outline the structure and topics covered in the remote pilot exam
- - Identify where to take a remote pilot exam and locate their nearest testing center
- - List the eligibility requirements to take the knowledge test
- - Discuss the importance of flying legally, following rules, and safety
- - Describe the steps to register a drone as well as the penalties for failing to register
- - Evaluate whether drone insurance is necessary and describe the cost and coverage of drone insurance

**Unit: DRONES 02: Regulations Part 1**

Learning Objectives:

- - Evaluate the necessity of regulations for the FAA and their benefits.
- - Define the eligibility requirements and pertinent terms to the Part 107 remote pilot.
- - Discuss the roles of the remote pilot and supporting crew.
- - Analyze the necessity of a penalty for falsification, reproduction, or fraudulent reproduction of certificates, reports, logbooks, or records as well as accident reporting.
- - Understand the documentation required for FAA inspections, sUAS registration, and pre-flight action and inspection.

**Unit: DRONES 03: Regulations Part 2**

Learning Objectives:

- - Analyze the importance of understanding the requirements surrounding hazardous material carriage and daylight operation.

- - Identify the rules and requirements associated with visual line of sight and right of way.
- - Discuss the rules surrounding operation over people, change of address requirements, and operation from moving vehicles or an aircraft.
- - Discuss the importance of privacy and safety operations when operating a drone.
- - Understand the laws and rules surrounding alcohol and drugs associated with operating a drone.

#### ***Unit: DRONES 04: National Airspace System***

##### Learning Objectives:

- - Identify the various airspace resources.
- - Compare and contrast the various airspace classifications, areas, and routes.
- - Use longitude and latitude to find a specific point on the globe.
- - Understand the requirements surrounding airport operations.
- - Identify airport markings and signs.

#### ***Unit: DRONES 05: Weather***

##### Learning Objectives:

- - Employ active collision avoidance procedures.
- - Understand the ramifications of wind, air masses, and fronts.
- - Analyze atmospheric stability, visibility, and clouds.
- - Evaluate the impact of thunderstorms, icing, and fog to operating a drone.
- - Use weather briefings, reports, forecasts, and charts to plan drone piloting.

#### ***Unit: DRONES 06: Loading & Performance***

##### Learning Objectives:

- - Determine speed and altitude and follow regulations surrounding them.
- - Understand the loading requirements for drones.
- - Identify the load factor requirements for an unmanned aircraft.
- - Discuss stalls in an unmanned aircraft.
- - Argue the importance of understanding the performance or operational information provided by the manufacturer of a specific drone.

#### ***Unit: DRONES 07: Operations***

##### Learning Objectives:

- - Understand the requirements for a pre-flight inspection.
- - Use appropriate pre-flight and in-flight communication procedures.
- - Identify appropriate in-flight emergency procedures.

- - Use aeronautical decision-making strategies.
- - Analyze maintenance and inspection procedures.

#### ***Unit: DRONES 08: Drone Careers***

Learning Objectives:

- - Understand the requirements and responsibilities associated with becoming a drone instructor.
- - Understand the requirements and responsibilities associated with becoming a drone pilot.
- - Discuss the requirements and responsibilities associated with becoming a drone photographer.
- - Identify the requirements and responsibilities associated with drone operation in the military.
- - Evaluate the requirements and responsibilities associated with becoming a drone technician.

#### ***Unit: DRONES 09: Course Wrap-up / Final Exam***

Learning Objectives:

- - Completion

### **Robotics Applications and Careers**

#### ***Unit: ROBO 00: Robotics Applications and Careers***

Learning Objectives:

- - Completion

#### ***Unit: ROBO 01: What is a Robot?***

Learning Objectives:

- - Describe what a robot is and explain the differences between robots and other machines
- - Summarize the history of robot development
- - Define key concepts in robotics (e.g., artificial intelligence, algorithm, machine learning, deep learning, and neural networks) and explain how robots relate to artificial intelligence
- - Examine the Three Laws of Robotics and the Turning Test
- - Identify potential risks associated with the rise of robots and AI
- - Identify career opportunities in robotics and educational paths to enter those careers

***Unit: ROBO 02: Robots in Factories***

Learning Objectives:

- - Describe the use and growth of robots in factories and manufacturing
- - Explain the Luddite uprising in England in 1812 and describe how it demonstrates peoples' reaction to technological change
- - Determine the impact of robots on jobs in manufacturing
- - Compare the benefits and limitations of utilizing robots and artificial intelligence in manufacturing
- - Identify potential career opportunities in manufacturing robotics

***Unit: ROBO 03: Robots in Healthcare***

Learning Objectives:

- - Evaluate various use cases of robotics in healthcare, including: diagnostics, robotic surgery, early disease/cancer detection, and DNA-specific drugs
- - Discuss how robots could be a component of caring for elderly populations
- - Compare the benefits and limitations of utilizing robots and artificial intelligence in healthcare
- - Determine the impact of robots on jobs in the medical field
- - Identify potential career opportunities in healthcare robotics

***Unit: ROBO 04: Robots on the Farm***

Learning Objectives:

- - Describe the change in agriculture employment from 1900 to today and the causes of the change
- - Evaluate various use cases of robotics and artificial intelligence in farming
- - Discuss how precision application of fertilizer and other robotic innovations allow for environmental benefits
- - Determine the impact of robots on jobs in the agriculture industry
- - Compare the benefits and limitations of utilizing robots and artificial intelligence in agriculture

***Unit: ROBO 05: Robots at Home***

Learning Objectives:

- - Evaluate various use cases of robotics and artificial intelligence used in home applications
- - Describe components and technologies that contribute to robots used in the home
- - Describe elements of robotics or artificial intelligence that are in smartphones and personal assistants

- - Compare the benefits and limitations of utilizing robots and artificial intelligence in the home
- - Examine the concept of the Uncanny Valley and how engineers and roboticists approach this issue

#### ***Unit: ROBO 06: Robots that Play Games***

##### Learning Objectives:

- - Define key terms related to game-playing robots
- - Evaluate various use cases of robotics playing board games, video games, and physical games (sports)
- - Compare the benefits and limitations of utilizing robots and artificial intelligence in games
- - Discuss the impact that the success of gaming robots has had on society
- - Examine how the success of combining human and robot teams could translate into other fields
- - Identify potential career opportunities in gaming robotics

#### ***Unit: ROBO 07: Robots that Drive***

##### Learning Objectives:

- - Identify key technologies that enable self-driving cars
- - Define algorithm and explain how algorithms allow self-driving cars to operate
- - Compare the benefits and limitations of utilizing robots and artificial intelligence in transportation
- - Evaluate changes in elevator operator jobs and describe how it demonstrates peoples' reaction to change in transportation technology and automation
- - Determine the impact of robots on jobs in transportation
- - Identify career opportunities in self-driving cars and educational paths to enter those careers

#### ***Unit: ROBO 08: Robots at School***

##### Learning Objectives:

- - Evaluate various uses of robotics used in education
- - Describe how robots are used to assist children with disabilities
- - Compare the benefits and limitations of utilizing robots and artificial intelligence in education
- - Discuss the impact that robots may have on the teaching profession
- - Identify career opportunities in educational robotics and describe how teachers and students can utilize robotics and AI to achieve positive educational outcomes

***Unit: ROBO 11: Course Wrap-up/Final Exam***

Learning Objectives:

- - Completion

***Unit: ROBO 10: Singularity***

Learning Objectives:

- - Define exponential growth and compare it to linear growth
- - Describe Moore's law and how it is used to predict singularity
- - Explain technological singularity
- - Evaluate contributions made by key scientists and writers on the subject of singularity, including: John Von Neumann, Vernor Vinge, Ray Kurzweil, and Stephen Hawking
- - Compare arguments made about singularity, including "will it happen" and "should it happen"
- - Predict when (if ever) singularity will occur and support argument
- - Hypothesize on the future progress of robotics

***Unit: ROBO 09: Robots with Global Impact***

Learning Objectives:

- - Identify the current and potential near-term uses of robots and artificial intelligence in war
- - Determine the impact of robots on jobs in the military
- - Evaluate various use cases of robotics used in outer space
- - Compare the benefits and limitations of utilizing robots and artificial intelligence in space
- - Identify key contributors to development of robotics in this the military and space
- - Discuss the ethics of using robots and artificial intelligence in war

**The History of Gaming and eSports*****Unit: HGE 00: Start Here***

Learning Objectives:

- - Completion

***Unit: HGE 01: Atari and the Introduction to Video Games***

Learning Objectives:

- - Define keywords related to the Atari
- - Describe how the level of technology available at the time impacted the development of the Atari game system

- - Examine the gameplay features of key Atari games like Pong, Space Invaders, PacMan, and E.T.
- - Discuss the cultural impact of Atari
- - Identify the arcade as a precursor to social gaming
- - Describe how the concept of a high score increased game engagement and appeal

#### *Unit: HGE 02: Nintendo and Game Boy*

##### Learning Objectives:

- - Define the key technologies that Nintendo used to create their original NES system and Game Boy
- - Describe the unique gameplay features and Genres that were pioneered by key NES games like Super Mario Brothers, Zelda, Final Fantasy, and Tecmo Super Bowl
- - Identify the impact of the Game Boy on the future of mobile gaming
- - Examine the intellectual property and copyright battles regarding the game of Tetris
- - Discuss the lasting cultural impact of Mario Brothers
- - Identify career opportunities as a video game designer and educational paths to enter those careers

#### *Unit: HGE 03: Super Nintendo, Sega, and Computer Games*

##### Learning Objectives:

- - Define the key technologies used in the Super NES and Sega systems and how the technology enabled new features in gameplay
- - Identify various game genres that were furthered in the era of Super Nintendo (racing, RPG, sports, action) and define the key characteristics of these genres
- - Discuss the rivalry between Nintendo and Sega
- - Describe early computer-based games and how these compared to console-based games
- - Identify career opportunities as video game tester and educational paths to enter those careers

#### *Unit: HGE 04: PlayStation*

##### Learning Objectives:

- - Define the key technologies used in the PlayStation and Nintendo N64 systems and how the technology enabled new features in gameplay
- - Evaluate the business decisions for Sony to enter the video game market
- - Describe the introduction and development of first-person shooter games
- - Examine the impact of ESRB ratings on the video game industry and compare the ESRB with other global rating systems



- - Identify career opportunities as a video game writer or artist and educational paths to enter those careers

#### ***Unit: HGE 05: Xbox***

##### Learning Objectives:

- - Describe the developments in technology and gameplay of successive generations of Xbox consoles
- - Discuss the importance of networked gaming and how services like Xbox Live changed the gaming experience
- - Evaluate the business model of console and cartridge (network effects, razor/razorblade, pricing, etc.)
- - Examine the rivalry between Sony and Microsoft
- - Identify career opportunities as a video game programmer and educational paths to enter those careers

#### ***Unit: HGE 06: Wii, Kinect and Active Gaming***

##### Learning Objectives:

- - Compare and contrast the Nintendo Wii to the other existing consoles and gaming platforms at the time it was released
- - Describe the Kinect and list reasons why it failed to live up to its initial expectations
- - Examine key active gaming titles such as Dance Dance Revolution, Wii Sports, and others
- - Evaluate the cultural impact of Guitar Hero
- - Discuss the importance of physical activity and the health risks of an inactive lifestyle

#### ***Unit: HGE 07: Mobile Games***

##### Learning Objectives:

- - Evaluate the gameplay and genres of the most popular mobile games
- - Describe the features and market positioning of the Nintendo Switch
- - Define the characteristics of a good mobile game (short, addicting, achievement, badges)
- - Explain the freemium business model and discuss in-game purchases
- - Describe gamification and how game principles are used outside of gaming for motivation and engagement
- - Identify potential career opportunities within game app development and educational paths to enter those careers

#### ***Unit: HGE 08: Augmented and Virtual Reality Gaming***

##### Learning Objectives:

- - Define key terms related to AR/VR in gaming
- - Describe the historical attempts at bringing virtual reality to gaming
- - Evaluate the platforms, features, and genres of AR gaming
- - Evaluate the platforms, features, and genres of VR gaming
- - Compare the pros and cons of AR/VR gaming to traditional gaming
- - Identify potential career opportunities within AR/VR game development and educational paths to enter those careers

***Unit: HGE 09: History and Current State of E-sports***

Learning Objectives:

- - Describe the origin and key historical development of e-sports
- - Evaluate the current scope and size of the e-sports industry
- - Identify potential career opportunities within E-sports and skills required to work in the E-sports industry
- - Describe participants in the E-sports ecosystem
- - Examine factors that make successful E-sport games

***Unit: HGE 10: Contemporary Issues in E-sports***

Learning Objectives:

- - Describe E-sports and compare what makes them different from typical video games
- - Describe major e-sports titles, genres and gameplay features
- - Define skills required to succeed as an E-sports athlete
- - Identify high school and college programs and scholarships available within E-sports
- - Discuss whether E-sports are “real sports” or not and if should they be recognized as Olympic games
- - Evaluate the culture and community within E-sports, including toxicity and gender balance

***Unit: HGE 11: Course Wrap-up / Final Exam***

Learning Objectives:

- - Completion

**STEM Advancement Inc.**

**Introduction to STEM**

***Unit: Introduction to STEM 1: Defining Engineering***

Learning Objectives:

- - Define Engineering as Problem Solving

- - Identify 4 Main Categories of Engineering
- - Understands STEM Majors

***Unit: Introduction to STEM 2: Engineering Design Process and Keeping a Log Book***

Learning Objectives:

- - Understanding the EDP
- - Importance of the engineering logbook

***Unit: Introduction to STEM 3: 3D Design and Design Thinking***

Learning Objectives:

- - Understanding Tinkercad
- - Understanding the use of the EDP

## **uniteSTEM Academy**

### **TSA DRONE Competition: How To Build Your Drone**

***Unit: Welcome to the TSA DRONE Challenge***

Learning Objectives:

- - Design, build, assemble, document, and test fly an open source Unmanned Aerial Vehicle (UAV) drone
- - Complete maneuvering and dropping tasks of varying difficulty in a course
- - Test the handling, maneuverability, hardware capabilities, and piloting of your drone

## **Transportation, Distribution & Logistics**

### **Open Textbooks**

#### **Global Value Chain**

***Unit: GVC01: Introduction to Global Value Chain***

Learning Objectives:

- - Define the term value chain, global value chain and outline its components
- - Highlight the importance of international trade process, stakeholders and documents in understanding the concept of global value chain
- - Examine the relationship between global value chain and global supply chain management

***Unit: GVC02: Distribution Logistics***

Learning Objectives:

- - Analyze the role of distribution logistics in value chain.
- - Explain the terms Inbound and Outbound Logistics and their components
- - Outline the steps in the logistics cycle
- - Assess the role of logistics service providers in this cycle

***Unit: GVC03: International Procurement***

Learning Objectives:

- - Explain the concept of procurement and how it adds value in the global value chain
- - Introduce the concepts of Sourcing and Outsourcing of Goods, Manufacturing and Services
- - Show how Suppliers are selected and the role of different components in supplier relationship models
- - Explain how supplier relationships adds value in global value chain

***Unit: GVC04: Transportation***

Learning Objectives:

- - Identify different modes of transportation and their characteristics
- - Assess infrastructure and equipment types used in different modes of transportation
- - Describe International Transport Network
- - Explain how transportation adds value to the global value chain

***Unit: GVC05: Inbound and Outbound Storage Facilities***

Learning Objectives:

- - Explain the importance of storage in Global Value Chain and the concept of Inbound and Outbound Storage
- - Offer Insights on how warehouses help in storage and role of technology in it
- - Discuss the importance of demand planning and Inventory Management in value chain
- - Describe inventory control systems and strategies used for ensuring optimal inventory levels

***Unit: GVC06: Facilitating International Freight Flows***

Learning Objectives:

- - Describe the International Chamber of Commerce (ICC) Incoterms.
- - Explain different ways to facilitate and promote trade
- - Introduce Harmonized commodity classification system and its use in international trade

***Unit: GVC07: Value Chain Vulnerability***

Learning Objectives:

- - explain the concept of value chain vulnerability by reviewing current challenges
- - Identify types of risks and disruptions
- - Examine risk management strategies to mitigate the supply chain vulnerability

***Unit: GVC08: Sustainable Value Chains***

Learning Objectives:

- - Define the term Sustainable Value Chain and how it adds value in the global value chain
- - Explain the concept of Circular Economy
- - Describe various initiatives taken by organizations to make their supply chains sustainable
- - Learn the main dimensions of sustainability in the global value chain
- - Identify key sustainability challenges in value chains and recommend solutions

***Unit: GVC09: Emerging Value Chain Concepts***

Learning Objectives:

- - Explain the concept of Reverse Logistics
- - Define how ICT is supporting the global value chain
- - Explain the concept of Value Stream Mapping
- - Explain humanitarian supply chain management, identify issues, and define recommendations and the practical implications

**Introduction to Logistics*****Unit: Introduction to Logistics***

Learning Objectives:

- - Explain the role of logistics in supply chains.
- - List the factors considered when designing the logistics in a supply chain.
- - Explain the elements that make up a logistics network.
- - Examine the importance of logistics to the economy.
- - Review supply chain professional organizations and associations.
- - Describe the impact of information technology on Logistics management.
- - Understand the role of technology in Logistics planning, and security
- - Recognize the changing Logistics Landscape due to the evolvement of technology applications in transportation.
- - Identify the cost for over-the-road moves

- - Understand how variable and fixed costs are applied in transportation
- - Identify the different modes of transportation.
- - Evaluate the characteristics, advantages and disadvantages of different transportation modes.
- - Assess the infrastructure and equipment types used in different modes of transportation.
- - Describe the considerations for packaging products
- - Compare the uses of different types of warehouses
- - Examine the role warehouses and distribution centers play in the supply chain
- - Describe the type of equipment used to load and unload products.
- - Understand the structure of logistics providers from 1 PL to 4 PL.
- - Identify the types of logistic providers.
- - Understand why companies outsource logistics services.
- - Explain the key transportation processes involved in the global supply chain.
- - Understand the difference between multimodal and intermodal transportation.
- - Explain Incoterms.
- - Understand who governs OTR transportation in Ontario.
- - Understand the rules surrounding the hours of service in the trucking industry.
- - Understand how to look up the rules pertaining to air cargo.
- - Identify risks and current challenges that supply chain logistics face.
- - explore potential risks and future challenges that supply chains logistics might face.
- - Develop risk management strategies to assess major risks and challenges for logistics in a supply chain.

## Procurement in the Supply Chain World

### *Unit: Procurement in the Supply Chain World*

#### Learning Objectives:

- - Define procurement and its purpose
- - Understand key procurement objectives
- - Explain procurement roles and activities.
- - Analyze the key procurement procedures and processes
- - Evaluate the key steps carried out in managing the procurement process.
- - Understand portfolio analyses and their use in developing procurement strategies.
- - Explain the commodity strategy development process and the key steps in that process.
- - Apply the procurement of goods and services based on their relative strategic importance.
- - Analyze the various procurement strategies used to achieve competitive advantage.

- - Evaluate current and evolving strategies in the procurement field
- - Discuss the various sources of market intelligence.
- - Recognize the use of market intelligence in identifying potential suppliers
- - Understand key supplier evaluation practices
- - Explain the need for identifying and evaluating global suppliers.
- - Understand the key aspects of procurement contract execution.
- - Implement the various forms of procurement enablers.
- - Analyze the key forms of documentation used in procurement.
- - Evaluate key aspects of managing the procurement process and managing the internal processes involved in procuring goods and services.
- - Explain what can be measured in terms of Supplier Performance.
- - Apply different types of supplier performance evaluation techniques.
- - Understand why and how to optimize the supply base.
- - Apply a supplier development process
- - Understand how to maintain relationships with suppliers.
- - Apply different methods of price analysis to determine if the price offered by the supplier is fair and reasonable.
- - Perform a cost analysis to determine if the price offered by the supplier is fair and reasonable
- - Calculate the Total Cost of Ownership to compare different suppliers' pricing.
- - Consider the Learning Curve when evaluating supplier pricing.
- - Understand discounts that may be applicable to supplier pricing.
- - Explain why companies outsource.
- - Describe the reasons why the use of outsourcing and offshoring has grown.
- - Explain some drawbacks companies face when they outsource their activities.
- - Understand that choosing whether to make or to buy a product or choosing to have services performed by an outside company, are outsourcing decisions.
- - Compare costs to keep the product or service in-house to the cost of buying the product or service from an outside party.
- - Explain the need for identifying and evaluating global suppliers.
- - Outline the advantages of global sourcing.
- - Know the pros and cons of sole-sourcing and multisourcing.
- - Know how to source successfully internationally.
- - Understand the impact Trade Agreements have on sourcing internationally.
- - Understand what ethics are and how they apply to procurement.
- - Compare the risks to individuals and organizations of unethical behaviour.
- - Analyze different types of unethical behaviour in purchasing.
- - Evaluate how to promote ethical behaviour in the workforce.
- - Establish corporate social responsibility and sustainable procurement practices.

- - Discuss the various sources of procurement information systems.
- - Understand the benefits of technology in procurement.
- - recognize the role of procurement in the enterprise resource planning (ERP) process.

## Pointful Education

### Drones: Remote Pilot Certification

#### *Unit: DRONES 00: Module 0 - Start Here*

Learning Objectives:

- - Completion

#### *Unit: DRONES 01: Introduction to the Drone Remote Pilot Exam*

Learning Objectives:

- - Describe personal and commercial uses of drones as well as potential careers in the drone industry
- - Define key terms related to drones
- - Outline the structure and topics covered in the remote pilot exam
- - Identify where to take a remote pilot exam and locate their nearest testing center
- - List the eligibility requirements to take the knowledge test
- - Discuss the importance of flying legally, following rules, and safety
- - Describe the steps to register a drone as well as the penalties for failing to register
- - Evaluate whether drone insurance is necessary and describe the cost and coverage of drone insurance

#### *Unit: DRONES 02: Regulations Part 1*

Learning Objectives:

- - Evaluate the necessity of regulations for the FAA and their benefits.
- - Define the eligibility requirements and pertinent terms to the Part 107 remote pilot.
- - Discuss the roles of the remote pilot and supporting crew.
- - Analyze the necessity of a penalty for falsification, reproduction, or fraudulent reproduction of certificates, reports, logbooks, or records as well as accident reporting.
- - Understand the documentation required for FAA inspections, sUAS registration , and pre-flight action and inspection.

#### *Unit: DRONES 03: Regulations Part 2*

Learning Objectives:

- - Analyze the importance of understanding the requirements surrounding hazardous material carriage and daylight operation.



- - Identify the rules and requirements associated with visual line of sight and right of way.
- - Discuss the rules surrounding operation over people, change of address requirements, and operation from moving vehicles or an aircraft.
- - Discuss the importance of privacy and safety operations when operating a drone.
- - Understand the laws and rules surrounding alcohol and drugs associated with operating a drone.

#### ***Unit: DRONES 04: National Airspace System***

##### Learning Objectives:

- - Identify the various airspace resources.
- - Compare and contrast the various airspace classifications, areas, and routes.
- - Use longitude and latitude to find a specific point on the globe.
- - Understand the requirements surrounding airport operations.
- - Identify airport markings and signs.

#### ***Unit: DRONES 05: Weather***

##### Learning Objectives:

- - Employ active collision avoidance procedures.
- - Understand the ramifications of wind, air masses, and fronts.
- - Analyze atmospheric stability, visibility, and clouds.
- - Evaluate the impact of thunderstorms, icing, and fog to operating a drone.
- - Use weather briefings, reports, forecasts, and charts to plan drone piloting.

#### ***Unit: DRONES 06: Loading & Performance***

##### Learning Objectives:

- - Determine speed and altitude and follow regulations surrounding them.
- - Understand the loading requirements for drones.
- - Identify the load factor requirements for an unmanned aircraft.
- - Discuss stalls in an unmanned aircraft.
- - Argue the importance of understanding the performance or operational information provided by the manufacturer of a specific drone.

#### ***Unit: DRONES 07: Operations***

##### Learning Objectives:

- - Understand the requirements for a pre-flight inspection.
- - Use appropriate pre-flight and in-flight communication procedures.
- - Identify appropriate in-flight emergency procedures.

- - Use aeronautical decision-making strategies.
- - Analyze maintenance and inspection procedures.

#### ***Unit: DRONES 08: Drone Careers***

Learning Objectives:

- - Understand the requirements and responsibilities associated with becoming a drone instructor.
- - Understand the requirements and responsibilities associated with becoming a drone pilot.
- - Discuss the requirements and responsibilities associated with becoming a drone photographer.
- - Identify the requirements and responsibilities associated with drone operation in the military.
- - Evaluate the requirements and responsibilities associated with becoming a drone technician.

#### ***Unit: DRONES 09: Course Wrap-up / Final Exam***

Learning Objectives:

- - Completion

#### **Smart Cities: Technology and Applications**

##### ***Unit: SCT 00: Start Here***

Learning Objectives:

- - Completion

##### ***Unit: SCT 02: Smart Energy***

Learning Objectives:

- - Understand the definition and history of smart energy
- - Evaluate the minimum requirements to classify a city as having smart energy
- - Identify the key features of smart energy in a Smart City
- - Evaluate the environmental impact of Smart Energy
- - Analyze the use of smart energy across the globe

##### ***Unit: SCT 01: Introduction to Smart Cities***

Learning Objectives:

- - Construct a timeline of the history of Smart Cities
- - Identify the primary components that make up a Smart City

- - Compare and contrast the differences between two Smart Cities
- - Evaluate the typical cost of a smart city based on population
- - Analyze the environmental impacts of a Smart City

#### ***Unit: SCT 03: Smart Transportation***

Learning Objectives:

- - Understand the definition and history of Smart Transportation
- - Evaluate the minimum requirements to classify a city as having Smart Transportation
- - Identify the various types of Smart Transportation
- - Identify the various types of Smart Transportation
- - Analyze the use of Smart Transportation across the globe

#### ***Unit: SCT 04: Smart Data***

Learning Objectives:

- - Define Smart Data
- - Evaluate the minimum requirements to classify data as Smart Data
- - Identify the various components of Smart Data
- - Investigate the ethical and moral concerns surrounding Smart Data
- - Analyze the use of Smart Data across the globe

#### ***Unit: SCT 05: Smart Infrastructure***

Learning Objectives:

- - Define ICT and smart infrastructure
- - Evaluate the minimum requirements to classify an infrastructure as a smart infrastructure
- - Identify the various components of a smart infrastructure
- - Evaluate the relationship between smart infrastructure and a culture of innovation
- - Analyze the use of Smart Infrastructure across the globe

#### ***Unit: SCT 06: Smart Mobility***

Learning Objectives:

- - Define Smart Mobility
- - Examine the various types of Smart Mobility
- - Identify the types of Smart Mobility used in various Smart Cities
- - Evaluate the environmental impact of Smart Mobility
- - Analyze the community benefits to Smart Mobility in a Smart City

***Unit: SCT 07: Smart Objects***

Learning Objectives:

- - Define key terms related to the Internet of Things (IoT)
- - Describe the hardware, sensors, actuators, and software that make up the IoT
- - Evaluate how IoT devices and applications contribute to creating smart cities
- - Identify the risks associated with ransomware attacks on the IoT
- - Identify career opportunities in the IoT and Smart Cities and educational paths to enter those careers

***Unit: SCT 08: Smart Government***

Learning Objectives:

- - Describe Smart Government and eGovernance
- - Describe how Smart Cities technology can improve government and better deliver services to citizens
- - Analyze the potential impact on government budgets as a result of implementing Smart City technology
- - Compare the enhanced security provided by Smart City technology with the decreased privacy from greater surveillance and tracking
- - Examine efforts by companies and governments to address risks and concerns of the Internet of Things and Smart Cities

***Unit: SCT 09: Course Wrap-up/Final Exam***

Learning Objectives:

- - Completion

**Transportation Technologies*****Unit: TRANSPORT 00: Module 0 - Start Here***

Learning Objectives:

- - Completion

***Unit: TRANSPORT 01: Introduction to the Future of Transportation***

Learning Objectives:

- - Outline the history of transportation and contrast past technological changes with current opportunities
- - Define ubiquity and discuss adoption of previous technologies such as the telephone
- - Analyze the technology adoption curve and relate it to the adoption of future transportation technologies

- - Describe limitations with current transportation modes and how future technologies can help solve some of these problems
- - Match future transportation modes with their definition
- - Evaluate a framework to evaluate futuristic transportation technologies

#### ***Unit: TRANSPORT 02: Flying Cars***

##### Learning Objectives:

- - Define what a Vertical Take-Off and Landing vehicle is and how it is different from existing modes of transportation
- - Identify historical attempts at building flying cars and technological advances that have contributed to the emergence of flying cars
- - Predict when they will ride in a flying car and justify their prediction
- - Examine existing companies that develop flying cars and match a project name with each company
- - Describe current prototypes and demonstrate a basic understanding of their underlying technologies
- - Compare the pros and cons of flying cars on the economy, society, the environment, and safety
- - Appraise future career opportunities and pathways in the flying car industry

#### ***Unit: TRANSPORT 03: Self-driving Car Technology***

##### Learning Objectives:

- - Describe the 6 levels of autonomous driving
- - Classify a driving feature into one of the 6 levels of autonomous driving
- - Identify key technologies that enable self-driving cars
- - Define algorithm and explain how algorithms allow self-driving cars to operate
- - Identify career opportunities in self-driving cars and educational paths to enter those careers
- - Examine technologies that enable self-driving trucks

#### ***Unit: TRANSPORT 04: Self-driving Cars in Society***

##### Learning Objectives:

- - Examine the risks and costs of human operated cars
- - Evaluate the risks and benefits of self-driving cars
- - Discuss ethical dilemmas in driverless car engineering and operation
- - Choose an aspect of society that will be impacted by self-driving cars (such as parking, traffic, accidents, jobs, mobility) and argue for or against self-driving cars
- - Interview a parent, teacher, or other adult about self-driving cars and hypothesize about the acceptance of self-driving cars in society

**Unit: TRANSPORT 05: Drones**

## Learning Objectives:

- - Define drones and distinguish drones from other types of aerial technology and transportation
- - Describe technologies that allow drones to fly, be controlled remotely, and operate autonomously
- - Determine the impact of drone delivery on jobs and the environment
- - Identify how drones are used to deliver food, healthcare supplies, and packages
- - Assess the safety of drone delivery
- - Predict when they will receive their first package delivered by drone
- - Identify career opportunities in drones and educational paths to enter those careers

**Unit: TRANSPORT 06: Hyperloop**

## Learning Objectives:

- - Define key technological and engineering aspects of a vactrain
- - Examine the historical development of the vactrain concept
- - Debate whether Hyperloop is practical given costs and current technologies
- - Discuss risks of the Hyperloop system, such as system failures or susceptibility to terrorism or natural disasters such as earthquakes
- - Predict when the Hyperloop or another vactrain will be operational and open to the public
- - Identify career opportunities in vactrain technology and educational paths to enter those careers

**Unit: TRANSPORT 07: Jetpacks**

## Learning Objectives:

- - Describe what a jetpack is and how it is different from existing modes of transportation
- - Identify technological advances that have contributed to the emergence of jetpacks
- - Describe historical and current prototypes and demonstrate an understanding of their underlying technologies
- - Discuss the risks involved in wearing and operating a jetpack
- - Predict whether jetpacks will be used as a regular means of transportation
- - Examine an existing company that develops jetpacks

**Unit: TRANSPORT 08: Supersonic Jets**

## Learning Objectives:

- - Define key technological terms related to supersonic jets and airplane flight

- - Differentiate between supersonic jets and regular jet airliners
- - Summarize the Concorde supersonic jet program, including its technology, cost, operations, and shortcomings
- - Discuss the noise problem of a sonic boom created by supersonic jets
- - Identify both pros and cons of supersonic jets, including safety considerations
- - Predict when supersonic jets will be used regularly for intercontinental flight
- - Examine an existing company that is developing supersonic jets
- - Identify career opportunities in aerospace and educational paths to enter those careers

#### ***Unit: TRANSPORT 09: Personal Rapid Transit***

##### Learning Objectives:

- - Describe Personal Rapid Transit Systems (PRTs) and various forms of Podcars or personal vehicles
- - Define key vocabulary words and concepts related to PRTs and podcars
- - Compare PRT Systems with existing transport systems and infrastructure
- - Examine an existing company that is developing PRTs
- - Discuss impediments to building PRTs and evaluate how PRTs' inability to gain mass adoption might impact other future transportation technologies
- - Differentiate between fixed-track PRT systems and personal transportation vehicles

#### ***Unit: TRANSPORT 10: Supercavitation***

##### Learning Objectives:

- - Define density, drag, cavitation and supercavitation
- - Differentiate between vaporous and artificial cavitation
- - Identify historical and future use cases for supercavitation
- - Discuss problems associated with supercavitation and potential solutions
- - Identify and describe other futuristic marine transportation such as autonomous and fuel-efficient ships
- - Create a business plan for a company that utilizes supercavitation

#### ***Unit: TRANSPORT 11: Space Travel***

##### Learning Objectives:

- - Review the history of rocket use and space exploration
- - Compare the benefits gained from space travel with the challenges and costs
- - Define key vocab words related to rockets and space travel
- - Describe the challenge of creating reusable rockets
- - Examine an existing company that is developing commercial space travel

- - Identify career opportunities in space travel and educational paths to enter those careers

***Unit: TRANSPORT 12: Interstellar Travel***

Learning Objectives:

- - Predict when, if ever, an interstellar voyage will be launched and justify the prediction
- - Identify challenges to interstellar travel based on today's technologies
- - Define astronomical units, light speed, propulsion, and gravity units (G-force)
- - Describe theories for interstellar travel possible
- - Compare pros and cons of proposed methods to achieve interstellar travel
- - Discuss feasibility of an interstellar mission given energy requirements and risks

***Unit: TRANSPORT 13: Course Wrap-up/Final Exam***

Learning Objectives:

- - Completion

## **uniteSTEM Academy**

### **TSA DRONE Competition: How To Build Your Drone**

***Unit: Welcome to the TSA DRONE Challenge***

Learning Objectives:

- - Design, build, assemble, document, and test fly an open source Unmanned Aerial Vehicle (UAV) drone
- - Complete maneuvering and dropping tasks of varying difficulty in a course
- - Test the handling, maneuverability, hardware capabilities, and piloting of your drone