Glenwood Community Schools
Career and Technical Education Curriculum
Mission Statement

Our mission is to engage all students in a challenging, sequential, and differentiated CTE curriculum that will develop critical thinkers, problem solvers, and effective communicators.

We believe that all students should have access to a high-quality CTE education that provides them with the skills and knowledge they need to be well-informed citizens, to be prepared for college and careers, and to understand and appreciate the CTE world.

A special thank you to the following individuals for their hard work and dedication who have served on the District CTE Subject Area Committee.

Jordan Bueltel	Kelly Schubauer	Jessica Miller	Paul Johnson
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Glenwood Community High School
Agricultural Sciences - Introduction to Agriculture, Food, and Natural Resources Curriculum
Approved Date - December 2018

Course Purpose: The student will compare and contrast the various parts of the agricultural system to determine an area interest or a potential career path.

Course Outcomes	Outcome Components	Description
IAFNR.1	**The student will explain interrelationships between natural resources and humans necessary to conduct management activities in natural environments.**	
	IAFNR.1.1	Interpret types of activities associated with agriculture from a case study about an agricultural entrepreneur.
	IAFNR.1.2	Research top commodities produced in the United States and determine costs of food to consumers.
	IAFNR.1.3	Investigate the effects organic matter has on soil porosity and soil air holding capacity.
	IAFNR.1.4	Explain how environmental factors impact soil quality
	IAFNR.1.5	Determine the spread of pollution from point and nonpoint sources.
	IAFNR.1.6	Compile ecology information to depict ecosystem differences and similarities. Simulate the flow of energy in an ecosystem.
IAFNR.2	**The student will examine the components, historical development, global implications, and future trends of the animal and/or plant systems industry.**	
	IAFNR.2.1	Define commodity and understand supply and demand of commodities globally.
	IAFNR.2.3	Research the path a prepared food item takes from production to processing and present findings.
IAFNR.3	**Premier Leadership and Personal Growth: The student will develop a skill set to enhance the positive evolution of the whole person. Acquire the skills necessary to positively influence others.**	
	IAFNR.3.1	Explore educational and personal growth opportunities available through FFA membership.
	IAFNR.3.2	Investigate career opportunities available in agriculture.
	IAFNR.3.3	Classify careers according to categories in agriculture
	IAFNR.3.4	Demonstrate verbal and nonverbal forms of communication effectively
	IAFNR.3.5	Work collaboratively to complete team building challenges.
	IAFNR.3.6	Use proper parliamentary procedures to voice an opinion.
	IAFNR.3.7	Demonstrate the proper procedures for making a main motion and an amendment.
IAFNR.4	**Career Success: The student will demonstrate those qualities, attributes and skills necessary to succeed in, or further prepare for, a chosen career while effectively contributing to society.**	
	IAFNR.4.1	Compare types of dress and the role professional dress plays in success.
	IAFNR.4.2	Develop a presentation about agricultural careers.
IAFNR.5	**Safety, Health, and Environmental: The student will demonstrate appropriate health and safety procedures for AFNR occupations.**	
	IAFNR.5.1	Identify and describe the uses of common laboratory equipment.
	IAFNR.5.2	Locate and determine the purpose of emergency equipment items located in classroom, laboratory, and shop facilities.
IAFNR.6	**Technical Skills: The student will use tools, equipment, machinery and technology appropriate to work within areas related to AFNR**	
	IAFNR.6.1	Complete components of ten Career Development Events.
	IAFNR.6.2	Use equipment properly to collect data for an experiment.

	IAFNR.6.3	Measure distance, volume, mass, temperature, and density using the appropriate tools and scale.
	IAFNR.6.4	Determine if a substance is an acid or base using pH sensor and LabQuest.
	IAFNR.6.5	Demonstrate the correct use of a microscope in order to prepare a microscope slide and identify the nucleus of an onion cell.
IAFNR.7	**Scientific Inquiry: The student will utilize scientific inquiry as an investigative method.**	
	IAFNR.7.1	Follow written procedures to complete a laboratory exercise.
	IAFNR.7.2	Demonstrate by testing the buffering ability of water and one additional substance how to neutralize a pH.
	IAFNR.7.3	Conduct an inquiry lab on the effect of pH on plant health. Write a lab report based on findings of the inquiry lab.
	IAFNR.7.4	Identify the differences in structural parts between an animal and plant cell.
	IAFNR.7.5	Extract the DNA bundles from a fruit tissue for observation. Construct a DNA model and demonstrate how DNA replication happens in a cell.
	IAFNR.7.6	Identify differences in physical features of people and trace their family traits (or create an example). Identify similarities in characteristics to trace family traits. Use concept mapping software to organize creation.
IAFNR.8	**The student will apply <u>scientific principles</u> to natural resource management activities.**	
	IAFNR.8.1	Develop a soil management plan to compile appropriate soil conservation techniques to reduce loss of soil.
	IAFNR.8.2	Conduct an experiment that models the flow of water over a landform.
	IAFNR.8.3 NRS 2.2	Perform tests to determine water quality using the factors of temperature, PH, dissolved oxygen, and total dissolved solids.
IAFNR.9	**The student will examine the relationships between energy sources and environmental service systems.**	
	IAFNR.9.1	Explain the importance of water quality
	IAFNR.9.2	Describe how plants and animals depend upon each other for survival.
	IAFNR.9.3	Identify alternative sources of energy.
	IAFNR.9.4	Examine alternative sources of energy to identify the impact agriculture has on the sources.
	IAFNR.9.5	Identify and compare common fuels used for energy production.
	IAFNR.96	Differentiate between renewable and nonrenewable resources
	IAFNR.9.7	Develop and construct an educational display that will describe an alternative energy source and the impact agriculture has on that source.
IAFNR.10	**The student will prepare and implement a plant management plan that addresses the influence of <u>environmental factors, nutrients and soil</u> on plant growth.**	
	IAFNR.10.1	Test soil permeability to understand the relationship between soil particle size and rate of water filtration.
	IAFNR.10.2	Determine the texture, structure, and color of each horizon within a soil profile.
	IAFNR.10.3	Determine requirements for germination
	IAFNR.10.4	Determine the relationship between water availability and turgor pressure.
	IAFNR.10.5	Identify the nutrients needed to grow various crops
AFNR.11	**The student will apply knowledge of <u>plant classification, plant anatomy and plant physiology</u> to the production and management of plants.**	
	IAFNR.11.1	Compare and contrast the similarities and differences between an animal cell and plant cell
	IAFNR.11.2	Identify the difference between a weed and a plant
	IAFNR.11.3	Explain the basic physiology of plants
	IAFNR.11.4	Construct a model of or diagram a basic plant with four main parts and describe the functions of each plant part.
	IAFNR.11.5	Conduct a germination trial to determine the germination rate of bean seeds. Identify the plant parts that develop from bean seeds.

IAFNR.12	**The student will classify, evaluate, select and manage animals based on anatomical and physiological characteristics.**	
	IAFNR.12.1	Evaluate animals based on anatomical and physiological features
	IAFNR.12.2	Distinguish difference between external and internal animal anatomy.
	IAFNR.12.3	Explain the importance of animal systems
IAFNR.13	**The student will examine components of the food industry and historical development of food products and processing.**	
	IAFNR.13.1	Explain current food trends, quality product, and consumer needs/wants
	IAFNR.13.2	Solve a problem related to foodborne illness outbreak.
	IAFNR.13.3	Conduct an experiment to determine bacterial levels of meat samples to understand the importance of food safety.
IAFNR.14	**The student will demonstrate skills necessary to provide for the proper health care of animals.**	
	IAFNR.14.1	Differentiate between what is normal and abnormal for animal function.
	IAFNR.14.2	Explain the characteristics of a good environment

Glenwood Community Middle School
Fundamentals of Agriculture Curriculum
Approved Date - May 2019

Course Purpose: The student will have the opportunity to learn about each of the Ag classes offered at the high school level. The course will be divided into basic sections focusing on animal terminology, animal genetics, environmental science, plant care, leadership development, FFA, farm simulation and record keeping.

Why Agriculture?

- Our world population keeps rising and we have a demand to feed 9 billion people by 2050. The agriculture industry needs passionate industry representatives committed to this challenge.
- Agricultureindustriesneedgeneticists, veterinarians, engineers, computer programmers, networkers, and agribusiness professionals on a daily basis to help our industry thrive and support the rest of the world.

Course Outcomes	Outcome Components	Description
FA.1	**The student will describe career opportunities and means to achieve those opportunities in each of the Agriculture, Food & Natural Resources career pathways.**	
	FA.1.1	Evaluate and implement the steps and requirements to pursue a career opportunity in each of the AFNR career pathways.
	FA.1.2	Examine and choose career opportunities that are matched to personal skills, talents, and career goals in an AFNR pathway of interest.
FA.2	**The student will work productively in teams while using cultural/global competence**	
	FA.2.1	Contribute to team-oriented projects and builds consensus to accomplish results.
	FA.2.2	Create and implement strategies to engage team members to work toward team and organizational goals.
FA.3	**The student will develop proposed solutions to environmental issues, problems and applications using scientific principles of meteorology, soil science, hydrology, microbiology, chemistry and ecology.**	
	FA.3.1	Apply soil science and hydrology principles to environmental service systems.
	FA.3.2	Examine and summarize factors that affect the earth's balance of energy.
FA.4	**The student will plan and conduct natural resource management activities that apply logical, reasoned and scientifically based solutions to natural resource issues and goals.**	
	FA.4.1	Apply methods of classification to examine natural resource availability and ecosystem function in a particular region.
	FA.4.2	Classify different types of natural resources in order to enable protection, conservation, enhancement and management in a particular geographical region.
FA.5	**The student will analyze historic and current trends impacting the animal systems industry.**	
	FA.5.1	Evaluate the development and implications of animal origin, domestication and distribution on production practices and the environment.
	FA.5.2	Assess and select animal production methods for use in animal systems based upon their effectiveness and impacts.
FA.6	**The student will apply principles of animal reproduction to achieve desired outcomes for performance, development and/or economic production.**	
	FA.6.1	Evaluate animals for breeding readiness and soundness.
	FA.6.2	Apply scientific principles to select and care for breeding animals.
FA.7	**The student will classify, evaluate and select animals based on anatomical and physiological characteristics.**	
	FA.7.1	Classify animals according to taxonomic classification systems and use.
	FA.7.2	Identify and summarize common classification terms utilized in animal systems.
FA.8	**The student will apply principles of classification, plant anatomy, and plant physiology to plant production and management.**	
	FA.8.1	Classify plants according to taxonomic systems.

	FA.8.2	Apply knowledge of plant anatomy and the functions of plant structures to activities associated with plant systems.
FA.9	**The student will propagate, culture and harvest plants and plant products based on current industry standards.**	
	FA.9.1	Identify examples of and summarize pollination, cross-pollination and self-pollination of flowering plants.
	FA.9.2	Critique sowing techniques for providing favorable conditions to meet the factors of seed germination.
FA.10	**The student will apply management planning principles in AFNR businesses.**	
	FA.10.1	Examine and provide examples of microeconomic principles and macroeconomic principles in the agricultural industry.
	FA.10.2	Apply micro- and macroeconomic principles to plan and manage inputs and outputs in an AFNR business.

Glenwood Community High School
Plant Science Curriculum

Course Purpose: The student will demonstrate competence in the application of scientific principles and techniques to the production and management of plants while monitoring environmental factors.

Course Outcomes	Outcome Components	Description
PS.01	**The student will apply knowledge of plant classification, plant anatomy and plant physiology to the production and management of plants. (Unit 1, 4, 5, 6, 7, 10)**	
	PS.01.1	Define and identify a variety of agricultural enterprises in food, fiber, and fuel, which are essential to daily life.
	PS.01.2	Analyze specialized anatomical features for roots, stems, leaves, and flowers that serve very specific functions.
	PS.01.3	Classify and name plants based upon distinguishing characteristics, such as their physical features and using a binomial system.
PS.02	**The student will prepare and implement a plant management plan that addresses the influence of environmental factors, nutrients, and soil on plant growth. (Unit 2, 3, 4, 6, 7, 9, 10)**	
	PS.02.1	Define soil quality and analyze soil types.
	PS.02.2	Compare and contrast geographical features and environmental factors that influence the formation of soils and impacts soil quality.
	PS.02.3	Analyzing different types of ingredients used in potting soil that provide permeability and porosity needed for container crops.
	PS.02.4	Explain factors affecting plant growth: light, water, temperature, humidity, nutrients, soil, atmosphere, and pollutants.
	PS.02.5	Identify optimal growth and development factors.
	PS.02.6	Determine nutrient deficiencies by examination of anatomical features and use of testing analysis.
PS.03	**The student will propagate, culture, and harvest plants. (Unit 3, 6, 7, 8, 10)**	
	PS.03.1	Construct a hydroponics system and manage water quality and plant needs.
	PS.03.2	Analyze the growing environment for different types of plants.
	PS.03.3	Compare and contrast between plant sexual reproduction and plant asexual reproduction.
PS.04	**The student will employ elements of design to enhance an environment. (Unit 10)**	
	PS.04.1	Formulate needs for methods of plant production.
	PS.04.2	Propose basic overall components necessary to produce and market a plant.
	PS.04.3	Measure the results of a business plan and modify steps required to produce a plant.

Glenwood Community High School
Animal Science Curriculum
Approved Date - December 2018

Course Purpose: The student will demonstrate competence in the application of scientific principles and practices to the production and management of animals.

Course Outcomes	Outcome Components	Description
ASA.1	**The student will examine the components, historical development, global implications, and future trends of the animal systems industry.**	
	ASA.1.1	Determine and analyze their usage of various animal products used from different animal species for different purposes in the agricultural industry.
	ASA.1.2	Compare domestic and wild animals using the characteristics of domestication. (Examine the development and domestication of a common of a common animal over time)
	ASA.1.3	Critique issues in animal agriculture and debate the positive and negative impacts of each issue.
	ASA.1.4	Develop a Producer's Code of Care document for the humane use of a species of animal under their care.
ASA.2	**The student will classify, evaluate, select, and manage animals based on anatomical and physiological characteristics.**	
	ASA.2.1	Classify objects based on their physical characteristics.
	ASA.2.2	Categorize animals by gender and species.
	ASA.2.3	Identify common internal and external animal parts and explain the purpose.
	ASA.2.4	Identify unique external parts specific for livestock and poultry species and explain the purpose of each part.
	ASA.2.5	Identify and explain the function of the parts of animal systems.
	ASA.2.6	Identify and label and identify the function of the parts of the male and female reproductive tract.
	ASA.2.7	Recognize the advantages and disadvantages of breeding methods.
	ASA.2.8	Determine the best time to breed an animal and manage the breeding system.
ASA.3	**The student will determine and recommend most appropriate and optimal environmental factors associated with animal production for different species.**	
	ASA.3.1	Examine the inputs for livestock production.
	ASA.3.2	Map the regions of commercial animal production.
	ASA.3.3	Explain how the resources available in different regions of the United States support and promote the production of animals.
	ASA.3.4	Research and determine the typical behaviors of a species of animal and become familiar with the safe handling procedures of that animal.
ASA.4	**The student will prepare and implement animal handling procedures for the safety of animals, producers, and consumers of animal products.**	
	ASA.4.1	Investigate the behavior of animals in response to stimuli.
	ASA.4.2	Research and determine the typical behaviors of a species of animal and become familiar with the safe handling procedures of that animal. Recommend safe animal handling to class based on findings.
	ASA.4.3	Determine the average environmental conditions and facility measurements for different species of animals.
ASA.5	The student will demonstrate the skills necessary to provide for the proper health care of animals.	
	ASA.5.1	Produce a list of basic feed, water, and shelter requirements for specific animals.

	ASA.5.2	Categorize feedstuffs into the nutrient group each feedstuff provides.
	ASA.5.3	Classify feedstuffs as roughages, concentrates, and supplements.
	ASA.5.4	Read a label and interpret the information included on the label.
	ASA.5.5	Compare the information on a feed label to the information found on a food label.
	ASA.5.6	Define the differences of infectious, contagious, and non-infectious diseases.
	ASA.5.7	Simulate the spread of a contagious disease and trace the route the disease takes through a population.
	ASA.5.8	Use a template to create Diagnosing Disease cards to help producers manage their animals.
	ASA.5.9	Identify and diagram the life cycle of a common parasite that could infect your animal production.
ASA.6	**The student will select animal facilities and equipment that provide for the safe and efficient production, housing, and handling of animals.**	
	ASA.6.1	Research the basic feed, water, and shelter requirements for animals.
	ASA.6.2	Determine the average environmental conditions of facility locations and how that affects different animals during different seasonal times of year.
	ASA.6.3	Determine and select a type of animal facility that provides for the safe handling and efficient production of animals.
	ASA.6.4	Design and/or construct an animal facility. Calculate proportions, scale ratios, and dimensions of building plans.
ASA.7	**The student will apply principles of animal nutrition to ensure the proper growth, development, reproduction, and economic production of animals.**	
	ASA.7.1	Label, identify, and explain the function of various parts of animal digestive systems.
	ASA.7.2	Match livestock species with the proper digestive system.
	ASA.7.3	Build a model of a digestive system.
	ASA.7.4	Identify the six classes of nutrients, the function they serve in the body, and sources of each nutrient.
	ASA.7.5	Evaluate nutrient requirements of various animals at different stages of production.
	ASA.7.6	Create a presentation outlining nutritional disorders of a species of animal.
	ASA.7.7	Formulate a ration and create a recipe using the Pearson Square.
	ASA.7.8	Use the pearson square to balance a ration using two feedstuffs.

Glenwood Community High School
Introduction to Veterinary Science Curriculum
Approved Date - February 2018

Course Purpose: The student will be informed of base knowledge to focus on topics ranging from basic physiology to classification of diseases and understanding of animal systems. Safety and sanitation are big components to veterinary clinical settings to focus on pet and animal care for those that need assistance of a medical doctor or veterinarian assistant.

Course Outcomes	Outcome Components	Description
IVS.1	**The student will describe the properties, locations, functions, and varieties of tissues.**	
	IVS.1.1	Describe the properties, locations, functions, and varieties of epithelial tissues.
	IVS.1.2	Describe the properties, locations, functions, and varieties of connective tissues.
	IVS.1.3	Describe the properties, locations, functions, and varieties of muscle tissues.
IVS.2	**The student will describe the functions of the animal systems and describe locations of animal external and internal structures to determine appropriate animal health care.**	
	IVS.2.1	Describe external organ structures and function in order to formulate appropriate treatment plan. (External organ structures will vary by species.)
	IVS.2.2	Describe the anatomy and functions of musculoskeletal system in order to formulate appropriate treatment plan.
	IVS.2.3	Describe the anatomy and functions of circulatory system in order to formulate appropriate treatment plan.
	IVS.2.4	Describe the anatomy and functions of respiratory system in order to formulate appropriate treatment plan.
	IVS.2.5	Describe the anatomy and functions of digestive and urinary systems (renal) in order to formulate appropriate treatment plan.
	IVS.2.6	Describe the anatomy and functions of the reproductive and endocrine systems in order to formulate appropriate treatment plan.
IVS.3	**The student will examine animal scenarios and apply problem solving techniques for appropriate animal care.**	
	IVS.3.1	Explain the clinical significance of the basic principles of aseptic technique, disinfectants, sterilization; identify surgical equipment, successful surgery.
	IVS.3.2	Identify appropriate bandaging for animal wounds and identify improper bandaging and how to solve the problem.
	IVS.3.3	Prepare a wound and complete a continuous suture, non-continuous suture, and purse- string suture method.
	IVS.3.4	Outline safety procedures and physical restraint for working with animals by species.
IVS.4	**The student will recognize and describe general indicators of health in order to formulate plans to prevent disease, maintain health, and treat unhealthy conditions.**	
	IVS.4.1	Describe the characteristics of a healthy animal within the categories of body mass, skin conditions, body temperature, pulse rate, and respiration rate.
	IVS 4.2	Describe the signs of an unhealthy animal within the categories of body mass, skin conditions, body temperature, pulse rate, and respiration rate.
	IVS.4.3	Identify the basic principles of disease prevention.
	IVS 4.4	Formulate plans for animal care that promote and sustain animal health.
	IVS 4.5	Formulate plans for animal care that would appropriately treat animals in a variety of unhealthy scenarios.

IVS.5	**The student will differentiate between categories of disease in order to develop prevention and treatment plans.**	
	IVS.5.1	Differentiate between healthy indicators in small and large animal species.
	IVS.5.2	Differentiate between the health needs of animals based upon where they are in the production cycle.
	IVS.5.3	Describe the types of vaccines available and their roles in disease prevention.
	IVS.5.4	Describe a variety of diseases with the domestic species in which they occur.
	IVS.5.5	Analyze factors that influence disease as well as factors that cause a disease.
	IVS.5.6	Explain the path a disease takes and how it affects various body systems.
	IVS.5.7	Compare types of treatments available and how to utilize those treatments.
IVS.6	**The student will apply common Greek and Latin prefixes, suffixes, and roots to the language and terminology of veterinary medicine.**	
	IVS.6.1	Apply appropriate medical terminology for external anatomy of animals.
	IVS.6.2	Apply appropriate medical terminology used to describe direction and surface.
	IVS.6.3	Analyze veterinary terms to define their meanings.
	IVS.6.4	Recognize common Greek and Latin prefixes, suffixes, and roots.
	IVS.6.5	List abbreviations commonly used in veterinary medicine.

Glenwood Community High School
Welding Curriculum

Course Purpose: The student will perform basic level welding techniques and skills.

Course Outcomes	Outcome Components	Description
W01	**The student will demonstrate proper safety procedures for daily shop welding processes.**	
	W01.1	Identify proper setup for different welding procedures.
	W01.2	Identify proper shut down for different welding procedures.
	W01.3	Identify and wear appropriate clothing for lab/shop activities.
	W01.4	Operate lab equipment according to safety guidelines.
W02	**The student will apply shielded metal arc welding techniques.**	
	W02.1	Identify and explain different types of welding current and polarity.
	W02.2	Perform safety inspections of SMAW equipment and accessories.
	W02.3	Perform bead and butt welding joint.
W03	**The student will apply gas metal arc welding techniques.**	
	W03.1	Identify and explain the use of GMAW equipment.
	W03.2	Perform bead and butt welding joint with filler material.
	W03.3	Demonstrate safe startup, shutdown, disassembly, and cylinder exchange procedures of GMAW equipment.
W04	**The student will apply metal inert gas welding techniques.**	
	W04.1	Identify and explain the use of MIG equipment.
	W04.2	Produce bead and butt welding joint.

Glenwood Community High School
Horticulture Curriculum

Course Purpose: This class is an examination of fundamental horticulture principles, from careers in the field to the cultivation of specific crops.

Course Outcomes	Outcome Components	Description
H01	**The student will analyze situation, use problem-solving approach and make appropriate decisions.**	
	H01.1	Use observational techniques to identify healthy, quality plants.
	H01.2	Adjust or control closed environmental factors: water, heat, cold, humidity, air circulation, and ventilation.
H02	**The student will apply knowledge of plant classification, plant anatomy, and plant physiology to the production and management of plants.**	
	H02.1	Choose plants of appropriate mature size, shape, texture, and function for a given site.
	H02.2	Label and understand basic plant parts
H03	**The student will understand and apply the basics of plant science.**	
	H03.1	Explain factors affecting plant growth: light, water, temperature, humidity, nutrients, soil, atmosphere, and pollutants.
	H03.2	Explain the principles of nutrient uptake.
	H03.3	Define and identify hardiness zones
	H03.4	Explain plant propagation from seed, cuttings, divisions, layering, and tissue culture.
H04	**The student will apply technical skills in a hands-on experiential setting in agriculture.**	
	H04.1	Take soil samples, fertilize media and soil based on test results, and prepare soil media.
	H04.2	Prepare and transplant seedlings, cuttings, daughter plants, and perennials for container production.
H05	**The student will identify safety standards for using equipment.**	
	H05.1	Match hand tools to their function.
	H05.2	Explain how to properly maintain and store hand tools.
H06	**The student will showcase elements of design.**	
	H06.1	Explain the benefits of landscaping and landscape planning.
	H06.2	Discuss the elements of design
	H06.3	Determine how plants are selected for a landscape.
	H06.4	Discuss the principles of design.
	H06.5	Understand the steps to develop a landscape design plan.
H07	**The student will take care of plants indoors and prepare for transplant.**	
	H07.1	Describe plant containers and the factors used in selecting plant containers.
	H07.2	Identify signs that indicate repotting is needed.

Glenwood Community High School
Advanced Ag I Curriculum
Approved Date - December 2018

Course Purpose: The student will be informed of the role Agriculture plays in the world pertaining to animal and plant Science higher level skill sets to be applied to real world applications necessary to care for animals, plants, and Agricultural industry as a whole.

Course Outcomes	Outcome Components	Description
ADAG.1	**The student will demonstrate skills necessary to provide for the proper health care of animals.**	
	ADAG.1.1	Recognize the costs associated with improper animal care
	ADAG.1.2	Utilize best practice protocols based upon animal behaviors for animal husbandry and welfare.
	ADAG.1.3	Identify common parasites and diseases that affect livestock.
	ADAG.1.4	Illustrate the lifecycle of common internal and external parasites.
	ADAG.1.5	Create animal health plan, outlining the signs and symptoms of good and poor animal health.
	ADAG.1.6	Define the differences of infectious, contagious, and non-infectious diseases.
	ADAG.1.7	Simulate the spread of a contagious disease and trace the route the disease takes through a population.
	ADAG.1.8	Use a template to create Diagnosing Disease cards to help producers manage their animals.
	ADAG.1.9	Identify and diagram the life cycle of a common parasite that could infect your animal production.
ADAG.2	**The student will evaluate and select animals based on scientific principles of animal production.**	
	ADAG.2.1	Apply principles of animal reproduction to achieve desired outcomes for performance, development, and/or economical production. (expected progeny differences and sire summaries)
	ADAG.2.2	Evaluate environmental factors affecting animal performance and implement procedures for enhancing performance and animal health.
	ADAG.2.3	Organize criterion based selection practices for a production animal.
	ADAG.2.4	Develop and share a summary on how to select an animal and evaluation practices used in the process.
ADAG.3	**The student will prepare and implement animal handling procedures for the safety of animals, producers and consumers of animal products.**	
	ADAG.3.1	Conduct sensory evaluation trials on product samples (dairy and meat) and evaluate the samples. (Grading)
	ADAG.3.2	Compare similar products based on their features, pricing, distribution, and promotion.
ADAG.4	**The student will examine components of the food industry and development of food products and processing.**	
	ADAG.4.1	Compare humane slaughter processes and by-product processing of animals to understand why regulations are in place to protect our food supply.
	ADAG.4.2	Identify differences in meat carcass wholesale and retail cuts.
	ADAG.4.3	Explain the factors that are important for ensuring food safety for our world.
ADAG.5	**The student will use strategic thinking to connect and apply academic learning, knowledge and skills to solve problems in the workplace and community**	

	ADAG.5.1	Distinguish opportunities to apply academic learning to solve problems in the workplace (e.g., identify how to: increase productivity, reduce costs, lower inputs, etc.).
	ADAG.5.2	Assess workplace problems and identify the most appropriate academic knowledge and skills to apply.
	ADAG.5.3	Apply academic knowledge and skills to solve problems in the workplace and reflect upon the results achieved.
	ADAG.5.4	Design and implement a personal financial management plan.
	ADAG.5.5	Research and examine components in a personal financial management plan (e.g., income, expense, budgeting, savings, credit, etc.).
	ADAG.5.6	Analyze management tools available for managing personal finances (e.g., software, calendars, banks, financial institutions, etc.)
	ADAG.5.7	Examine and categorize personal financial practices (e.g., earning, spending, use of management tools, credit, etc.).
	ADAG.5.8	Analyze the effectiveness of a personal financial management plan and explain how this practice may contribute to future financial independence.
	ADAG.5.9	Design, implement and evaluate a personal financial management plan
	ADAG.5.10	Communicate clearly, effectively and with reason. Career-ready individuals communicate thoughts, ideas and action plans with clarity, whether using written, verbal and/or visual methods. Career-ready individuals think about the audience for their communication and prepare accordingly to ensure the desired outcome.
	ADAG.5.11	Speak using strategies that ensure clarity, logic, purpose and professionalism in formal and informal settings
	ADAG.5.12	Produce clear, reasoned and coherent written and visual communication in formal and informal settings.
ADAG.6	**The student will utilize personal development to help plan training or education and career path aligned to personal goals.**	
	ADAG.6.1	Compose a resume.
	ADAG.6.2	Identify skills, physical and emotional requirements for a job.
	ADAG.6.3	Complete required forms. (job application)
	ADAG.6.4	Construct an application letter
ADAG.7	**The student will propagate, culture, and harvest plants.**	
	ADAG.7.1	Compare and contrast asexual and sexual plant reproduction.
	ADAG.7.2	Decide the most appropriate method of asexual reproduction for different types of plant material
	ADAG.7.3	Demonstrate how to perform common asexual propagation methods, such as grafting, budding, layering, division, and cuttings properly.
ADAG.8	**The student will prepare a plant management plan that addresses the influence of environmental factors, nutrients, and soil on plant growth**	
	ADAG.8.1	Create an Integrated Pest Management plan and discuss ways to implement such a plan
	ADAG.8.2	Compare and contrast pest eradication and pest control methods.
	ADAG.8.3	Develop a presentation as a team illustrating the four P's of marketing for each of the plant-based industries.(Product, placement, price, and promotion are the four keys to marketing products)
	ADAG.8.4	Research and develop a business plan proposal utilizing 20 acres of school district property to raise plants
ADAG.9	**The student will demonstrate responsible management procedures and techniques to protect or maintain natural resources.**	
	ADAG.9.1	Assess and implement BMPs (Best Management Practices) related to agricultural drainage wells, erosion control, irrigation of wastewater, irrigation of groundwater, use of storage tanks (i.e., fuels, Anhydrous Ammonia, etc.) and wellhead and source of water protection which improve water quality.
	ADAG.9.2	Evaluate alternative agricultural systems based on productivity, profitability, environmental considerations, and social acceptance.
	ADAG.9.3	Develop an educational display that will describe an alternative energy source and the impact agriculture has on that source.

	ADAG.9.4	Explain common methods for measuring the area of land.
	ADAG.9.5	Compose a legal land description and read legal land descriptions.

Agricultural Courses

Formatted with course purpose statement, outcomes, and components

IWCC dual credit courses will not be included in this format as we cannot change what is provided.

Farm Business Management (this one not needed b/c it is dual credit course)

I. The student will demonstrate competence in the application of practices for businessmanagement.

II. The student will examine the business and economic principles applied to decision making and problem-solving in the management of a farm business.

Survey of the Animal Industry (this one not needed b/c it is a dual credit course)

- Would like to implement thisdual credit course through IWCC for college credit for sophomores thruseniors just as FBM is currently done.
- Can be done in the fall semester and FBM in the spring like it currently is.
- I already took training with Eric Weuve to teach this course

Glenwood Community Middle School
7th Grade PLTW Design & Modeling Curriculum
Approved Date - May 2019

Course ID:	**Course Purpose:** The student will discover the design process and develop an understanding of the influence of creativity and innovation in their lives.

Course Outcomes	Outcome Components	Description
DM.7.1	**The student will construct a definition of an engineer's role.**	
	DM.7.1.1	Describe the relationship between science, technology, engineering, and math.
	DM.7.1.2	Compare and contrast the differences between invention and innovation.
	DM.7.1.3	Describe engineering and explain how engineers participate in or contribute to society.
DM.7.2	**The student will demonstrate the skills essential to design and modeling.**	
	DM.7.2.1	Communicate design ideas effectively without the use of technology through sketching.
	DM.7.2.2	Measure accurately and precisely with different devices.
	DM.7.2.3	Analyze data to evaluate results to determine if their design meets given criteria.
	DM.7.2.4	Transfer two dimensional representations to three dimensional solids using technology.
	DM.7.2.5	Create solid models using a CAD application.
DM.7.3	**The student will implement a solution to a real-world problem by using an engineering design process.**	
	DM.7.3.1	Generate concepts of possible solutions and justify selection of optimal solution.
	DM.7.3.2	Create sketches of chosen solution with or without technology.
	DM.7.3.3	Fabricate/create the chosen solution in some type of media/medium.
	DM.7.3.4	Test the solution and analyze the data to generate possible future steps.
	DM.7.3.5	Evaluate the solution and revisit the design.
	DM.7.3.6	Present solution through a deliverable.

Glenwood Community Middle School
8th Grade PLTW Automation & Robotics Curriculum
Approved Date - May 2019

Course ID:	**Course Purpose:** The student will learn about the history and impact of automation and robotics as they explore mechanical systems, energy transfer, machine automation, and computer control systems.

Course Outcomes	Outcome Components	Description
AR.8.1	**The student will evaluate the impact of automation and robotics in a societal context.**	
	AR.8.1.1	Compare and contrast the concepts of automation and robotics.
	AR.8.1.2	Summarize automation and robotics in today's world and their impact on society.
	AR.8.1.3	Hypothesize how automation and robotics will impact society in the future.
AR.8.2	**The student will construct and evaluate mechanisms by their ability to transfer direction of energy, influence speed and/or torque, and type of motion.**	
	AR.8.2.1	Identify mechanisms that change speed/torque, direction of energy, and type of motion.
	AR.8.2.2	Construct structurally sound mechanisms.
	AR.8.2.3	Evaluate a mechanism's impact on speed, torque, direction, and type of motion.
AR.8.3	**The student will generate code that can perform a specific task using motors and sensors.**	
	AR.8.3.1	Identify proper coding language for motors and sensors.
	AR.8.3.2	Construct code specific to given motors and sensors.
	AR.8.3.3	Sequence code in proper order to complete given tasks.
AR.8.4	**The student will design, build, and program robotic mechanisms to complete a problem based task.**	
	AR.8.4.1	Brainstorm and design a plan for a robotic mechanism to complete a selected task using given materials.
	AR.8.4.2	Build a structurally sound solution for the selected task incorporating mechanisms, sensors, and motors.
	AR.8.4.3	Program a robotic mechanism to complete the selected task.

Glenwood Community Middle School
Introduction to Aerospace Curriculum (Grades: 7-8)
Date Approved - February 2022

Course Description: Introduction to Aerospace applies engineering skills and physics to design, build, and explain different kinds of aircraft and their uses.

Course Outcomes	Outcome Components	Description
Aero.1	**The student will solve a problem by applying the Engineering and Design process.**	
	Aero.1.1	Identify the roles and responsibilities of a STEM professional in the aerospace industry.
	Aero.1.2	Define the steps of the Engineering and design process.
	Aero.1.3	Evaluate design decisions using performance data.
Aero.2	**The student will explain what affects the flight of an object.**	
	Aero.2.1	Explain how an aircraft uses the forces of flight.
	Aero.2.2	Explain how Newton's laws apply to flight.
	Aero.2.3	Describe how center of gravity affects an aerospace vehicle in distributing weight.
	Aero.2.4	Apply the engineering and design process to build a glider.
	Aero.2.5	Identify the major parts of aircraft.
	Aero.2.6	Explain recommended changes to an aircraft of their own design based upon what they have learned about the forces of flight.
Aero.3	**The student will explain what affects the flight of a rocket.**	
	Aero.3.1	Summarize the risks and benefits of different propulsion systems.
	Aero.3.2	Explain the basic principles of rocketry.
	Aero.3.3	Describe how a rocket overcomes the forces of gravity and drag in order to escape the atmosphere.
	Aero.3.4	Apply the engineering and design process to build a rocket.
Aero.4	**The student will plan a manned mission to Mars**	
	Aero.4.1	Summarize the history and development of rocketry, space flight, and space exploration.
	Aero.4.2	Describe challenges that engineers face to provide safe travel and optimum living conditions in space.

	Aero.4.3	Summarize solutions to the challenges of manned space exploration.
	Aero.4.4	Describe the various ways Mars has been explored.
	Aero.4.5	Apply the engineering and design process to build a vehicle to perform a task on Mars.

Glenwood Community High School
Introduction to Engineering Design Curriculum
Approved Date - June 2018

Course Purpose: Introduction to Engineering Design (IED) is a high school level foundation course in the PLTW Engineering Program. In IED the student will be introduced to the engineering profession and a common approach to the solution of engineering problems, an engineering design process. Utilizing the activity-project-problem-based (APB) teaching and learning pedagogy, the student will progress from completing structured activities to solving open- ended projects and problems that require them to develop planning, documentation, communication, and other professional skills.

Course Outcomes	Outcome Components	Description
IED.1	**The Design Process: The student will develop solutions to multiple problems by applying PLTW's Design Process.**	
	IED.1.1	Identify and describe the steps in an engineering design process.
	IED.1.2	Identify and describe multiple brainstorming techniques.
	IED.1.3	Create sketches or diagrams of different objects.
	IED.1.4	Generate and document multiple ideas or solution paths to a problem through brainstorming.
	IED.1.5	Describe the design process used in the solution of a particular problem and reflect on all steps in the process.
	IED.1.6	Create a deliverable explaining the contributions of an engineer or technician in the mathematical/science field.
IED.2	**Technical Sketching and Drawing: The student will create various technical representations used throughout the design process.**	
	IED.2.1	Identify line types used in a technical drawing and explain the purpose of each line.
	IED.2.2	Identify and define technical drawing representations including isometric, orthographic projection, oblique, and perspective.
	IED.2.3	Hand sketch isometric, 1-pt perspective, orthographic projection, and oblique view of a simple object or part of a more difficult object when the scale is given.
	IED.2.4	Sketch a pictorial and give a detailed verbal/written description.
	IED.2.5	Apply tonal shading to enhance the appearance of a pictorial sketch to create a more realistic appearance of a sketched object.
	IED.2.6	Choose and justify the choice for the front view in an orthographic projection.
IED.3	**Measurement and Statistics: The student will learn and apply appropriate methods of making and recording measurements, describe the difference between precision and accuracy, and use descriptive and inferential statistics to make informed decisions.**	
	IED.3.1	Measure linear distances with accuracy using a ruler and dial caliper.
	IED.3.2	Convert measurements within and between the metric and US customary systems.
	IED.3.3	Identify and use general rules for dimensioning on technical drawings used in standard engineering practice.
	IED.3.4	Identify and correct errors and omissions in the dimensions applied in a technical drawing.
	IED.3.5	Calculate measure of central tendency. (Mean, median, mode, range, sample standard deviation)
	IED.3.6	Use statistics to quantify information, support design decision, and justify problem solutions.
	IED.3.7	Store, manipulate, and display data using a spreadsheet program.

	IED.3.8	Evaluate and compare the accuracy and precision of different measuring devices.
IED.4	**Modeling Skills: The student will create graphical 3D computer models of design ideas using sketches and engineering drawings and use mathematical functions to explain relationships between two quantities.**	
	IED.4.1	Develop and/or use graphical, computer, physical and mathematical models as appropriate to represent or solve problems.
	IED.4.2	Create three-dimensional solid models of parts within CAD from sketches or dimensioned drawings using appropriate geometric and dimensional constraints.
	IED.4.3	Construct a testable prototype of a problem solution.
	IED.4.4	Create a set of working drawings to detail a design project.
	IED.4.5	Evaluate a function for inputs in its domain and interpret statements that use function notation in terms of a context.
	IED.4.6	Compare the efficiency of the modeling method of an object using different combinations of additive and subtractive methods of creating three-dimensional models.
IED.5	**Geometry of Design: The student will calculate the area of two-dimensional shapes, the surface area, volume, and weight of three-dimensional solids and the interaction of volume and weight to determine material density. Students will also use CAD modeling software to enhance their understanding of plane and solid geometry.**	
	IED.5.1	Identify types of polygons and other common shapes and be able to match with the correct formula to find its area.
	IED.5.2	Solve real world and mathematical problems involving area, surface area, and volume of two- and three-dimensional objects.
	IED.5.3	Create three-dimensional solid models of parts within CAD from sketches or dimensioned drawings using appropriate geometric and dimensional constraints and model features.
	IED.5.4	Measure mass and volume with accuracy and report the measurement with an appropriate level of precision.
	IED.5.5	Calculate a physical property using available data or perform appropriate measurements to gather the necessary data (e.g., determine area or volume using linear measurements or determine density using mass and volume measurements).
	IED.5.6	Use the capabilities of the CAD software to determine the mass, volume, surface area, and density of an object for which a 3D solid model has been created.
IED.6	**Reverse Engineering: The student will perform a functional analysis through non-destructive methods of observation and generate hypotheses of the sequential operations of their products, and identify the inputs and outputs that are indicative of those systems. The student will also physically disassemble a product and document the constituent parts, their properties, and their operation with the intent of providing students with a better understanding of the product's strengths, weaknesses and the manufacturing processes used in manufacturing.**	
	IED.6.1	Identify and describe the visual elements, principles, and elements of design apparent in a natural or man-made object.
	IED.6.2	Explain the various reasons to perform reverse engineering including discovery, documentation, investigation, and product improvement.
	IED.6.3	Perform a functional analysis of a product in order to determine the purpose, inputs and outputs, and the operation of a product or system.
	IED.6.4	Perform a structural analysis of a product in order to determine the materials used, the form of component parts, and the configuration and interaction of component parts when assembled.
	IED.6.5	Document and present findings that resulted by going through the reverse engineering process on a product.
IED.7	**Documentation: The student will use drafting, dimensioning, and tolerancing standards to communicate designs and models to others.**	
	IED.7.1	Identify and correctly apply size, location, chain, and datum dimensions.
	IED.7.2	Identify the shapes of two-dimensional cross sections of three-dimensional objects.
	IED.7.3	Read and interpret a hole note to identify the size and type of hole including through, clearance, blind, counterbore, and countersink holes.

	IED.7.4	Identify and differentiate among limit dimensions, a unilateral tolerance, a bilateral tolerance, clearance fit, and interference fit.
	IED.7.5	Explain each assembly constraint (including mate, flush, insert, and tangent), its role in an assembly model, and the degrees of freedom that it removes from the movement between parts.
	IED.7.6	Hand sketch a scaled full or half section view in the correct orientation to fully detail an object or part when given the actual object, a detailed verbal description of the object, a pictorial view of the object, or a set of orthographic projections.
	IED.7.7	Generate and dimension a section view using CAD according to standard engineering practice.
	IED.7.8	Create specific notes on a technical drawing to convey important information about a specific feature of a detailed object, and create general notes to convey details that pertain to information presented on the entire drawing (such as units, scale, patent details, etc.).
	IED.7.9	Determine the specified dimension, tolerance, upper limit, and lower limit for any given dimension and related tolerance (or any distance that is dependent on given dimensions) shown on a technical drawing.
	IED.7.10	Define and justify a design problem. Express the concerns, needs, and desires of the primary stakeholders. Jointly develop a decision matrix based on accepted outcome criteria and constraints.
IED.8	**Advanced Computer Modeling: The student will use advanced modeling skills to develop design solutions to various projects and problems.**	
	IED.8.1	Identify, define, and explain the proper use of an auxiliary view in technical drawing.
	IED.8.2	Use advanced modeling features to create three-dimensional solid models of complex parts and assemblies within CAD.
	IED.8.3	Create an exploded assembly view of a multi-part product. Identify each component of the assembly with identification numbers and create a parts list to detail each component using CAD.
	IED.8.4	Perform a peer review of technical drawings and offer constructive feedback based on standard engineering practices.
IED.9	**Design Team: The student will experience shared decision-making as they investigate different materials, manufacturing processes, and the short and long term impacts that their decision-making may have on society or potentially on the world.**	
	IED.9.1	Identify and describe the steps of a typical product lifecycle (including raw material extraction, processing, manufacture, use and maintenance, and disposal).
	IED.9.2	Identify and explain how the basic theories of ethics relate to engineering.
	IED.9.3	Assess the development of an engineered product and the impact of the product on society and the environment.
	IED.9.4	Identify appropriate technology to support remote collaboration among virtual design team members.
	IED.9.5	Document correspondence and conversations in an accurate and organized manner.
	IED.9.6	Create and utilize a Gantt chart to plan, monitor, and control task completion during a design project.
IED.10	**Design Challenge: The student will work in pairs to apply the design process to create a solution to a chosen problem.**	
	IED.10.1	Identify, define, and explain the proper use of an auxiliary view in technical drawing.
	IED.10.2	Develop and document an effective solution to a problem that meets specific design requirements.
	IED.10.3	Document and describe the design process used in the solution of a problem and reflect on all steps of the design process.

Glenwood Community High School
Principles of Engineering Curriculum

Course ID: POE	**Course Purpose:** The student in Principles of Engineering will investigate engineering and high tech careers by completing project and problem based learning. Topics are related to energy and power, material properties, software controlled mechanical processes, and data analysis.

Course Outcomes	Outcome Components	Description
POE.1	**The student will use math and science skills to investigate machines.**	
	POE.1.1	Differentiate among the different engineering careers.
	POE.1.2	Describe and calculate the mechanical advantage of the six simple machines.
	POE.1.3	Calculate gear ratios in simple and compound gear trains as well as sprocket and chain systems.
	POE.1.4	Calculate work, power, and efficiency in a mechanical system.
	POE.1.5	Design, create, test, and evaluate a compound machine using annotated sketches and other documentation.
POE.2	**The student will research types of energy and use formulas to calculate the amount of energy in a system.**	
	POE.2.1	Research different types of energy within renewable and non-renewable.
	POE.2.2	Use a digital multimeter as a voltmeter, Ohmmeter, or ammeter.
	POE.2.3	Calculate electrical power developed in a circuit, including resistance, current, and voltage using Ohm's law in series and parallel circuits.
	POE.2.4	Calculate mechanical power developed when lifting an object.
	POE.2.5	Determine efficiency in a system which converts electrical energy into mechanical energy.
POE.3	**The student will use alternative energies to power machines.**	
	POE.3.1	Describe how hydrogen fuel cells transform energies.
	POE.3.2	Describe the use of reversible fuel cells for storage.
	POE.3.3	Use solar panels, DC power supplies, and hydrogen fuel cells to design and build a VEX car.
	POE.3.4	Identify the different types of thermal energy transfer.
	POE.3.5	Calculate the rate at which energy is transferred by conduction and radiation through materials using R-values.
	POE.3.6	Design, construct, and test insulation materials for reducing thermal energy transfer.
POE.4	**The student will compute and investigate different properties of statics.**	
	POE.4.1	Research and write about the job responsibilities of one type of engineer or engineering technician.
	POE.4.2	Use mathematical equations to calculate the centroid or structural members.
	POE.4.3	Differentiate between scalar and vector quantities.
	POE.4.4	Identify magnitude, direction, and sense of a vector.
	POE.4.5	Calculate the x- and y- components of a vector.
	POE.4.6	Create free-body diagrams which identify all forces acting upon an object.
	POE.4.7	Calculate the area and moment of inertia of structural members.

	POE.4.8	Calculate the deflection of a center-loaded beam from the beam's geometry and material properties.
	POE.4.9	Calculate moments (or torque) given a force and a point of application relative to an axis.
	POE.4.10	Use equations of equilibrium to calculate unknown external forces on a truss.
	POE.4.11	Calculate compression and tension forces on a statically determinate truss.
	POE.4.12	Construct and destructively test a truss; relate observations to calculated predictions.
POE.5	**The student will investigate and test common household items for recyclability.**	
	POE.5.1	Research different recycling codes at the local, state, and national level.
	POE.5.2	Investigate specific material properties relate to household objects.
	POE.5.3	Conduct non-destructive tests for material properties including test for continuity, ferrous metal, hardness, and flexure.
	POE.5.4	Measure or calculate weight, volume, mass, density, and surface area of selected household items.
	POE.5.5	Research and write about the manufacturing process of a selected household objects.
	POE.5.6	Identify objects which can or cannot be recycled.
POE.6	**The student will investigate the durability of materials.**	
	POE.6.1	Distinguish between plastic and elastic deformation.
	POE.6.2	Describe the relationship between the tensile force applied and the elongation.
	POE.6.3	Calculate minimum and or maximum design parameters to ensure a safe and reliable product.
	POE.6.4	Measure axial force and elongation data of material samples and create stress-strain calculations.
	POE.6.5	Identify and calculate test-sample material properties using a stress-strain curve.
	POE.6.6	Use West Point Bridge Designer (or a similar program) to build a bridge under specific specifications.
POE.7	**The student will use logic and computer programming software to control machines.**	
	POE.7.1	Identify the market need and salary for an engineer in this discipline.
	POE.7.2	Distinguish between analog and digital data and between inputs and outputs of a computational system.
	POE.7.3	Distinguish open and closed loop systems based on whether decisions are made using time delays or sensor feedback.
	POE.7.4	Choose appropriate input and output devices based on need.
	POE.7.5	Create flowcharts and pseudocode for an algorithm.
	POE.7.6	Create a computer program to implement algorithms, to include conditional statements, iterations, and variables.
	POE.7.7	Use a variety of methods for finding, identifying, and correcting bugs in a program.
	POE.7.8	Design and create a control system based on needs and constraints.
	POE.7.9	Design and create a material sorter.
POE.8	**The student will investigate hydraulic and pneumatic power systems.**	
	POE.8.1	Identify devices that utilize hydraulic and pneumatic power.
	POE.8.2	Compare, contrast hydraulic and pneumatic power systems.
	POE.8.3	Distinguish between pressure, absolute pressure, temperature, and absolute temperature.

	POE.8.4	Distinguish between hydrodynamic and hydrostatic systems.
	POE.8.5	Design, create, and test a hydraulic device.
	POE.8.6	Design, create, and test a pneumatic device.
	POE.8.7	Calculate design parameters in fluid power using Pascal's Law.
	POE.8.8	Calculate values in a pneumatic system using ideal gas laws.
	POE.8.9	Calculate flow rate, flow velocity, power, and mechanical advantage in a fluid power system.
POE.9	**The student will use probability and statistics to investigate and make predictions on a set of data.**	
	POE.9.1	Name and calculate the measures of central tendency that include variation and standard deviation.
	POE.9.2	Calculate theoretical probability of a simple event.
	POE.9.3	Produce a frequency distribution to describe experimental results.
	POE.9.4	Calculate the probability of making a set of observations in a series of trials where each trial has two distinct possibilities.
	POE.9.5	Apply AND, OR, and NOT logic to probability.
	POE.9.6	Apply Bayes' Theorem to calculate probability in a manufacturing context.
POE.10	**The student will investigate the properties of ballistics.**	
	POE.10.1	Calculate distance, displacement, speed, velocity, and acceleration from data.
	POE.10.2	Design, build, and test a machine that efficiently channels mechanical energy when friction and limited input energy are significant constraints.
	POE.10.3	Calculate acceleration due to gravity given data from a free fall trajectory.
	POE.10.4	Calculate the x- and y- components of projectile motion.
	POE.10.5	Determine the angle needed to launch a projectile a specific range given the initial velocity.

Glenwood Community High School
Civil Engineering and Architecture Curriculum

Course Purpose: The major focus of the CEA course is to expose students to the design and construction practices of residential and commercial building projects, design teams and teamwork, communication methods, building codes and ordinances, engineering design calculations, and technical documentation.

Course Outcomes	Outcome Components	Description
CEA 1	**The student will use the foundation of civil engineering and architecture to identify potential careers and related perspectives.**	
	CEA.1.1	Differentiate between civil engineering and architecture.
	CEA.1.2	Organize prospective careers as they venture through the remainder of the course.
CEA.2	**The student will use a variety of views to document and detail a building project on construction drawings.**	
	CEA.2.1	List common building practices and terminology.
	CEA.2.2	Compile common costs of construction.
	CEA.2.3	Design an affordable home for a client using sustainable practices.
CEA.3	**The student will use a variety of views to document and detail a commercial building project.**	
	CEA.3.1	Categorize the types of commercial building usage.
	CEA.3.2	Apply the appropriate engineering principles necessary to support the final building project.
	CEA.3.3	Identify internal systems such as water supply, drainage, power, heating, ventilating, and air conditioning.
	CEA.3.4	Identify land surveys and soil analyses necessary to support the final building project.
CEA.4	**The student will effectively and collaboratively participate on a design team to complete a building design.**	
	CEA.4.1	Provide working drawings and designs for the final project.
	CEA.4.2	Collaborate to solve issues within the design process.
	CEA.4.3	Finish assigned tasks for the completion of the project.
	CEA.4.4	Propose the design solution to a panel of experts.

Glenwood Community High School
Principles of Technology Curriculum

Course Purpose: The student will collaborate to analyze and perform appropriate technical equipment measurements in mechanical, fluid, electrical and thermal systems. They will determine various information by analyzing the variety of lab equipment provided in the course.

Course Outcomes	Outcome Components	Description
IA.PTI.1	**The student will describe what force, pressure, voltage and temperature difference have in common and be able to measure them in mechanical, fluid, electrical and thermal systems.**	
	IA.PTI.1.1	Determine what units of measurement are used in the English and System of International for mechanical force and related force terms.
	IA.PTI.1.2	Determine the difference between hydraulic and pneumatic fluid systems and measure pressure with various measurement equipment.
	IA.PTI.1.3	Differentiate the differences and similarities between AC and DC voltage and be able to measure each.
	IA.PTI.1.4	Identify and determine the measurement of thermal energy and distinguish the difference between temperature and temperature difference.
IA.PTI.2	**The student will describe what is meant by work in mechanical, fluid, and thermal systems and determine how to measure the various factors.**	
	IA.PTI.2.1	Determine and explain the relationship between work done on an object, the force applied, the distance an object moves, and calculate the efficiency.
	IA.PTI.2.2	Determine fluid work and density measurements to solve fluid problems and use various fluid measuring devices.
	IA.PTI.2.3	Determine electrical work units and solve for input, output and efficiency and use the proper electrical measurement devices in a safe manner.
IA.PTI.3	**The student will describe what is meant by rate in mechanical, fluid, electrical and thermal systems and be able to measure rate with the proper equipment.**	
	IA.PTI.3.1	Calculate and measure various linear and rotational rates with the proper equipment.
	IA.PTI.3.2	Determine volume--flow and mass--flow rates with the proper equipment.
	IA.PTI.3.3	Distinguish the difference between AC and DC currents and calculate and determine the measurement of amperage in various circuits.
	IA.PTI.3.3	Determine the correct heat--flow rate units in the English and SI systems and use the proper thermal equipment to measure it.
IA.PTI.4	**The student will describe what is meant by resistance in mechanical, fluid, electrical and thermal systems and identify workplace applications.**	
	IA.PTI.4.1	Identify sources of resistance in mechanical systems and describe the difference between friction and drag resistance.
	IA.PTI.4.2	Identify sources of resistance of a fluid flowing through a pipe and calculate fluid resistance.
	IA.PTI.4.3	Calculate electrical resistance in series and parallel circuits.
	IA.PTI.4.4	Identify factors that affect thermal resistance and be able to measure thermal resistance of a substance.

Glenwood Community High School
Principles of Technology II Curriculum

Course Purpose: The student will compare, analyze and manipulate various industrial equipment and practices. They will determine uses in industry and/or the trades.

Course Outcomes	Outcome Components	Description
IA.PTII.1	**The student will describe what's meant by power in mechanical, fluid, electrical and thermal systems. Identify workplace applications where technicians measure or control power.**	
	IA.PTII.1.1	Describe and identify units of power in mechanical systems, Measure power with various tools and determine efficiency from the output/input variables.
	IA.PTII.1.2	Determine the fluid power of a machine and use the equation for power and identify workplace applications where technicians measure or control power in fluid systems.
	IA.PTII.1.3	Determine the units for electrical power and be able to use the electrical variables to solve the equation for electrical power. List workplace applications where technicians measure or control power in electrical systems.
IA.PTII.2	**The student will describe what a force transformer is in general and be able to list examples of force transformers in mechanical, fluid, and electrical systems.**	
	IA.PTII.2.1	List the 6 simple machines and determine the proper units for input, output, and efficiency and determine the Ideal Mechanical Advantage and Actual Mechanical Advantage of various machines in the workplace.
	IA.PTII.2.2	Determine the input and output of a hydraulic jack compared to a pressure intensifier and identify workplace applications in fluid systems.
	IA.PTII.2.3	Determine whether an electrical transformer is a "step-up" or "step-down" transformer and determine the efficiency and list uses of electrical transformers.
IA.PTII.3	**The student will describe the purpose of an energy convertor and be able to identify the various types of mechanical, fluid, electrical, and thermal energy convertors.**	
	IA.PTII.3.1	Describe a mechanical energy convertor, determine the efficiency, and identify workplace applications where technicians use and control mechanical energy convertors.
	IA.PTII.3.2	Describe a fluid energy convertor, determine how fluid convertors change their energy into mechanical, electrical, and thermal energy and identify common workplace applications.
	IA.PTII.3.3	Describe how an electrical energy converts its energy into mechanical, fluid, and thermal energy, determine the efficiency of electrical energy convertors, and list some workplace applications where technicians use and control electrical energy.
	IA.PTII.3.4	Describe a thermal energy convertor, determine the efficiency of thermal converters, and identify some workplace applications where technicians control thermal energy convertors.
IA.PTII.4	**The student will list the factors needed to determine linear and angular momentum and the relationship between impulse and momentum.**	
	IA.PTII.4.1	Identify the appropriate units to calculate linear momentum and impulse and identify workplace applications where technicians will measure or control momentum.

	IA.PTII.4.2	Identify the factors needed to determine angular momentum and impulse and list some workplace applications where technicians measure or control angular momentum.
IA.PTII.5	**The student will perform various applications with industrial equipment and determine the advantages and disadvantages for each of the systems.**	
	IA.PTII.5.1	CNC Mill: Demonstrate programming, editing, and milling various machine parts on the CNC milling machine.
	IA.PTII.5.2	Digital Electronics: Become familiar with the binary system and demonstrate applications of AND, OR, NOR, NAND gates and digital inverters.
	IA.PTII.5.3	Robotics: Demonstrate the principles of robotic applications by writing, saving, and editing of a pick and place program.
	IA.PTII.5.4	Pneumatics: Perform various pneumatic principles by demonstrating them on the training equipment and be able to recognize the similarities and differences between hydraulic applications.
	IA.PTII.5.5	Hydraulics: Perform various hydraulic principles by demonstrating them on the training equipment and be able to recognize the similarities and differences between pneumatic applications.
	IA.PTII. 5.6	Fiber Optics: Demonstrate various applications and techniques with the fiber optics and various sensors provided on the training equipment.
	IA.PTII.5.7	Automotive Electronics: Demonstrate various situations on the electronics trainer that may occur in the automobile electronic industry in a safe prescribed manner.
	IA.PTII.5.8	LASER: Demonstrate various LASER characteristics and applications with the lab equipment in a safe and prescribed manner.

Glenwood Community High School
Industrial Arts Curriculum

Course Purpose: The student will demonstrate basic levels of drafting and woodworking techniques and skills used to produce mechanical drawings and a wood project.

Course Outcomes	Outcome Components	Description
IA.1	**The student will demonstrate and use basic drafting techniques.**	
	IA.1.1	Use and maintain drafting equipment.
	IA.1.2	Use architectural scale as a measuring tool.
	IA.1.3	Identify and draw various line types.
	IA.1.4	Demonstrate correct lettering techniques.
	IA.1.5	Create drawings.
	IA.1.6	Demonstrate basic geometric construction.
	IA.1.7	Create orthographic views.
	IA.1.8	Solve math problems related to drafting.
	IA.1.9	Identify drafting career pathways.
IA.2	**The student will apply the basic safety and safe operating procedures necessary to the woodworking shop.**	
	IA.2.1	Identify woodworking machine parts.
	IA.2.2	Demonstrate shop and equipment safety rules.
	IA.2.3	Produce a practice project to show safe tool and machine operations.
IA.3	**The student will produce a woodworking project.**	
	IA.3.1	Make plans to create a wood project.
	IA.3.2	Utilize math skills related to the project to dimension and produce the project.
	IA.3.3	Operate and maintain a safe work area.
	IA.3.4	Identify a woodworking career pathway.
	IA.3.5	Use time and materials efficiently and effectively to produce a wood project.

Glenwood Community High School
Wood Production Curriculum

Course Purpose: The student will demonstrate proper techniques of project development, safety, and construction techniques.

Course Outcomes	Outcome Components	Description
WP.1	**The student will apply the proper safety techniques and operation of the woodworking shop equipment.**	
	WP.1.1	Assess the work area and equipment for a safe working environment.
	WP.1.2	Demonstrate proper shop and equipment safety rules.
WP.2	**The student will demonstrate proper production techniques.**	
	WP.2.1	Rate blueprints.
	WP.2.2	Produce project plans.
	WP.2.3	Utilize technical math skill, to produce project designs.
WP.3	**The student will apply the fundamentals of wood manufacturing process.**	
	WP.3.1	Use and setup woodworking machines.
	WP.3.2	Demonstrate proper usage and storage of lab tools.
	WP.3.3	Use computer numerical control to produce a wood product.
WP.4	**The student will demonstrate fabrication and finishing techniques.**	
	WP.4.1	Identify woodworking joints.
	WP.4.2	Demonstrate proper finishing procedures.
	WP.4.3	Show proper joint techniques.
	WP.4.4	Create a project using proper woodworking techniques.

Glenwood Community High School
Woodworking Curriculum

Course Purpose: The student will demonstrate advanced levels of project development, woodshop safety, and construction techniques.

Course Outcomes	Outcome Components	Description
WW.1	**The student will demonstrate proper safe operating procedures.**	
	WW.1.1	Create safety assessments.
	WW.1.2	Inspect work space for safe work environment.
	WW.1.3	Demonstrate safety procedure.
WW.2	**The student will develop procedures necessary for a woodworking project.**	
	WW.2.1	Create plans for a woodworking project.
	WW.2.2	Create a parts list for a woodworking project.
	WW.2.3	Create a bill of material for a woodworking project.
WW.3	**The student will apply the appropriate methods and techniques to construct a woodworking project.**	
	WW.3.1	Identify woodworking joints.
	WW.3.2	Utilize proper glue and clamping techniques.
	WW.3.3	Use proper interior finishes.
WW.4	**The student will collect career pathway information.**	
	WW.4.1	Compare professional and non-professional careers.
	WW.4.2	Outline a career pathway.

Glenwood Community High School
Career Transitions Curriculum

Course Purpose: The student will determine, create, analyze and demonstrate appropriate employment documents for job--seeking, job--getting, job--keeping, and life--on--your skills.

Course Outcomes	Outcome Components	Description
IA.CT.1	**Job Seeking Skills:** **The student will describe various sources of finding a job opening, use of networking and become familiar with some pre-employment tests businesses uses as employment tools.**	
	IA.CT.1.1	List sources to help find a job opening and determine which ones give the best results.
	IA.CT.1.2	Explain networking as to how it applies to getting a job and set up their own networking system.
	IA.CT.1.3	Answer some pre-employment tests such as True Colors, the Holland test, Attitude Inventory and math skills tests.
IA.CT.2	**Job Getting Skills:** **The student will prepare applications, letters of application, resumes, references, and become prepared for a mock interview.**	
	IA.CT.2.1	Fill out various employment applications and recognize some of the problems that cause employers to disregard some applications.
	IA.CT.2.2	Prepare a letter of application to an employer and why accuracy is a valued asset.
	IA.CT.2.3	Determine which resume format will work best for them and prepare a useable up to date resume and reference sheet.
	IA.CT.2.4	Become familiar and prepare for a mock job interview.
	IA.CT.2.5	Determine some of the follow--up skills needed after the interview has taken place. Prepare a thank you for the interview business letter.
IA.CT.3	**Job Keeping Skills:** **The student will become familiar with workplace evaluations, midwestern work ethic, and various workplace situations that can be a positive or negative influence to your employer.**	
	IA.CT.3.1	Determine their performance from various samples of employer evaluations.
	IA.CT.3.2	Discuss workplace situations that cause a positive or adverse effect to employees and explain how to handle various confrontational situations.
	IA.CT.3.3	Set up a job shadowing experience in the career area they have the strongest desire to enter.
IA.CT.4	**Business Information:** **The student will describe some of the issues, problems and types of business ownerships they may experience either as an employee or business owner.**	
	IA.CT.4.1	Understand some of the ethical issues they may face as an employee or business owner, such as: honesty, integrity, responsibility, empathy, respect, loyalty and confidentiality.
	IA.CT.4.2	Become familiar with various legal terminology used in the court system such as: civil, criminal, city, county, state, and federal charges regarding workplace issues.
	IA.CT.4.3	List the various business ownerships there are and determine the advantages and disadvantages of sole proprietorships, partnerships, and corporations.
	IA.CT.4.4	Use various company research sites to find company information about an assigned company and determine relevant information prior to a job interview.
	IA.CT.4.5	Set up a job shadowing experience in the career area they have the strongest desire to enter.
IA.CT.5	**Living on your own:** **The student will describe and understand various terms, decisions, and procedures made by them when they purchase insurance, obtain a loan for a car or home and decide to move away from home and the expenses that they may incur.**	

	IA.CT.5.1	Understand the various insurance related terminology used in the insurance industry make sound decisions when purchasing or upgrading their own insurance needs.
	IA.CT.5.2	Determine the monthly payments for cars and home loans and the terminology used in the financial industry and what factors are used to determine good and bad credit scores.
	IA.CT 5.3	List the various monthly expenses that will occur when owning or renting and obtain an apartment and determine the monthly expenses that they are responsible to pay.

Glenwood Community High School
Computer Science A Curriculum
Approved Date - February 2022

Course Purpose: The student will cultivate their understanding of coding through analyzing, writing, and testing code as they explore concepts like modularity, variables, and control structures. Fundamental topics in this course include the design and development of solutions that use control-structures, data structures, and object-oriented programming using Java programming language, the analysis of potential solutions, and the ethical and social implications of computing systems.

Course Outcome	Outcome Components	Description	PLTW Curriculum Codes	
CSA.1	**The student will use various coding concepts. (such as, creating classes that will focus on writing methods, built-in data types, expressions , and variables.)**		**CPU.CSE.1.1**	
	CSA.1.1	Create the first program by generating outputs and calling System class methods, while identifying and correcting errors in basic rules in coding structures.		CSA.1.1.1
	CSA.1.2	Analyze the use of variables in algorithms using different input values and determine the appropriate use for specific variables and data types.		CSA.1.1.2
	CSA.1.3	Develop the results of expressions using assignment statements, single line comments, and operators to construct compound expressions.		CSA.1.1.3
	CSA.1.4	Examine the compound assignment and increment/ decrement operators in a program while describing the behavior of a given segment of program code.		CSA.1.1.4
	CSA.1.5	Evaluate arithmetic expressions that use manual and automatic casting and explain why a code segment will not compile or work as intended.		CSA.1.1.5
CSA.2	**The student will create objects to introduce classes that represent logical information in a program. (e.g. use the String class to manage text-based data and the Math class to manage arithmetic data.)**		**CPU.CSA.1.2**	
	CSA.2.1	Explain the relationship between a class and an object.		CSA.1.2.1
	CSA.2.2	Identify and Explain different constructor signatures and create, explain relationships between a class and an object.		CSA.1.2.2
	CSA.2.3	Develop non-static void methods without parameters.		CSA.1.2.3
	CSA.2.4	Examine non-static void methods with parameters.		CSA.1.2.4
	CSA.2.5	Use a return value from a non-void method in a variable or as part of an expression		CSA.1.2.5
	CSA.2.6	Create and reference String objects.		CSA.1.2.6
	CSA.2.7	Compare and use String Objects and Methods		CSA.1.2.7
	CSA.2.8	Convert between primitive data types and objects		CSA.1.2.8
	CSA.2.9	Compute randomness into a program by using methods from the Math package.		CSA.1.2.9
CSA.3	**The student will apply Boolean expressions and If Statements to focus on conditional expressions to control flow of programs using the true or false state of variables.**		CPU.CSA.1.3	
	CSA.3.1	Modify Boolean expressions and use relational operators to compute the value of expressions.		CSA.1.3.1
	CSA.3.2	Connect control program flow with if statements then implement more complex control flow in more complex programs.		CSA.1.3.2
	CSA.3.3	Apply conditional statements (if/else if/else) to complete coding applications.		CSA.1.3.3
	CSA.3.4	Develop multiple selections with the if/else-if conditional		CSA.1.3.4
	CSA.3.5	Evaluate Boolean expressions using compound statements.		CSA.1.3.5
	CSA.3.6	Describe De Morgan's Laws and convert Boolean statements to conditional statements in code.		CSA.1.3.6
	CSA.3.7	Compare instances of classes to one another and create an equals method for a class.		CSA.1.3.7
CSA.4	**The student will create new and analyze existing algorithms that incorporate iteration/looping using "while" and "for" constraints.**		**CPU.CSA.2.4**	
	CSA.4.1	Develop a program that uses an iterative process to satisfy method specifications in		CSA.2.4.1

		expressions, conditional statements, and iterative statements.		
	CSA.4.2	Convert between “while” and “for” loops		CSA.2.4.2
	CSA.4.3	Formulate strings using loops.		CSA.2.4.3
	CSA.4.4	Determine code that would use the iterative process to complete code setments.		CSA.2.4.4
	CSA.4.5	Determine the number of times a code segment will execute.		CSA.2.4.5
CSA.5	**The student will write classes using methods and object-based algorithms to manage custom information in a program. Also, explore the ethical and social impacts of computing systems.**		**CPU.CSE.2.5**	
	CSA.5.1	Create a roadmap using non-programing methodology to design coding principles of a class.		CSA.2.5.1
	CSA.5.2	Examine class constructors that use pass by value and reference values in writing a program.		CSA.2.5.2
	CSA.5.3	Create precondition and postcondition commenting to summarize methods.		CSA.2.5.3
	CSA.5.4	Create and use methods (or functions) to solve problems		CSA.2.5.4
	CSA.5.5	Differentiate between the types of methods (or functions) used in classes.		CSA.2.5.5
	CSA.5.6	Evaluate object reference expressions that use keyword “this”.		CSA.2.5.6
	CSA.5.7	Define and create new types of objects.		CSA.2.5.7
	CSA.5.8	Define behaviors of a class through static methods and static variables.		CSA.2.5.8
	CSA.5.9	Decide where variables can be using a program.		CSA.2.5.9
CSA.6	**The student will develop and analyze array algorithms and the data that the array stores.**		**CPU.CSA.3.6**	
	CSA.6.1	Represent collections of related primitive or object reference data using arrays and manage relationships in data.		CSA.3.6.1
	CSA.6.2	Explain the elements in a 1D array, while identifying errors in various program examples.		CSA.3.6.2
	CSA.6.3	Identify, create, traverse, and manipulate elements in a 1D array.		CSA.3.6.3
	CSA.6.4	Modify and identify standard array transversal algorithms.		CSA.3.6.4
CSA.7	**The student will explore the functionality of ArrayLists while comparing the ArrayList with a collection of data in arrays.**		**CPU.CSA.3.7 & CPU.CSA.3.8**	
	CSA.7.1	Describe the use of the ArrayList class.		CSA.3.7.1
	CSA.7.2	Investigate the use of an import statement to make the ArrayList class available for use in a program.		CSA.3.7.2
	CSA.7.3	Determine the result or output based on the statement execution order in a code segment containing method calls.		CSA.3.7.3
	CSA.7.4	Identify, modify, and develop standard array transversal algorithms using ArrayLists.		CSA.3.7.4
	CSA.7.5	Explain how the result of program code changes given a change to the initial code.		CSA.3.7.5
	CSA.7.6	Apply and compute selection sort and insertion sort algorithms and compare the sorting algorithms.		CSA.3.7.6
	CSA.7.7	Investigate data using Application Programming Interface (API) to consider the implications of giving away personal information.		CSA.3.7.7
	CSA.7.8	Critique collections of related primitive or object reference data using two-dimensional array objects.		CSA.3.8.1
	CSA.7.9	Distinguish nested “for” loops to enhance using test cases to find the errors.		CSA.3.8.2
CSA.8	**The student will create and use objects based on the power of object hierarchies, sharing and reusing lower-level objects.**		**CPU.CSA.4.9**	
	CSA.8.1	Create an inheritance relationship from a subclass to superclass		CSA.4.9.1
	CSA.8.2	Create constructors for subclasses that represent inheritance relationships.		CSA.4.9.2
	CSA.8.3	Formulate overriding method in a subclass.		CSA.4.9.3
	CSA.8.4	Apply the keyword “super” to call a superclass's constructors and methods.		CSA.4.9.4
	CSA.8.5	Identify subclasses and superclasses and determine when polymorphism is being used.		CSA.4.9.5
	CSA.8.6	Use the compile-time and runtime impact of polymorphism to access the object class through inheritance.		CSA.4.9.6
	CSA.8.7	Illustrate the ultimate object class while using object class methods.		CSA.4.9.7

Glenwood Community High School
Computer Science Essentials (CSE) Curriculum
Approved Date - February 2022

Course Purpose: The student will experience the major topics, big ideas, and computational thinking practices used by computing professionals to solve problems and create value for others. This is the first course in the high school Computer Science pathway. It follows the PLTW Launch, Gateway, and App Creator courses that students take in middle school. This course will empower the student to develop computational thinking skills while building confidence that prepares them to advance to Computer Science Principles.

Course Outcome	Outcome Components	Description	PLTW Curriculum Codes	
CSE.1	**The student will apply the principles of block based programing within basic fundamental App development.**		**CPU.CSE.1.1**	
	CSE.1.1	Relate and describe essential programming concepts (abstraction, component, procedure, debugging) and apply those to the development of their App project.		CSE.1.1.1
	CSE.1.2	Develop and test app incrementally and independently using naming conventions and coding fundamentals.		CSE.1.1.2
	CSE.1.3	Apply conditionals in their block coding while using personalized modifiers to create a user interface.		CSE.1.1.3
	CSE.1.4	Write programs as pseudocode and natural coding language.		
	CSE.1.5	Determine when to use local and global variables.		CSE.1.1.4
	CSE.1.5	Analyze a programming algorithm, using “while” loops and incrementing a count.		CSE.1.1.5
CSE.2	**The student will apply the Agile development process to solve problems around specific computing tasks and app creation.**		**CPU.CSE.1.2**	
	CSE.2.1	Create code to problem solve through databases and lists.		CSE.1.2.1
	CSE.2.2	Identify ethical considerations related to applying algorithms to automate attempts to discover passwords.		CSE.1.2.2
	CSE.2.3	Create procedural abstractions and identify what details are hidden or abstracted in block-based programming.		CSE.1.2.3
	CSE.2.4	Identify variable roles (ie. best so far, accumulators, aggregators, fixed, etc.). and create an app that uses that variable role.		CSE.1.2.4
	CSE.2.5	Apply coding fundamentals and iterative processes while developing an app as part of a Scrum team.		CSE.1.2.5
CSE.3	**The student will compare text based coding while using block-based environment within the VEX interface.**		CPU.CSE.2.1	
	CSE.3.1	Compare and contrast lower-level programming languages with higher-level languages, while using basic rules related to programming with proper syntax.		CSE.2.1.1
	CSE.3.2	Apply coding fundamentals to translate block-based code in order to develop programs using proper syntax.		CSE.2.1.2
	CSE.3.3	Create block-based code by applying 2D arrays, while modifying and developing programs collaboratively using abstract concepts.		CSE.2.1.3
	CSE.3.4	Develop and decompose a program using VEX interface while applying coding fundamentals and iterative processes.		CSE.2.1.4
CSE.4	**The student will develop code to manipulate their self-driving vehicle to navigate through a specified route.**		**CPU.CSE.2.2**	
	CSE.4.1	Modify, identify, and differentiate between machine vision systems (i.e. the process of communicating with a camera via program code).		CSE.2.2.2
	CSE.4.2	Apply machine vision and conditionals on a collaborative program (i.e. robot automation).		CSE.2.2.3
	CSE.4.3	Develop a program that uses image processing to identify markers and other self-driving vehicles to avoid collisions while navigating a path.		CSE.2.2.4
	CSE.4.4	Develop a program that uses machine vision to allow a group of self-driving vehicles to navigate an arbitrary environment following a given set of constraints. (from		CSE.2.2.5(+)

		2.3.1)		
CSE.5	**The student will explore and apply the same essential coding fundamentals introduced earlier in block-based coding and apply them using Python language. (i.e. functions, variables, methods, …)**		**CPU.CSE.3.1**	
	CSE.5.1	Apply naming conventions and coding fundamentals while collaborating in cloud9 graphic user interface.		CSE.3.1.1
	CSE.5.2	Apply version control in developing a test code incrementally and independently.		CSE.3.1.2
	CSE.5.3	Create coding concepts using: variable names, data types, functions, nesting while building code.		CSE.3.1.3
CSE.6	**The student will manipulate lists, existing programs, and different functions within Python.**		**CPU.CSE.3.2**	
	CSE.6.1	Create, apply, and access lists using *Python.*		CSE.3.2.1
	CSE.6.2	Modify a program that posts messages and gets posts to understand how social media works.		CSE.3.2.2
	CSE.6.3	Modify a previously developed code to accept more than one order.		CSE.3.2.3
	CSE.6.4	Modify a course registration program to explore functions in *Python.*		CSE.3.2.4

Glenwood Community High School
Computer Science Principles (CSP) Curriculum
Approved Date - February 2022

Course Purpose: The students will explore computational thinking as they program using Python. They will gain an understanding of programming through hands-on activities, projects, and problems that are reflective of real-world challenges as they explore topics such as creativity, the Internet of Things, data science, and technology of the future. This course will empower the student to develop proactive thinking skills while building confidence that prepares them to advance to Computer Science A.

Course Outcome	Outcome Components	Description	PLTW Curriculum Codes	
CSP.1	**The student will apply and explore texted based coding fundamentals and create and manipulate texted based coding while finding solutions.**		**CPU.CSE.3.1**	
	CSP.2.1	Apply coding fundamentals, naming conventions, and version control.		CSE.3.1.1
	CSP.2.2	Develop and test Python code independently to create a basic program using an incremental process.		CSE.3.1.2
	CSP.2.3	Create guided Python code that instills data types, conditionals, and operators.		CSE.3.1.3
	CSP.2.4	Create, manipulate, and access lists in Python.		CSE.3.2.1
	CSP.2.5	Modify code using abstraction and looping to create a social media post.		CSE.3.2.2
	CSP.2.6	Decide when and how to use a “for loops” or a “while loops”.		CSE.3.2.3
	CSP.2.7	Examine functions and methods and determine if they need modification.		CSE.3.2.4
CSP.2	**The student will use the turtle graphics library in developing logical algorithms to provide desired outputs.**		**CPU.CSP.1.1**	
	CSP.1.1	Create algorithms that use sequencing.		CSP.1.1.1
	CSP.1.2	Analyze and explain the difference between class and object.		CSP.1.1.2
	CSP.1.3	Identify which code commands are object properties and methods.		CSP.1.1.3
	CSP.1.4	Use methods, while loops, and relational operators to create/check conditions in a program.		CSP.1.1.4
	CSP.1.5	Examine the effects of infinite loops and zero-iteration loops and their iterations.		CSP.1.1.5
	CSP.1.6	Demonstrate robot navigation with the use of an existing algorithm by using loops and nested loops.		CSP.1.1.6
	CSP.1.7	Examine a program with poorly written code by correcting errors using test cases, hand-tracing, visualizations, debuggers, and/or adding extra output statements.		CSP.1.1.7
	CSP.1.8	Use a “for” loop to iterate through elements in a list and also add/remove elements to and from that list.		CSP.1.1.8
	CSP.1.9	Create an algorithm with nested conditionals and nested iteration to stop a sprite and use if statements to create conditional execution.		CSP.1.1.9
CSP.3	**The student will use abstractions such as procedures, functions, lists, and data types to create complex programs.**		**CPU.CSP.1.2**	
	CSP.3.1	Use procedural abstraction, event-driven programming, and new methods to create procedures, randomness, and to move objects.		CSP.1.2.1
	CSP.3.2	Create and manipulate modules, strings, and lists, while using relational operators, logical operators, and other conditional needs.		CSP.1.2.2
	CSP.3.3	Create code that captures input from the keyboard using lists while using best practices in commenting code.		CSP.1.2.3
	CSP.3.4	Use sequencing, selection, and iteration to determine the purposes of algorithms that you are given and place them in the correct order for proper program execution.		CSP.1.2.4

CSP.4	**The student will incorporate various cybersecurity techniques to protect data.**		**CPU.CSP.2.1**	
	CSP.4.1	Discover and describe how data is stored, how phishing works, and how keylogger or other malware can be present on a computer.		CSP.2.1.1
	CSP.4.2	Create an encrypted message and obtain a certificate of authority to decrypt another team's message.		CSP.2.1.2
	CSP.4.3	Analyze and modify code that is designed to crack passwords to understand what strategies strengthen password protections through authorization and authentication measures.		CSP.2.1.3
	CSP.4.4	Create a user interface using appropriate libraries and procedures.		CSP.2.1.4
	CSP.4.5	Identify logic, syntax, and runtime errors, as well as optimizing Boolean expressions and selection statements interchangeably.		CSP.2.1.5
CSP.5	**The students will know how the Internet works through exchanging bits and packets. They will explore the hierarchical infrastructure and create their own interfaces to examine it.**		**CPU.CSP.2.2**	
	CSP.5.1	Analyze how the internet works through research.		CSP.2.2.1
	CSP.5.2	Explain how all data is represented using bits and how programs are used to translate data and binary computing.		CSP.2.2.2
	CSP.5.3	Examine and explain metadata, prompts, and compression in data transmission using packets and protocols.		CSP.2.2.3
	CSP.5.4	Compare and explore problem solutions that use sequential, parallel, and distributed computing.		CSP.2.2.4
	CSP.5.5	Create and input, process, output storage while identifying and describing how they pertain to privacy collecting and storing personal data on a computing system.		CSP.2.2.5
	CSP.5.6	Examine, enhance, and explore legal ways to use materials created by someone else, while enhancing a program and exploring the consequences of plagiarism and pirating.		CSP.2.2.6

App Creator (PLTW) Curriculum
Approved Date - October 2020

Course Purpose: App Creators introduces the student to the field of computer science and the concepts of computational thinking through the creation of mobile apps. The student will be challenged to be creative and innovative, as they collaboratively design anddevelop mobile solutions to engaging, authentic problems. The student will experience the positive impact of the application of computer science to society as well as other disciplines.

Course Outcomes	Outcome Components	Description	Iowa Core	National Standards
CT.AC7.1	**The student will create and execute applications by utilizing coding software and tools.**		TL-6	NIT-11
	CT.AC7.1.1	Use correct symbols and terminology for the specified coding tool when communicating with others about using the coding tools.		
	CT.AC7.1.2	Identify the proper steps in the app creation process and classify activities into their proper steps. 1. Identify the problem the app will address. 2. Design (sketch) a user interface to gather input and present output 3. Create the user interface in the coding tool. 4. Determine the algorithm (or steps) needed to process the input into the output. 5. Code the steps using the coding tool. 6. Test the app for usability and accuracy. Debug if required. 7. Deploy the app to end users.		
	CT.AC7.1.3	Create, debug, and execute apps by correctly using coding tools.		
CT.AC7.2	**The student will create apps that use variables and constants to receive and use information while the app is executing.**			
	CT.AC7.2.1	Declare and initialize variables and constants properly in the app code.		
	CT.AC7.2.2	Differentiate between variables and constants and use the correct type in different coding situations.		
	CT.AC7.2.3	Create, debug, and execute apps that store data values in variables and constants.		
	CT.AC7.2.4	Create, debug, and execute apps that retrieve data values that were previously stored in variables and constants.		
CT.AC7.3	**The student will create apps that contain conditional logic.**		TL-4, TL-6	NIT-11
	CT.AC.7.3.1	Use correct symbols and terminology when creating and discussing conditional logic in coding.		
	CT.AC.7.3.2	Contrast the different forms of decision structures and justify the use of each type in different situations.		
	CT.AC.7.3.3	Create, debug, and execute apps that contain conditional logic.		
CT.AC7.4	**The student will create apps that contain looping structures.**		TL-4, TL-6	NIT-11
	CT.AC7.4.1	Use correct symbols and terminology when creating and discussing looping structures in coding.		
	CT.AC7.4.2	Contrast the different forms of looping structures and justify the use of each type in different situations.		
	CT.AC7.4.3	Create, debug, and execute apps that contain looping structures.		
CT.AC7.5	**The student will apply all the knowledge and skills they have acquired to design and create a mobile app solution for a personal or community problem.**		TL-4, TL-6	NIT-11

	CT.AC7.5.1	Apply the design process and computational thinking skills to decompose the problem into smaller modules.		
	CT.AC7.5.2	Design and create an appropriate user interface for an original mobile app.		
	CT.AC7.5.3	Create, debug, and execute An original app that contains multiple coding structures that interact together and store data using variables and constants.		