

## CENTER FOR ADVANCED TECHNICAL STUDIES

- For all dual credit courses, dual credit requirements must be met at the time the course is taken.
- For second-year courses in which the demand exceeds the available seats, placement in the second-year course will be determined based on rank order of the final grade in the first-year course.
- Eligibility for all second year-courses requires a certification in the first -year course.

## AGRICULTURE, FOOD, & NATURAL RESOURCES CAREER CLUSTER

### AGRICULTURAL & BIOSYSTEMS SCIENCE

**569100CW**

**Grade: 9, 10, 11**

**Semesters: 1      Credit: 1**

**Prerequisite: Algebra 1 or Foundations in Algebra**

Agricultural and Biosystems Science teaches essential concepts related to skills needed to pursue a career in a biotechnology field. Emphasis is placed on scientific research and development (R&D) and how it can be used to create future advancements in agriculture. Students will learn the basic principles of plant and animal science as well as the role of agriculture in our society and the importance of agriculture to the welfare of the world. Basic personal and community leadership and safety practices are included, and each student designs and participates in a supervised agricultural experience. Typical hands-on learning experiences include performing research on the basic principles of plant, soil, and animal science; studying and modeling the significance of humankind's interrelationship with soil, water, and air; and participating in Future Farmers of America (FFA) activities

### AGRICULTURAL & BIOSYSTEMS SCIENCE, HONORS

**569100HW**

**Grade: 9, 10, 11**

**Semesters: 1      Credit: 1**

**Prerequisite: Algebra 1 or Foundations in Algebra**

The Agricultural and Biosystems Science course is designed to teach essential concepts and understanding related to skills needed in pursuing a career in a biotechnology field. Emphasis is placed on scientific research and development and how it can be used to create the future advancements in Agriculture. In addition, the course will teach the basic principles of plant and animal science as well as the role of agriculture in our society and the importance of agriculture to the welfare of the world. Basic personal and community leadership and safety practices are included as a part of the instructional program. Each student is expected to design and participate in a supervised agricultural experience. Typical learning activities include hands-on learning experiences, including performing research on the basic principles of plant, soil, and animal science; studying and modeling the significance of humankind's interrelationship with soil, water, and air; and participating in FFA activities. This curriculum, methods, and assessments indicate an increased depth of rigor, complexity, challenges, and creativity beyond the CP level course. This course is designed to accelerate, extend, and deepen the learning opportunities for students exhibiting superior ability. The curriculum places emphasis on critical and analytical thinking, rational decision making, and inductive and deductive reasoning. Students must be prepared to work outside in various weather and climate conditions.

### ANIMAL SCIENCE

**560300CW**

**Grade: 10, 11, 12**

**Semesters: 1      Credit: 1**

**Prerequisite: Successful completion of Agricultural & Biosystems Science**

Animal Science provides an overview of the animal science industry, including information on the biological makeup of various species of agricultural livestock. It also provides students with beneficial information on animal behavior before they decide to embark on a career in Animal Science. Animal Science is recommended as a prerequisite for other courses in Animal Science. Typical instructional activities include hands-on experiences with the principles and practices essential in the production and management of farm animals and farm animal products for economic, recreational, and therapeutic uses; participating in personal and community leadership development activities; planning and implementing a relevant work-based learning transition experience; and participating in Future Farmers of America (FFA) activities.

### ANIMAL SCIENCE, HONORS

**560300HW**

**Grade: 10, 11, 12**

**Semesters: 1      Credit: 1**

**Prerequisite: Successful completion of Agricultural & Biosystems Science, Honors**

The Animal Science course is designed to provide an overview of the animal science industry. It provides information on the biological makeup of various species of agricultural livestock. It also provides students with information on animal behavior that would be beneficial before embarking on a career in Animal Science. Typical instructional activities include hands-on experiences with the principles and practices essential in the production and management of farm animals and farm animal products for economic, recreational, and therapeutic uses; participating in personal and community leadership development activities; and planning and implementing a relevant school-to-work transition experience. Students must be prepared to work outside in various

weather and climate conditions. Emphasis will be placed on analysis and evaluation of current topics related to food production and its impact on society. This curriculum, methods, and assessments indicate an increased depth of rigor, complexity, challenges, and creativity beyond the CP level course. This course is designed to accelerate, extend, and deepen the learning opportunities for students exhibiting superior ability. The curriculum places emphasis on critical and analytical thinking, rational decision making, and inductive and deductive reasoning.

### **BIOSYSTEMS MECHANICS & ENGINEERING**

**Grade: 10, 11**

**569200CW**

**Semesters: 1      Credit: 1**

**Prerequisite:** Successful completion of Agricultural & Biosystems Science

The Biosystems Mechanics and Engineering course is designed to teach basic physical science skills in relation to Agricultural Engineering. In addition, it provides for the development of general mechanical skills that are required in all areas of Agricultural Education. Typical instructional activities include hands-on experiences in developing research projects to examine ways to utilize agricultural crops in unique ways, to include the development of biofuels and other alternative energy sources and to discover new uses for agricultural products. In addition, students will participate in personal and community leadership development activities, plan and implement a relevant work-based learning transition experience and participate in Future Farmers of America (FFA) activities.

### **BIOSYSTEMS MECHANICS & ENGINEERING, HONORS**

**Grade: 10, 11**

**569200HW**

**Semesters: 1      Credit: 1**

**Prerequisite:** Successful completion of Agricultural & Biosystems Science, Honors

The Biosystems Mechanics and Engineering course is designed to teach basic physical science skills in relation to Agricultural Engineering. In addition, it provides for the development of general mechanical skills that are required in all areas of Agricultural Education. Typical instructional activities include hands-on experiences in developing research projects to examine ways to utilize agricultural crops in unique ways, to include the development of biofuels and other alternative energy sources and to discover new uses for agricultural products. In addition, students will participate in personal and community leadership development activities, as well as plan and implement a relevant school-to-work transition experience. Students must be prepared to work outside in various weather and climate conditions. Students are required to conduct research and address current issues in Agricultural Education. This curriculum, methods, and assessments indicate an increased depth of rigor, complexity, challenges, and creativity beyond the CP level course. This course is designed to accelerate, extend, and deepen the learning opportunities for students exhibiting superior ability. The curriculum places emphasis on critical and analytical thinking, rational decision making, and inductive and deductive reasoning.

### **BIOSYSTEM TECHNOLOGY 3**

**Grade: 10, 11, 12**

**569500CW**

**Semester: 1      Credit: 1**

**Prerequisite:** Agricultural and Biosystems Science and Biosystems Mechanics and Engineering

Biosystems Technology 3 course expands upon information and material introduced in the Agricultural and Biosystems Science and Biosystems Mechanics and Engineering courses. Content focuses on biological and engineering sciences important to the bioprocessing and biofuels industry, including microbial concepts, reactor design, and laboratory techniques inherent. Emphasis is placed on the role of agriculture in our society and the importance of agriculture to the welfare of the world. Basic personal and community leadership and laboratory safety are included. Each student is required to design and participate in a supervised agricultural experience. Typical hands-on learning experiences include performing basic principles of plant, soil, and animal science; studying and modeling the significance of humankind's interrelationship with soil, water, and air; and participating in Future Farmers of America (FFA) activities.

### **BIOSYSTEM TECHNOLOGY 4**

**Grade: 10, 11, 12**

**569600CW**

**Semester: 1      Credit: 1**

**Update Prerequisite to:** Agricultural and Biosystems Science, Biosystems Mechanics and Engineering and Biosystems Technology 3

The Biosystems Technology 4 course introduces the major unit operations and technology used in bioprocessing, including heat exchangers, bioreactors, pumps, and cell/product separation systems. The content directly expands upon information and material introduced in the Agricultural and Biosystems Science and Biosystems Mechanics and Engineering courses. Emphasis is placed on the role of agriculture in our society and the importance of agriculture to the welfare of the world. Basic personal and community leadership and laboratory safety are included. Each student is required to design and participate in a supervised agricultural experience. Typical hands-on learning experiences include performing basic principles of plant, soil, and animal science; studying and modeling the significance of humankind's interrelationship with soil, water, and air; and participating in Future Farmers of America (FFA) activities.

**ENVIRONMENTAL AND NATURAL RESOURCES MANAGEMENT****562600CW****Grade: 10, 11, 12****Semester: 1 Credits 1****Prerequisite: Agriculture and Biosystems Science and Biosystems Mechanics & Engineering**

Environmental and Natural Resource Management is the introductory course for the Environmental and Natural Resources Career Pathway. It is a combination of subject matter and planned learning experiences on the principles involved in the conservation and/or improvement of natural resources such as air, soil, water, land, forest, and wildlife for economic and recreational purposes. Instruction also emphasizes such factors as the establishment, management, and operation of land for recreational purposes. Typical learning activities include constructing a model watershed; identifying and/or measuring the levels of air, water, noise, and solid waste pollution in a selected site; participating in hands-on experiences with site analysis; evaluating competing interests; and analyzing biological and physical aspects of the environment and environment-related issues including methods of abating and controlling pollution. Students participate in personal and community leadership development activities, plan and implement a relevant work-based learning transition experience, and participate in Future Farmers of America (FFA) activities. Students must be prepared to work outside in various weather and climate conditions.

**ENVIRONMENTAL AND NATURAL RESOURCES MANAGEMENT HONORS****562600HW****Grade: 10, 11, 12****Semester: 1 Credits 1****Prerequisite: Agriculture and Biosystems Science and Biosystems Mechanics & Engineering**

Environmental and Natural Resource Management is the introductory course for the Environmental and Natural Resources Career Pathway. It is a combination of subject matter and planned learning experiences on the principles involved in the conservation and/or improvement of natural resources such as air, soil, water, land, forest, and wildlife for economic and recreational purposes. Instruction also emphasizes such factors as the establishment, management, and operation of land for recreational purposes. Typical learning activities include constructing a model watershed; identifying and/or measuring the levels of air, water, noise, and solid waste pollution in a selected site; participating in hands-on experiences with site analysis; evaluating competing interests; and analyzing biological and physical aspects of the environment and environment-related issues including methods of abating and controlling pollution. Students participate in personal and community leadership development activities, plan and implement a relevant work-based learning transition experience and participate in Future Farmers of America (FFA) activities.

**INTRODUCTION TO VETERINARY SCIENCE****561300CW****Grade: 11-12****Semesters: 1 Credit: 1****Prerequisite: Successful completion of Small Animal Care**

In this advanced animal science course, students will explore the field of veterinary medicine. Students will study the role of a veterinarian and veterinary technician in the diagnosis and treatment of animal diseases. Topics to be discussed include: veterinary terminology, anatomy and physiology, pathology, genetics, handling and restraint, and physical examinations along with common surgical skills. Students will engage in a variety of laboratory activities and will participate in shadowing and/or other work-based learning experiences.

**INTRODUCTION TO VETERINARY SCIENCE, HONORS****561300HW****Grade: 11- 12****Semesters: 1 Credit: 1****Prerequisite: Successful completion of Small Animal Care**

In this advanced animal science course, students will explore the field of veterinary medicine. Students will study the role of a veterinarian and veterinary technician in the diagnosis and treatment of animal diseases. Topics to be discussed include: veterinary terminology, anatomy and physiology, pathology, genetics, handling and restraint, and physical examinations along with common surgical skills. Students will engage in a variety of laboratory activities and will participate in shadowing and/or other school-to-work experiences. Honors students will be required to conduct independent research on a selected small and large animal disease, write an extensive research document and present findings in a public venue. Students must be prepared to work outside in various weather and climate conditions. This curriculum, methods, and assessments indicate an increased depth of rigor, complexity, challenges, and creativity beyond the CP level course. This course is designed to accelerate, extend, and deepen the learning opportunities for students exhibiting superior ability. The curriculum places emphasis on critical and analytical thinking, rational decision making, and inductive and deductive reasoning.

**SMALL ANIMAL CARE****561200CW****Grade: 10, 11, 12****Semesters: 1 Credit: 1****Prerequisite: Successful completion of Animal Science**

The Small Animal Care course is designed to teach technical knowledge and skills for occupations in the pet industry or the companion animal industry. Skills also relate to the veterinarian or the veterinarian technician career field.

**SMALL ANIMAL CARE, HONORS****561200HW**

**Grade: 10, 11, 12**

**Semesters: 1      Credit: 1**

**Prerequisite: Successful completion of Animal Science**

The Small Animal Care course is designed to teach technical knowledge and skills for occupations in the pet industry or the companion animal industry. Skills also relate to the veterinarian or the veterinarian technician career field. Typical instructional activities include hands-on experiences with cats, dogs, rabbits, fish, etc. participating in personal and community leadership development activities; and planning a relevant school to work transition experience. This curriculum, methods, and assessments indicate an increased depth of rigor, complexity, challenges, and creativity beyond the CP level course. This course is designed to accelerate, extend, and deepen the learning opportunities for students exhibiting superior ability. The curriculum places emphasis on critical and analytical thinking, rational decision making, and inductive and deductive reasoning. Students must be prepared to work outside in various weather and climate conditions.

#### **WILDLIFE MANAGEMENT**

**567400CW**

**Grade: 10, 11, 12**

**Semesters: 1      Credit: 1**

**Prerequisite: Successful completion of Environmental and Natural Resources Management**

The Wildlife Management course is designed to be an introductory course for the Environmental and Natural Resources pathway. The course is a combination of subject matter and planned learning experiences on the principles involved in the conservation and/or improvement of natural resources such as air, soil, water, land, forest, and wildlife for economic and recreational purposes. Instruction also emphasizes such factors as the establishment, management, and operation of land for recreational purposes.

#### **WILDLIFE MANAGEMENT, HONORS**

**567400HW**

**Grade: 10, 11, 12**

**Semesters: 1      Credit: 1**

**Prerequisite: Successful completion of Environmental and Natural Resources Management**

The Wildlife Management course is designed to teach technical knowledge and skills for entry-level positions in the conservation and/or management of wildlife enterprises. Typical instructional activities include hands-on experiences with analyzing problems and developing site plans including the essential elements, concepts, and skills related to wildlife management; understanding basic ecological concepts; implementing habitat management practices; identifying wildlife and fish species; analyzing policies, laws and regulations, and using natural resources for outdoor recreation; participation in personal and community leadership development activities and planning and implementing a relevant supervised agricultural experience. This curriculum, methods, and assessments indicate an increased depth of rigor, complexity, challenges, and creativity beyond the CP level course. This course is designed to accelerate, extend, and deepen the learning opportunities for students exhibiting superior ability. The curriculum places emphasis on critical and analytical thinking, rational decision making, and inductive and deductive reasoning. Students must be prepared to work outside in various weather and climate conditions.

### **ARCHITECTURE & CONSTRUCTION CAREER CLUSTER**

#### **INTRODUCTION TO CONSTRUCTION**

**600100CW**

**Grade Level 9**

**Semesters:1      Credits 1**

**Prerequisite None**

Construction technology provides students with an understanding of how construction impacts their lives, both socially and professionally. Students will explore and demonstrate an understanding of five elements of construction: Career Opportunities, Design, Measurements, Tools, and Materials.

#### **BUILDING CONSTRUCTION 1**

**6060CTCW**

**Grade: 10, 11**

**Semesters: 1      Credit: 1**

**Prerequisite: Algebra 1**

The Construction Technology program offers students practical training in the entire range of residential and light commercial building techniques including estimating building costs, carpentry, cabinetmaking, residential wiring, blueprint reading, brick masonry, construction, building codes, and safety. Classroom knowledge is enhanced through multiple hands-on projects. Successful completion of program curriculum will provide students with the opportunity to become eligible for industry-recognized credentials and certifications. One computer per student with internet access should be available.

#### **BUILDING CONSTRUCTION 2**

**6061CTCW**

**Grade: 10, 11**

**Semesters: 1      Credit: 1**

**Prerequisite: Successful completion of Building Construction 1**

The Construction Technology program offers students practical training in the entire range of residential and light commercial building techniques including estimating building costs, carpentry, cabinetmaking, residential wiring, blueprint reading, brick masonry, construction, building codes, and safety. Classroom knowledge is enhanced through multiple hands-on projects. Successful

completion of program curriculum will provide students with the opportunity to become eligible for industry-recognized credentials and certifications. One computer per student with internet access should be available.

### **BUILDING CONSTRUCTION 3**

**Grade: 11, 12**

**6062CTCW**

**Semesters: 1      Credit: 1**

**Prerequisite: Successful completion of Building Construction 2**

The Construction Technology program offers students practical training in the entire range of residential and light commercial building techniques including estimating building costs, carpentry, cabinetmaking, residential wiring, blueprint reading, brick masonry, construction, building codes, and safety. Classroom knowledge is enhanced through multiple hands-on projects. Successful completion of program curriculum will provide students with the opportunity to become eligible for industry-recognized credentials and certifications. One computer per student with internet access should be available.

### **BUILDING CONSTRUCTION 4**

**Grade: 11, 12**

**6063CTCW**

**Semesters: 1      Credit: 1**

**Prerequisite: Successful completion of Building Construction 3**

The Construction Technology program offers students practical training in the entire range of residential and light commercial building techniques including estimating building costs, carpentry, cabinetmaking, residential wiring, blueprint reading, brick masonry, construction, building codes, and safety. Classroom knowledge is enhanced through multiple hands-on projects. Successful completion of program curriculum will provide students with the opportunity to become eligible for industry-recognized credentials and certifications. One computer per student with internet access should be available.

### **ELECTRICITY 1**

**Grade: 10, 11**

**6287CTCW**

**Semesters: 1      Credit: 1**

**Prerequisite: Algebra 1 or Foundations in Algebra**

Electricity comprehensive courses provide a survey of the theory, terminology, equipment, and practical experience in the skills needed for careers in the electrical field. These courses typically include AC and DC circuitry, safety, and the National Electrical Code and may cover such skills as those involved in building circuits; wiring residential, commercial, and/or industrial buildings; installing lighting, power circuits, and cables; and estimating job costs. As students progress, their projects become more complex and expansive. In these courses, safety is stressed, and a career exploration component may be offered.

### **ELECTRICITY 2**

**Grade: 10, 11**

**6288CTCW**

**Semesters: 1      Credit: 1**

**Prerequisite: Successful completion of Electricity 1**

Electricity comprehensive courses provide a survey of the theory, terminology, equipment, and practical experience in the skills needed for careers in the electrical field. These courses typically include AC and DC circuitry, safety, and the National Electrical Code and may cover such skills as those involved in building circuits; wiring residential, commercial, and/or industrial buildings; installing lighting, power circuits, and cables; and estimating job costs. As students progress, their projects become more complex and expansive. In these courses, safety is stressed, and a career exploration component may be offered.

### **ELECTRICITY 3**

**Grade: 11, 12**

**6289CTCW**

**Semesters: 1      Credit: 1**

**Prerequisite: Successful completion of Electricity 2**

Electricity comprehensive courses provide a survey of the theory, terminology, equipment, and practical experience in the skills needed for careers in the electrical field. These courses typically include AC and DC circuitry, safety, and the National Electrical Code and may cover such skills as those involved in building circuits; wiring residential, commercial, and/or industrial buildings; installing lighting, power circuits, and cables; and estimating job costs. As students progress, their projects become more complex and expansive. In these courses, safety is stressed, and a career exploration component may be offered.

### **ELECTRICITY 4**

**Grade: 11, 12**

**6290CTCW**

**Semesters: 1      Credit: 1**

**Prerequisite: Successful completion of Electricity 3**

Electricity comprehensive courses provide a survey of the theory, terminology, equipment, and practical experience in the skills needed for careers in the electrical field. These courses typically include AC and DC circuitry, safety, and the National Electrical Code and may cover such skills as those involved in building circuits; wiring residential, commercial, and/or industrial buildings; installing lighting, power circuits, and cables; and estimating job costs. As students progress, their projects become more complex and expansive. In these courses, safety is stressed, and a career exploration component may be offered.

## ARTS, A/V TECHNOLOGY, & COMMUNICATION CAREER CLUSTER

### DIGITAL ART AND DESIGN 1

Grade: 10, 11

6120CTCW

Semesters: 1      Credit: 1

**Prerequisite:** Algebra 1 or Foundations in Algebra

The ever changing and global technological advancements offer newer and broader opportunities in the creative industry. The Digital Art and Design program prepares students for a multitude of careers in the graphic design field. This program provides instruction in layout, computer design, electronic art, color enhancement, and digital photography. Students use design concepts, principles, and processes that meet client expectations using Adobe Creative Suite Software: Photoshop, Illustrator, and InDesign. Students will have the opportunity to attain Adobe Certified Associate certification. Career development and employability skills are the foundation of all career and technical education. Students will compile their works for inclusion in a portfolio, for use in this program of study, the workforce, or postsecondary education.

### DIGITAL ART AND DESIGN 2

Grade: 10, 11

6121CTCW

Semesters: 1      Credit: 1

**Prerequisite:** Successful completion of Digital Art and Design 1

The ever changing and global technological advancements offer newer and broader opportunities in the creative industry. The Digital Art and Design program prepares students for a multitude of careers in the graphic design field. This program provides instruction in layout, computer design, electronic art, color enhancement, and digital photography. Students use design concepts, principles, and processes that meet client expectations using Adobe Creative Suite Software: Photoshop, Illustrator, and InDesign. Students will have the opportunity to attain Adobe Certified Associate certification. Career development and employability skills are the foundation of all career and technical education. Students will compile their works for inclusion in a portfolio, for use in this program of study, the workforce, or postsecondary education.

### DIGITAL ART AND DESIGN 3

Grade: 11, 12

6122CTCW

Semesters: 1      Credit: 1

**Prerequisite:** Successful completion of Digital Art and Design 2

The ever changing and global technological advancements offer newer and broader opportunities in the creative industry. The Digital Art and Design program prepares students for a multitude of careers in the graphic design field. This program provides instruction in layout, computer design, electronic art, color enhancement, and digital photography. Students use design concepts, principles, and processes that meet client expectations using Adobe Creative Suite Software: Photoshop, Illustrator, and InDesign. Students will have the opportunity to attain Adobe Certified Associate certification. Career development and employability skills are the foundation of all career and technical education. Students will compile their works for inclusion in a portfolio, for use in this program of study, the workforce, or postsecondary education.

### DIGITAL ART AND DESIGN 4

Grade: 11, 12

6123CTCW

Semesters: 1      Credit: 1

**Prerequisite:** Successful completion of Digital Art and Design 3

The ever changing and global technological advancements offer newer and broader opportunities in the creative industry. The Digital Art and Design program prepares students for a multitude of careers in the graphic design field. This program provides instruction in layout, computer design, electronic art, color enhancement, and digital photography. Students use design concepts, principles, and processes that meet client expectations using Adobe Creative Suite Software: Photoshop, Illustrator, and InDesign. Students will have the opportunity to attain Adobe Certified Associate certification. Career development and employability skills are the foundation of all career and technical education. Students will compile their works for inclusion in a portfolio, for use in this program of study, the workforce, or postsecondary education.

### MEDIA TECHNOLOGY 1

Grade: 10, 11

6124CTCW

Semesters: 1      Credit: 1

**Prerequisite:** Algebra 1 or Foundations in Algebra, English 1

Media Technology 1 explores the general field of communications focused primarily on media production industries. Students will get hands-on experience in basic production techniques for audio and video. They will work collaboratively writing, producing, directing, and editing projects using industry-standard software and equipment. Safety is emphasized in this course and students will have the opportunity to acquire an industry-recognized safety certification. Students will also learn about related fields such as graphic design, broadcast journalism, animation, sound design and engineering, special effects, online media development, marketing, and corporate communications.

### MEDIA TECHNOLOGY 1, HONORS

Grade: 10, 11

6124CTHW

Semesters: 1      Credit: 1

**Prerequisite: Algebra 1 or Foundations in Algebra, English 1**

Media Technology 1 introduces students to the theory and practice of various forms of media production. Students enrolled in this course will gain an understanding of how media informs communication through audiovisual (AV) production. Through hands-on experiences and projects, students will learn basic electronic field production techniques by using professional video and audio equipment, as well as non-linear editing systems. Students may create basic projects by writing, producing, directing, shooting, recording, and editing their own creative work. This curriculum, methods, and assessments indicate an increased depth of rigor, complexity, challenges, and creativity beyond the CP level course. This course is designed to accelerate, extend, and deepen the learning opportunities for students exhibiting superior ability. The curriculum places emphasis on critical and analytical thinking, rational decision making, and inductive and deductive reasoning.

**MEDIA TECHNOLOGY 2****Grade: 10, 11****6125CTCW****Semesters: 1      Credit: 1****Prerequisite: Successful completion of Media Technology 1**

Media Technology 2 students continue to explore the general field of communications focused primarily on media production industries. Students will get hands-on experience in production techniques for audio and video. They will work collaboratively writing, producing, directing, and editing projects using industry standard software and equipment. Safety is emphasized in this course and students will have the opportunity to acquire an industry-recognized safety certification. Students will also learn about related fields such as graphic design, broadcast journalism, animation, sound design and engineering, special effects, online media development, marketing, and corporate communications.

**MEDIA TECHNOLOGY 2, HONORS****Grade: 10, 11****6125CTHW****Semesters: 1      Credit: 1****Prerequisite: Successful completion of Media Technology 1, Honors**

Media Technology 2 affords students the opportunity to build on their basic audiovisual (AV) production skill set by adding studio production to their field production abilities. Students will learn about multi-camera production, live to tape switching, technical directing, advanced lighting and advanced post-production techniques. Students may continue to produce their own projects and formalize their production roles as they further explore the careers, industries, and technology associated with mass communications and media production. Students may formalize their career explorations through in-depth research presentations. When possible, students may take field trips and have in-program guest speakers from the media industry. This curriculum, methods, and assessments indicate an increased depth of rigor, complexity, challenges, and creativity beyond the CP level course. This course is designed to accelerate, extend, and deepen the learning opportunities for students exhibiting superior ability. The curriculum places emphasis on critical and analytical thinking, rational decision making, and inductive and deductive reasoning.

**MEDIA TECHNOLOGY 3****Grade: 11, 12****6126CTCW****Semesters: 1      Credit: 1****Prerequisite: Successful completion of Media Technology 2**

Media Technology 3 is the third course in the Media Technology program. In this course, students continue their in-depth exploration of the general field of communications focused primarily on media production industries. Students will get hands-on experience in production techniques for audio and video. They will work collaboratively writing, producing, directing, and editing increasingly complex projects using industry-standard software and equipment. A professional media production skill set is emphasized in this course and students are expected to consistently apply these skills to their projects. They will create and refine the necessary professional materials necessary for entry level employment in the media industries. Lastly, students will have the opportunity to acquire industry-recognized certifications.

**MEDIA TECHNOLOGY 3, HONORS****Grade: 11, 12****6126CTHW****Semesters: 1      Credit: 1****Prerequisite: Successful completion of Media Technology 2, Honors**

Media Technology 3 is a selective course that builds on a student's established media technology skill set. Students enrolled in this course will create projects of increasing complexity for various audiences. They may work on client-centered projects that highlight real-world, professional industry structures as well as organize productions for multiple distribution outlets. They may create short and long form news packages and public affairs pieces while understanding the impact of media bias and how governing legal requirements shape all media production. Students will begin production on their Media Technology Portfolio and their required Capstone Project (an advanced component of the overall portfolio). Students enrolled in the course may have the opportunity to connect with industry professionals through constructive critiques of their work, possible job shadowing opportunities, and in-program speakers. This course will also prepare students for the next chapter of their career exploration by examining advanced opportunities for learning through two and four-year degree programs, internships and apprenticeships, as well as direct to work pathways. Upon discovering various education and career pathways related to media production, students may research and present

an advanced project associated with said pathways. This curriculum, methods, and assessments indicate an increased depth of rigor, complexity, challenges, and creativity beyond the CP level course. This course is designed to accelerate, extend, and deepen the learning opportunities for students exhibiting superior ability. The curriculum places emphasis on critical and analytical thinking, rational decision making, and inductive and deductive reasoning.

#### **MEDIA TECHNOLOGY 4**

**Grade: 11, 12**

**6127CTCW**

**Semesters: 1      Credit: 1**

##### **Prerequisite: Successful completion of Media Technology 3**

Media Technology 4 is the final course in the Media Technology program. In this course, students are expected to demonstrate mastery of media production skill sets and consistently apply these skills to their projects. They will work both independently and collaboratively to produce advanced level projects using industry-standard software and equipment as well as emerging technologies. This course will incorporate work-based learning opportunities, when appropriate and where available. Students are expected to finalize professional materials necessary for entry-level employment in the media industries including attainment of industry-recognized certifications.

#### **MEDIA TECHNOLOGY 4, HONORS**

**Grade: 11, 12**

**6127CTHW**

**Semesters: 1      Credit: 1**

##### **Prerequisite: Successful completion of Media Technology 3, Honors**

The Media Technology 4 course at the Center for Advanced Technical Studies is a student's capstone experience. Students enrolled in this course will continue their work on their Media Technology Portfolio and their required Capstone Project while shifting their focus to digital filmmaking and television production. In this course, students may create an experimental audiovisual piece for exhibition and defense as well as a short digital film (narrative, documentary, or animation) for public exhibition. Students will work individually and in groups while writing, producing, directing, and editing their projects. They can further connect with industry professionals through the exhibition of their work. Students may also have the opportunity to earn industry certifications in media production and post-production by sitting for credential examinations. This curriculum, methods, and assessments indicate an increased depth of rigor, complexity, challenges, and creativity beyond the CP level course. This course is designed to accelerate, extend, and deepen the learning opportunities for students exhibiting superior ability. The curriculum places emphasis on critical and analytical thinking, rational decision making, and inductive and deductive reasoning.

### **HEALTH SCIENCE CAREER CLUSTER**

#### **PRINCIPLES OF BIOMEDICAL SCIENCE (PLTW)**

**Grade: 9, 10, 11**

**5580CTCW**

**Semesters: 1      Credit: 1**

##### **Prerequisite: Biology 1 or concurrent enrollment, and Algebra 1, and English 1**

Principles of Biomedical Sciences is a foundation course for the Project Lead the Way (PLTW) Biomedical Sciences program for high school students. This course introduces biomedical sciences through exciting hands-on projects and problems. Students investigate the human body systems and various health conditions. The activities and projects introduce students to human physiology, medicine, research processes and bioinformatics. Key biological concepts including homeostasis, metabolism, inheritance of traits, and defense against disease are embedded in the curriculum. This class provides the opportunity for dual weighting upon successful completion.

#### **PRINCIPLES OF BIOMEDICAL SCIENCE, HONORS (PLTW)**

**Grade: 9, 10, 11**

**5580CTHW**

**Semesters: 1      Credit: 1**

##### **Prerequisite: Biology 1 or concurrent enrollment, and Algebra 1, and English 1**

Principles of Biomedical Sciences is a foundation course for the Project Lead the Way (PLTW) Biomedical Sciences program for high school students. This course introduces the biomedical sciences through exciting hands-on projects and problems. Students investigate the human body systems and various health conditions including heart disease, diabetes, sickle cell disease, hypercholesterolemia, and infectious diseases. They determine the factors that led to the death of a fictional person, and investigate lifestyle choices and medical treatments that might have prolonged the person's life. The activities and projects introduce students to human physiology, medicine, research processes and bioinformatics. Key biological concepts including homeostasis, metabolism, inheritance of traits, and defense against disease are embedded in the curriculum. Engineering principles including the design process, feedback loops, and the relationship of structure to function are also incorporated. This class provides the opportunity for dual weighting upon successful completion.

#### **HUMAN BODY SYSTEMS (PLTW)**

**Grade: 9, 10, 11**

**5581CTCW**

**Semesters: 1      Credit: 1**

##### **Prerequisite: Successful completion of Principles of Biomedical Science**

Human Body Systems is a foundation course for the Project Lead the Way (PLTW) Biomedical Sciences programs for high school students. Students examine the interactions of body systems as they explore identity, communication, power, movement, protections, and homeostasis. Students design experiments, investigate the structures and functions of the human body, and use data acquisition software to monitor body functions such as muscle movement, reflex and voluntary action, and respiration. Exploring science in action, students build organs and tissues on a skeletal manikin, work through interesting real-world cases and often play the role of biomedical professionals to solve medical mysteries. This class provides the opportunity for dual weighting upon successful completion.

**HUMAN BODY SYSTEMS, HONORS (PLTW)**

**Grade: 9, 10, 11**

**5581CTHW**

**Semesters: 1      Credit: 1**

**Prerequisite: Successful completion of Principles of Biomedical Science, Honors**

Human Body Systems is a foundation course for the Project Lead the Way (PLTW) Biomedical Sciences programs for high school students. Students examine the interactions of body systems as they explore identity, communication, power, movement, protections, and homeostasis. Students design experiments, investigate the structures and functions of the human body, and use data acquisition software to monitor body functions such as muscle movement, reflex and voluntary action, and respiration. Exploring science in action, students build organs and tissues on a skeletal manikin, work through interesting real-world cases and often play the role of biomedical professionals to solve medical mysteries. This class provides the opportunity for dual weighting upon successful completion.

**MEDICAL INTERVENTIONS (PLTW)**

**Grade: 10, 11, 12**

**5582CTCW**

**Semesters: 2      Credit: 1**

**Prerequisite: Successful completion of Principles of Biomedical Science & Human Body Systems**

The Medical Interventions course will provide opportunities for students to investigate the variety of interventions involved in the prevention, diagnosis, and treatment of disease as they follow the lives of a fictitious family. Students will experience a wide range of interventions related to Immunology, Surgery, Genetics, Pharmacology, Medical Devices, and Diagnostics through scenarios. Case scenario interventions may range from simple diagnostic tests to treatment of complex diseases and disorders. Lifestyle choices and preventive measures are emphasized throughout the course as well as the important role scientific thinking and engineering design play in the development of interventions of the future. This class provides the opportunity for dual weighting upon successful completion.

**MEDICAL INTERVENTIONS, HONORS (PLTW)**

**Grade: 10, 11, 12**

**5582CTHW**

**Semesters: 2      Credit: 1**

**Prerequisite: Successful completion of Principles of Biomedical Science & Human Body Systems, Honors**

Throughout the Medical Intervention course, student projects investigate various medical interventions that extend and improve quality of life, including gene therapy, pharmacology, surgery, prosthetics, rehabilitation, and supportive care. The course explores the design and development of various medical interventions, including vascular stents, cochlear implants, and prosthetic limbs. In addition, students review the history of organ transplants and gene therapy, and stay updated on cutting edge developments via current scientific literature. Computers and the Internet are used extensively throughout the course. Students will conduct an independent research project around a medical problem to seek a solution for a medical need and present in a public venue, local, state and regional competitions. This course offers the opportunity to earn college credit. Upon completion of the course, if your grade in the course and your score on the national end of course assessment meet the criteria set by Project Lead the Way and partnering institutions, the instructor of your class will provide you with information to apply for college credit. It is the responsibility of the student to contact the partnering institution for college credit. Each post-secondary institution charges a fee for awarding of credit. The student is responsible for any costs associated with awarding college credit. The student is also responsible for ensuring that credits earned will transfer to the institution that the student is planning to attend. The instructor of your class will provide you with specific information regarding the criteria for dual credit weighting as well as information about partnering institutions. This curriculum, methods, and assessments indicate an increased depth of rigor, complexity, challenges, and creativity beyond the CP level course. This course is designed to accelerate, extend, and deepen the learning opportunities for students exhibiting superior ability. The curriculum places emphasis on critical and analytical thinking, rational decision making, and inductive and deductive reasoning. This class provides the opportunity for dual weighting upon successful completion.

**BIOMEDICAL INNOVATION (PLTW)**

**Grade: 10, 11, 12**

**5583CTCW**

**Semesters: 2      Credit: 1**

**Prerequisite: Successful completion of Principles of Biomedical Science, Human Body Systems. Must be concurrently enrolled in Medical Interventions.**

Biomedical Innovation is the capstone course for the Project Lead the Way (PLTW) Biomedical Sciences program for high school students. Students design innovative solutions for the health challenges of the 21st century. They work through progressively challenging open-ended problems, addressing topics such as clinical medicine, physiology, biomedical engineering, and public health. Students have the opportunity to work on an independent project with a mentor or advisor from a university, hospital, research institution, or the biomedical industry

#### **BIOMEDICAL INNOVATION, HONORS (PLTW)**

**Grade: 10, 11, 12**

**5583CTHW**

**Semesters: 2      Credit: 1**

**Prerequisite: Successful completion of Principles of Biomedical Science Honors, Human Body Systems Honors. Must be concurrently enrolled in Medical Interventions.**

In this capstone course, students apply their knowledge and skills to answer questions or to solve problems related to the biomedical sciences. They will consult with a mentor or advisor from a university, hospital, physician's offices, or industry as they complete their work. Students are expected to present the results of their work to an adult audience, which may include representatives from the local health care or business community or the school Biomedical Advisory Committee and will compete in local, state and regional competitions. A capstone research project is required for all students. Students must provide their own transportation. This curriculum, methods, and assessments indicate an increased depth of rigor, complexity, challenges, and creativity beyond the CP level course. This course is designed to accelerate, extend, and deepen the learning opportunities for students exhibiting superior ability. The curriculum places emphasis on critical and analytical thinking, rational decision making, and inductive and deductive reasoning.

### **HOSPITALITY & TOURISM CAREER CLUSTER**

#### **CULINARY ARTS MANAGEMENT 1**

**Grade: 10, 11**

**5720C1CD**

**Semesters: 2      Credit: 2**

**Prerequisite: Algebra 1 or Foundations in Algebra**

Culinary Arts Management 1 prepares students for gainful employment and/or entry into postsecondary education in the food production and service industry. Content provides students the opportunity to acquire marketable skills by examining both the industry and its career opportunities. Laboratory experiences simulate commercial food production and service operations. Integration of the Family and Consumer Sciences student organization, Family Career and Community Leaders of America (FCCLA) provides leadership and entrepreneurship experiences. Participation in the career & technology organization SkillsUSA provides the students an opportunity to compete and display professional baking techniques.

#### **CULINARY ARTS MANAGEMENT 2**

**Grade: 11, 12**

**5721C2CD**

**Semesters: 2      Credit: 2**

**Prerequisite: Culinary Arts Management 1**

Culinary Arts Management 2 is an advanced level course that prepares the serious culinary student for gainful employment and/or entry into postsecondary education. Content provides students the opportunity to acquire marketable skills by examining both the industry and its career options. Students have opportunities to develop skills in workplace settings. Integration of the Family and Consumer Sciences student organization, Family Career and Community Leaders of America (FCCLA) provides leadership and entrepreneurship experiences. Participation in the career & technology organization SkillsUSA provides the students an opportunity to compete and display professional baking techniques.

### **INFORMATION TECHNOLOGY CAREER CLUSTER**

#### **NETWORKING FUNDAMENTALS**

**Grade: 10, 11**

**531000CW**

**Semesters: 1      Credit: 1**

**Prerequisite: Algebra 1 or Foundations in Algebra**

Students in the Networking program will perform networking tasks commonly performed by systems administrators, network administrators, network engineers and related careers. Students manage hardware and software network components including IP configuration, setting up wireless and wired networks, managing networks, basic network security, software updates, hardware upgrades and network protocols. Students will learn about configuring and maintaining networks in home and corporate environments. Upon completion of the two courses, students will be prepared to earn nationally recognized industry certifications.

**NETWORKING FUNDAMENTALS, HONORS****Grade: 10, 11****531000HW****Semesters: 1      Credit: 1****Prerequisite: Algebra 1 or Foundations in Algebra, English 1**

Networking 1 is designed to provide students with classroom and laboratory experience in current and emerging networking technologies. Students benefit most from the curriculum if they possess a strong background in reading, math, and problem-solving skills. Instruction includes networking media, topologies, network operating systems, models and protocols, codes and standards, addressing, diagnostics, routing, WAN services, network security, and leadership skills. In addition, instruction and training are provided in the proper care, maintenance, and use of networking software, tools, and equipment. Topics in Networking 1 are considered foundational concepts that are covered on the Cisco Certified Networking Associate (CCNA) certification exam. This curriculum, methods, and assessments indicate an increased depth of rigor, complexity, challenges, and creativity beyond the CP level course. This course is designed to accelerate, extend, and deepen the learning opportunities for students exhibiting superior ability. The curriculum places emphasis on critical and analytical thinking, rational decision making, and inductive and deductive reasoning.

**ADVANCED NETWORKING****Grade: 10, 11, 12****531100CW****Semesters: 1      Credit: 1****Prerequisite: Successful completion of Networking Fundamentals**

Students in the Networking program will perform networking tasks commonly performed by systems administrators, network administrators, network engineers and related careers. Students manage hardware and software network components including IP configuration, setting up wireless and wired networks, managing networks, basic network security, software updates, hardware upgrades and network protocols. Students will learn about configuring and maintaining networks in home and corporate environments. Upon completion of the two courses, students will be prepared to earn nationally recognized industry certifications. One computer per student with Internet access should be available.

**ADVANCED NETWORKING, HONORS****Grade: 10, 11, 12****531100HW****Semesters: 1      Credit: 1****Prerequisite: Successful completion of Networking 1 Honors**

This course is designed to provide students with more classroom and laboratory experience in current and emerging networking technologies. Students who continue in Networking 2 design and build complex networks. Upon successful completion of this course, students are able to seek employment or further their education and training in the information technology field. Particular emphasis is given to the use of critical thinking skills and problem-solving techniques found in math and communication programs. Networking 2 Honors prepares students to pass the Cisco Certified Networking Associate (CCNA) certification exam. This curriculum, methods, and assessments indicate an increased depth of rigor, complexity, challenges, and creativity beyond the CP level course. This course is designed to accelerate, extend, and deepen the learning opportunities for students exhibiting superior ability. The curriculum places emphasis on critical and analytical thinking, rational decision making, and inductive and deductive reasoning.

**CYBER SECURITY FUNDAMENTALS****Grade: 11, 12****537000CW****Semesters: 1      Credit: 1****Prerequisite: Successful completion of Advanced Networking**

In the Cyber Security Fundamentals course, students examine the core concepts and terminology of cyber security and information assurance, integrating the importance of user involvement, network architecture, threats, and security; operational and system security; cryptography; contingency planning; application, data, and host security; access control and identity management; and a broad range of other topics. Upon completion of two cybersecurity courses, students will be prepared to earn nationally-recognized industry certifications.

**CYBER SECURITY FUNDAMENTALS, HONORS****Grade: 11, 12****537000HW****Semesters: 1      Credit: 1****Prerequisite: Successful completion of Advanced Networking Honors**

In the Cyber Security Fundamentals course, students examine the core concepts and terminology of cyber security and information assurance, integrating the importance of user involvement, network architecture, threats, and security; operational and system security; cryptography; contingency planning; application, data, and host security; access control and identity management; and a broad range of other topics. Upon completion of two cybersecurity courses, students will be prepared to earn nationally-recognized industry certifications.

**ADVANCED CYBER SECURITY****Grade: 11, 12****537200CW****Semesters: 1      Credit: 1****Prerequisite: Successful completion of Cyber Security Fundamentals**

In the Computer and Information Systems Security/Information Assurance program, students examine the core concepts and terminology of cyber security and information assurance, integrating the importance of user involvement, network architecture, threats, and security; operational and system security; cryptography; contingency planning; application, data, and host security; access control and identity management; and a broad range of other topics. Upon completion of the two courses, students will be prepared to earn nationally recognized industry certifications.

#### **ADVANCED CYBER SECURITY, HONORS**

**Grade: 11, 12**

**537200HW**

**Semesters: 1      Credit: 1**

**Prerequisite: Successful completion of Cyber Security Fundamentals, Honors**

This course explores the field of information security and assurance with updated content including new innovations in technology and methodologies. It builds on existing concepts introduced in Cyber Security Fundamentals and expands into malware threats, cryptography, organizational security, and wireless technologies. This is the second of two courses that prepare the student to take the CompTIA Security+ certification exam. Advanced Cyber Security Honors class prepares students to pass the Cisco Certified Network Associate Security (CCNAS) certification exam. There will be additional topics covered that are beyond the scope of the CCNAS exam. Some assignments will be geared toward the CompTIA Security Plus certification exam. This curriculum, methods, and assessments indicate an increased depth of rigor, complexity, challenges, and creativity beyond the CP level course. This course is designed to accelerate, extend, and deepen the learning opportunities for students exhibiting superior ability. The curriculum places emphasis on critical and analytical thinking, rational decision making, and inductive and deductive reasoning.

### **LAW, PUBLIC SAFETY, CORRECTIONS, & SECURITY CAREER CLUSTER**

#### **FIREFIGHTER 1**

**Grade: 10, 11**

**651400CD**

**Semesters: 2      Credit: 2**

**Prerequisite: Algebra 1 or Foundations in Algebra**

**MUST BE 16 YEARS OF AGE BY NOVEMBER 1 OF YEAR OF ENROLLMENT; MUST COMPLETE THE SCFA MEDICAL EXAM PRIOR TO NOVEMBER 1 OF YEAR OF ENROLLMENT**

This program prepares individuals to do the work of fire fighters. Firefighter I and II courses intended to achieve National Fire Protection Agency (NFPA) certification must be conducted using curriculum that addresses the NFPA standards. Firefighter I, Firefighter II, Hazardous Materials Awareness (HMA), Hazardous Materials Operations (HMO) and Basic Auto Extrication (BAE 3330) curriculum materials can be acquired from the South Carolina Fire Academy (SCFA). For complete descriptions of SCFA's courses, see the Academy's online catalog at SC Department of Labor, Licensing and Regulations. Curriculum for First Aid/Cardiopulmonary Resuscitation (CPR) prerequisite training may be based on any recognized accredited course, such as those offered through the American Heart Association or American Red Cross. Hazardous Materials Awareness and Hazardous Materials Operations prerequisites must comply with NFPA 472, Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents.

#### **FIREFIGHTER 2**

**Grade: 11, 12**

**651500CD**

**Semesters: 2      Credit: 2**

**Prerequisite: Firefighter 1 certification (FF1)**

**MUST COMPLETE THE SCFA MEDICAL EXAM PRIOR TO NOVEMBER 1 OF YEAR OF ENROLLMENT**

This program prepares individuals to do the work of fire fighters. Firefighter I and II courses intended to achieve National Fire Protection Agency (NFPA) certification must be conducted using curriculum that addresses the NFPA standards. Firefighter I, Firefighter II, Hazardous Materials Awareness (HMA), Hazardous Materials Operations (HMO) and Basic Auto Extrication (BAE 3330) curriculum materials can be acquired from the South Carolina Fire Academy (SCFA). For complete descriptions of SCFA's courses, see the Academy's online catalog at SC Department of Labor, Licensing and Regulations. Curriculum for First Aid/Cardiopulmonary Resuscitation (CPR) prerequisite training may be based on any recognized accredited course, such as those offered through the American Heart Association or American Red Cross. Hazardous Materials Awareness and Hazardous Materials Operations prerequisites must comply with NFPA 472, Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents.

#### **INTRODUCTION TO LAW, PUBLIC SAFETY, CORRECTIONS, & SECURITY**

**Grade Level: 9**

**650500CW**

**Semesters: 1      Credits: 1**

**Prerequisite: None**

Introduction to Law, Public Safety, Corrections and Security and Law Enforcement Services provides basic career information in public safety including corrections, emergency and fire management, security and protection, law enforcement, and legal services. Additionally, students will develop a personal plan for a career in public safety. The course includes skills in each area of Law Enforcement Services and Fire Fighter and the community to help deliver instruction to the students. English language arts are reinforced, and Work-based learning strategies appropriate for this course include job shadowing. Apprenticeship and cooperative

education are not available for this course. SkillsUSA competitive events, community service, and leadership activities provide the opportunity to apply essential standards and workplace readiness skills through authentic experiences.

#### **LAW ENFORCEMENT SERVICES 1**

**Grade: 10, 11**

**651000CD**

**Semesters: 2      Credit: 2**

**Prerequisite: Algebra 1 or Foundations in Algebra**

Law and Enforcement Services 1 and 2 prepare individuals to perform the duties of police and public security officers, including patrol and investigative activities, traffic control, crowd control and public relations, witness interviewing, evidence collection and management, basic crime prevention methods, weapon and equipment operations and maintenance, report preparation and other routine law enforcement responsibilities.

#### **LAW ENFORCEMENT SERVICES 2**

**Grade: 11, 12**

**651100CD**

**Semesters: 2      Credit: 2**

**Prerequisite: Successful completion of Law Enforcement Services 1**

Law and Enforcement Services 1 and 2 prepare individuals to perform the duties of police and public security officers, including patrol and investigative activities, traffic control, crowd control and public relations, witness interviewing, evidence collection and management, basic crime prevention methods, weapon and equipment operations and maintenance, report preparation and other routine law enforcement responsibilities.

### **MANUFACTURING CAREER CLUSTER**

The Integrated Production Technologies Program is a collaboration with Midlands Technical College (MTC) Computer Numerical Control (CNC) Operator Program. Students who successfully pass all four courses will obtain a certificate from MTC Corporate and Continuing Education Department. Students also have the opportunity to achieve several industry certifications.

#### **INTEGRATED PRODUCTION TECHNOLOGIES 1: BLUEPRINT & PRECISION MEASUREMENT**

**Grade: 10, 11**

**6222CTCW**

**Semesters: 1      Credit: 1**

**Prerequisite: Algebra 1 or Foundations in Algebra**

This course will engage students in the use of modern technologies in the design and improvement of products. An introductory course in blueprint reading and precision measuring tools. This course will take you through the alphabet of lines, views, and general rules for reading engineering blueprints. This course will also provide hands-on training in the use of micrometers, calipers, height gages, indicators, and various transfer gages.

#### **INTEGRATED PRODUCTION TECHNOLOGIES 2: MACHINE MILLING**

**Grade: 10, 11**

**6223CTCW**

**Semesters: 1      Credit: 1**

**Prerequisite: Successful completion of Integrated Production Technologies 1**

This course provides opportunities for students to apply the technologies that are found in modern clean, production environments. Learn the set-up and basic working knowledge of vertical mills. Learn proper safety, care, set-up, and operation of manual machine shop mills. An excellent course for students with little machining background or students taking the CNC Operator/Programmer Certificate program.

#### **INTEGRATED PRODUCTION TECHNOLOGIES 3: CNC MACHINING & PROGRAMMING**

**Grade: 10, 11, 12**

**6224CTCW**

**Semesters: 1      Credit: 1**

**Prerequisite: Successful completion of Integrated Production Technologies 2**

This course provides opportunities for students to learn the set-up and basic working knowledge of machining lathes. Learn proper safety, care, set-up, and operation of manual turning lathe. Students will gain the knowledge to become a CNC operator/programmer. Topics covered: shop math, right angle trig., English/Metric conversion tooling for mills and lathes, CNC offsets, cutting speed and feed calculations, inter-working, and functionality of the actual CNC machine components.

#### **INTEGRATED PRODUCTION TECHNOLOGIES 4: ADVANCED CNC PROGRAMMING**

**Grade: 11, 12**

**6225CTCW**

**Semesters: 1      Credit: 1**

**Prerequisite: Successful completion of Integrated Production Technologies 3**

Students will learn how to Transform blueprints into CNC machine programs by designing your own generated CNC programs on computer-based simulators in the classroom. Topics covered include: machine language (G & M codes), work coordinates, various types of offsets, cutter compensation, canned cycles, etc. Students will utilize your new knowledge to write CNC programs, select tooling, and set up the CNC equipment to produce parts to

specifications from your own CNC program.

### **WELDING TECHNOLOGY 1**

**Grade: 10, 11**

**6340CTCW**

**Semesters: 1      Credit: 1**

**Prerequisite: Algebra 1 or Foundations in Algebra**

Welding Technology is designed to provide students with the skills and knowledge to effectively perform cutting and welding applications used in the construction industry or in advanced manufacturing. Students will develop proficiency in fundamental safety practices in welding, interpreting drawings, creating computer-aided drawings, identifying and using joint designs, efficiently laying out parts for fabrication. This program will provide the students with skills in basic Shielded metal arc welding (SMAW), gas metal arc welding (GMAW), Flux core arc welding (FCAW), Gas tungsten arc welding (GTAW), as well as quality control methods.

### **WELDING TECHNOLOGY 2**

**Grade: 10, 11**

**6341CTCW**

**Semesters: 1      Credit: 1**

**Prerequisite: Successful completion of Welding Technology 1**

Welding Technology is designed to provide students with the skills and knowledge to effectively perform cutting and welding applications used in the construction industry or in advanced manufacturing. Students will develop proficiency in fundamental safety practices in welding, interpreting drawings, creating computer-aided drawings, identifying and using joint designs, efficiently laying out parts for fabrication. This program will provide the students with skills in basic Shielded metal arc welding (SMAW), gas metal arc welding (GMAW), Flux core arc welding (FCAW), Gas tungsten arc welding (GTAW), as well as quality control methods.

### **WELDING TECHNOLOGY 3**

**Grade: 11, 12**

**6342CTCW**

**Semesters: 1      Credit: 1**

**Prerequisite: Successful completion of Welding Technology 2**

Welding Technology is designed to provide students with the skills and knowledge to effectively perform cutting and welding applications used in the construction industry or in advanced manufacturing. Students will develop proficiency in fundamental safety practices in welding, interpreting drawings, creating computer-aided drawings, identifying and using joint designs, efficiently laying out parts for fabrication. This program will provide the students with skills in basic Shielded metal arc welding (SMAW), gas metal arc welding (GMAW), Flux core arc welding (FCAW), Gas tungsten arc welding (GTAW), as well as quality control methods.

### **WELDING TECHNOLOGY 4**

**Grade: 11, 12**

**6343CTCW**

**Semesters: 1      Credit: 1**

**Prerequisite: Successful completion of Welding Technology 3**

Welding Technology is designed to provide students with the skills and knowledge to effectively perform cutting and welding applications used in the construction industry or in advanced manufacturing. Students will develop proficiency in fundamental safety practices in welding, interpreting drawings, creating computer-aided drawings, identifying and using joint designs, efficiently laying out parts for fabrication. This program will provide the students with skills in basic Shielded metal arc welding (SMAW), gas metal arc welding (GMAW), Flux core arc welding (FCAW), Gas tungsten arc welding (GTAW), as well as quality control methods.

## **SCIENCE, TECHNOLOGY, ENGINEERING, & MATHEMATICS CAREER CLUSTER**

### **CLEAN ENERGY 1: CLEAN ENERGY SYSTEMS**

**Grade: 9, 10, 11, 12**

**6380CTCW**

**Semesters: 1      Credit: 1**

**Prerequisite: Algebra 1 or Foundations in Algebra, English 1 concurrently enrolled**

Clean Energy Systems exposes students to three sources of renewable energy: wind, solar and biofuels. Working with solar, thermal, chemical, and mechanical sources of clean energy teaches students how to apply physics, geography, chemistry, biology, geometry, algebra, and engineering fundamentals. Students learn the most efficient and appropriate use of energy production as they explore the relevant relationships among work, power, and energy. Students will engage in a wide variety of hands-on projects and lab activities that both test their knowledge and illustrate the interrelationships between the various forms of clean energy.

### **CLEAN ENERGY 1: CLEAN ENERGY SYSTEMS, HONORS**

**Grade: 9, 10, 11, 12**

**6380CTHW**

**Semesters: 1      Credit: 1**

**Prerequisite: Algebra 1 or Foundations in Algebra, English 1 concurrently enrolled**

This introductory honors course focuses on training students in the foundational concepts of clean energy production and natural resource conservation. Students regularly engage in authentic and realistic work assignments encountered in the workplace. Student teams complete a variety of challenging engineering projects that require varied learning activities that apply both technical and academic knowledge and skills. Topics covered include the common major sources of renewable energy such as wind, solar, and biofuels. It is recommended that students have a physical science credit and a strong science and math background for this course. This curriculum, methods, and assessments indicate an increased depth of rigor, complexity, challenges, and creativity beyond the CP

level course. This course is designed to accelerate, extend, and deepen the learning opportunities for students exhibiting superior ability. The curriculum places emphasis on critical and analytical thinking, rational decision making, and inductive and deductive reasoning.

#### **CLEAN ENERGY 2: CLEAN ENERGY APPLICATIONS**

**Grade: 9, 10, 11, 12**

**6381CTCW**

**Semesters: 1      Credit: 1**

**Prerequisite: Successful completion of Clean Energy 1: Clean Energy Systems**

Clean Energy Applications builds on the foundation of Course 1 and introduces nuclear power, steam generation, fuel cells, geothermal power, waterpower, AC/DC power generation, heat transfer and the laws of thermodynamics. In addition, students now use chemical and thermal energy principles to create, store and use energy efficiently to power a variety of mechanical and electrical devices. Students will engage in a variety of hands-on design projects to demonstrate principles using advanced technology hardware and software.

#### **CLEAN ENERGY 2: CLEAN ENERGY APPLICATIONS, HONORS**

**Grade: 9, 10, 11, 12**

**6381CTHW**

**Semesters: 1      Credit: 1**

**Prerequisite: Successful completion of Clean Energy 1: Clean Energy Systems**

This honors course serves as the second foundational course in the four- course sequence of the Clean Energy Technology program. The course builds upon knowledge and skills acquired in Clean Energy Systems while introducing new key concepts such as nuclear power, geothermal energy, bioenergy, fuel cells, and water power. Students regularly engage in authentic and realistic work assignments encountered in the workplace. Student teams complete a variety of challenging engineering projects that require varied learning activities that apply both technical and academic knowledge and skills. It is recommended that students have a physical science credit and a strong science and math background for this course. This curriculum, methods, and assessments indicate an increased depth of rigor, complexity, challenges, and creativity beyond the CP level course. This course is designed to accelerate, extend, and deepen the learning opportunities for students exhibiting superior ability. The curriculum places emphasis on critical and analytical thinking, rational decision making, and inductive and deductive reasoning.

#### **CLEAN ENERGY 3: CLEAN ENERGY STRATEGIES**

**Grade: 10, 11, 12**

**6382CTCW**

**Semesters: 1      Credit: 1**

**Prerequisite: Successful completion of Clean Energy 2: Clean Energy Applications**

Clean Energy Strategies students utilize applicable skills from the foundational courses to tackle challenges associated with the implementation of clean energy technology. The hands-on projects encountered during this course will require students to address specific issues related to providing portable power in any situation, developing new energy storage systems, increasing the efficiency of the modern home, and designing more energy efficient buildings and homes.

#### **CLEAN ENERGY 3: CLEAN ENERGY STRATEGIES, HONORS**

**Grade: 10, 11, 12**

**6382CTHW**

**Semesters: 1      Credit: 1**

**Prerequisite: Successful completion of Clean Energy 2: Clean Energy Applications, Honors**

This course will use the skills learned from the foundational courses to research, design, build, and evaluate solutions to problems encountered when utilizing alternative energy. Advanced topics including green building analysis, hybrid energy systems, and solar concentration devices that have not been introduced in the foundational courses will be analyzed. Students will define problems related to clean energy technologies, conduct extensive research, find potential solutions, implement necessary programming applications, and present findings in public venues. This curriculum, methods, and assessments indicate an increased depth of rigor, complexity, challenges, and creativity beyond the CP level course. This course is designed to accelerate, extend, and deepen the learning opportunities for students exhibiting superior ability. The curriculum places emphasis on critical and analytical thinking, rational decision making, and inductive and deductive reasoning.

#### **CLEAN ENERGY 4: CLEAN ENERGY INNOVATIONS**

**Grade: 10, 11, 12**

**6383CTCW**

**Semesters: 1      Credit: 1**

**Prerequisite: Successful completion of Clean Energy 3: Clean Energy Strategies**

Clean Energy Innovations is the fourth and final course in the Clean Energy Technology Pathway Program. The course will provide students the opportunity to work independently with open-ended, problem-solving scenarios to create an original solution in clean energy entrepreneurship or clean energy research and development. Students will collaborate with a mentor to conduct applied research around a defined research problem, develop solutions, collect, and analyze relevant data, evaluate their solutions, and present their findings in public venues and competitions.

#### **CLEAN ENERGY 4: CLEAN ENERGY INNOVATIONS, HONORS**

**Grade: 10, 11, 12**

**6383CTHW**

**Semesters: 1      Credit: 1**

**Prerequisite: Successful completion of Clean Energy 3: Clean Energy Strategies**

This course will provide students the opportunity to work with open-ended, problem-solving scenarios to create original solutions in the field of alternative energy study. Students will conduct research with a mentor around a defined problem, develop solutions, and present their findings in a public venue. This curriculum, methods, and assessments indicate an increased depth of rigor, complexity, challenges, and creativity beyond the CP level course. This course is designed to accelerate, extend, and deepen the learning opportunities for students exhibiting superior ability. The curriculum places emphasis on critical and analytical thinking, rational decision making, and inductive and deductive reasoning.

**INTRODUCTION TO ENGINEERING DESIGN (PLTW)****Grade: 9, 10, 11, 12****Prerequisite: Algebra 1**

Students dig deep into the engineering design process, applying math, science, and engineering standards to hands-on projects. They work both individually and in teams to design solutions to a variety of problems using 3D modeling software and document their work in an engineering notebook. This class provides the opportunity for dual weighting upon successful completion.

**6051CTCW****Semesters: 1      Credit: 1****INTRODUCTION TO ENGINEERING DESIGN, HONORS (PLTW)****Grade: 9, 10, 11, 12****Prerequisite: Algebra 1**

Students dig deep into the engineering design process, applying math, science, and engineering standards to hands-on projects. They work both individually and in teams to design solutions to a variety of problems using 3D modeling software and document their work in an engineering notebook. This class provides the opportunity for dual weighting upon successful completion.

**6051CTHW****Semesters 1      Credit: 1****PRINCIPLES OF ENGINEERING (PLTW)****Grade: 9, 10, 11, 12****Prerequisite: Introduction to Engineering Design**

Through problems that engage and challenge students, they explore a broad range of engineering topics including mechanisms, the strength of structures and materials, and automation. Students develop skills in problem solving, research, and design while learning strategies for design process documentation, collaboration, and presentation. This class provides the opportunity for dual weighting upon successful completion.

**6050CTCW****Semesters: 1      Credit:1****PRINCIPLES OF ENGINEERING, HONORS (PLTW)****Grade: 9, 10, 11, 12****Prerequisite: Introduction to Engineering Design**

Through problems that engage and challenge students, they explore a broad range of engineering topics including mechanisms, the strength of structures and materials, and automation. Students develop skills in problem solving, research, and design while learning strategies for design process documentation, collaboration, and presentation. This class provides the opportunity for dual weighting upon successful completion.

**6050CTHW****Semesters: 1      Credit:1****AEROSPACE ENGINEERING (PLTW)****Grade: 10, 11, 12****Prerequisite: Successful completion of Introduction to Engineering Design and Principles of Engineering.****Must be concurrently enrolled in Engineering Design and Development.**

This PLTW course propels students' learning in the fundamentals of atmospheric and space flight. As they explore the physics of flight, students bring the concepts to life by designing an airfoil, propulsion system, and rockets. They learn basic orbital mechanics using industry-standard software and explore robot systems through projects such as remotely operated vehicles. This class provides the opportunity for dual weighting upon successful completion.

**6056CTCW****Semesters: 2      Credit: 1****AEROSPACE ENGINEERING, HONORS (PLTW)****Grade: 10, 11, 12****Prerequisite: Successful completion of Introduction to Engineering Design and Principles of Engineering Honors.****Must be concurrently enrolled in Engineering Design and Development.**

This PLTW course propels students' learning in the fundamentals of atmospheric and space flight. As they explore the physics of flight, students bring the concepts to life by designing an airfoil, propulsion system, and rockets. They learn basic orbital mechanics

**6056CTHW****Semesters: 2      Credit: 1**

using industry-standard software and explore robot systems through projects such as remotely operated vehicles. This class provides the opportunity for dual weighting upon successful completion.

#### **CIVIL ENGINEERING AND ARCHITECTURE (PLTW)**

**Grade: 10, 11, 12**

**6058CTCW**

**Semesters: 2      Credit: 1**

**Prerequisite:** Successful completion of Introduction to Engineering Design and Principles of Engineering,  
**Must be concurrently enrolled in Engineering Design and Development.**

Students learn important aspects of building and site design and development, applying math, science, and standard engineering practices to design both residential and commercial projects. They document designs using 3D architecture design software. Some students have seen these designs come to life through partnerships with local housing organizations. This class provides the opportunity for dual weighting upon successful completion.

#### **CIVIL ENGINEERING AND ARCHITECTURE, HONORS (PLTW)**

**Grade: 10, 11, 12**

**6058CTHW**

**Semesters: 2      Credit: 1**

**Prerequisite:** Successful completion of Introduction to Engineering Design and Principles of Engineering Honors.  
**Must be concurrently enrolled in Engineering Design and Development.**

Students learn important aspects of building and site design and development, applying math, science, and standard engineering practices to design both residential and commercial projects. They document designs using 3D architecture design software. Some students have seen these designs come to life through partnerships with local housing organizations. This class provides the opportunity for dual weighting upon successful completion.

#### **ENGINEERING DESIGN AND DEVELOPMENT (PLTW)**

**Grade: 10, 11, 12**

**6054CTCW**

**Semesters: 2      Credit: 1**

**Prerequisite:** Successful completion of Introduction to Engineering Design and Principles of Engineering.  
**Must be concurrently enrolled in Aerospace Engineering or Civil Engineering and Architecture.**

The knowledge and skills students acquire on the "Pathway to Engineering" come together in EDD as they identify an issue and then research, design, and test a solution, ultimately presenting their solution to a panel of engineers. Students apply the professional skills they have developed to document a design process to standards. Completing EDD prepares students to be ready to take on any post-secondary program or career.

#### **ENGINEERING DESIGN AND DEVELOPMENT, HONORS (PLTW)**

**Grade: 10, 11, 12**

**6054CTHW**

**Semesters: 2      Credit: 1**

**Prerequisite:** Successful completion of Introduction to Engineering Design and Principles of Engineering Honors.  
**Must be concurrently enrolled in Aerospace Engineering or Civil Engineering and Architecture.**

The knowledge and skills students acquire on the "Pathway to Engineering" come together in EDD as they identify an issue and then research, design, and test a solution, ultimately presenting their solution to a panel of engineers. Students apply the professional skills they have developed to document a design process to standards. Completing EDD prepares students to be ready to take on any post-secondary program or career.

### **TRANSPORTATION, DISTRIBUTION, & LOGISTICS CAREER CLUSTER**

#### **AUTOMOTIVE TECHNOLOGY 1**

**Grade: 10, 11**

**6030CTCW**

**Semesters: 1      Credit: 1**

**Prerequisite:** Algebra 1 or Foundations in Algebra

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Transportation, Distribution, and Logistics career cluster. The Automotive Technology program provides technical skill proficiency and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills and occupation-specific skills, and knowledge of all aspects of the Transportation, Distribution, and Logistics career cluster.

#### **AUTOMOTIVE TECHNOLOGY 2**

**Grade: 10, 11**

**6031CTCW**

**Semesters: 1      Credit: 1**

**Prerequisite:** Automotive Technology 1

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Transportation, Distribution, and Logistics career cluster. The Automotive Technology program provides technical skill proficiency and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills and occupation-specific skills, and knowledge of all aspects of the Transportation, Distribution, and Logistics career cluster.

### **AUTOMOTIVE TECHNOLOGY 3**

**Grade: 11, 12**

**6032CTCW**

**Semesters: 1      Credit: 1**

#### **Prerequisite: Automotive Technology 2**

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Transportation, Distribution, and Logistics career cluster. The Automotive Technology program provides technical skill proficiency and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills and occupation-specific skills, and knowledge of all aspects of the Transportation, Distribution, and Logistics career cluster.

### **AUTOMOTIVE TECHNOLOGY 4**

**Grade: 11, 12**

**6033CTCW**

**Semesters: 1      Credit: 1**

#### **Prerequisite: Automotive Technology 3**

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Transportation, Distribution, and Logistics career cluster. The Automotive Technology program provides technical skill proficiency and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills and occupation-specific skills, and knowledge of all aspects of the Transportation, Distribution, and Logistics career cluster.

## **EXTENDED LEARNING OPPORTUNITIES**

### **RESEARCH 1, HONORS**

**Grade: 11, 12**

**3299C1HW**

**Semesters: 1      Credit: 1**

#### **Prerequisites: Completion of a Center program**

This course is designed for the student who has completed a CTE program at the Center and is interested in continuing project research from the completer course. Students will work independently on their own research project. Grant writing, literature searches, designing and completing experiments, technical writing and presentations, and competition for science-based scholarships will be emphasized. Students are required to present findings from research in district, regional, and state competitions.

### **RESEARCH 2, HONORS**

**Grade: 12**

**3299C2HW**

**Semesters: 1      Credit: 1**

#### **Prerequisites: Center Program Completer**

This course is designed for the student who has completed RESEARCH 1, HONORS at the Center and is interested in continuing to develop project research. With the assistance of a research advisor and research mentor, the student will continue to develop their own research project in this capstone experience. Students will work independently on their own research project. Grant writing, literature searches, designing and completing experiments, technical writing and presentations, and competition for science-based scholarships will be emphasized. Students are required to present findings from research in district, regional, and state competitions.

### **CTE WBL CREDIT BEARING INTERNSHIP**

**Grade: 11, 12**

**Semesters: 2      Credit: 1**

#### **Prerequisites:**

- **Center Program Completer with recommendation**
- **Must be 16 years of age**
- **2.0 Overall GPA**
- **Excellent attendance record**
- **Able to provide transportation to and from site**
- **Must possess a valid South Carolina Class D drivers license (Firefighting and Automotive Technology)**
- **Complete the WBL application**

CTE WBL will be offered the second semester and summer program provides students the opportunity to study an occupational program through structured work-based experiences directly related to the student's CTE completer program. The primary purpose

of the CATS WBL internship program is for the student to receive broad instruction in workplace expectations and master identified competencies related to a specific career field. CATS WBL internships may or may not include financial compensation and are scheduled based on the needs of the placement site.

|                 |                                                                                          |
|-----------------|------------------------------------------------------------------------------------------|
| <b>5190CFCW</b> | <b>Hospitality &amp; Tourism Internship, WBL</b>                                         |
| <b>5290DFCW</b> | <b>Arts, A/V Technology &amp; Communications Internship, WBL</b>                         |
| <b>5290MFCW</b> | <b>Arts, A/V Technology &amp; Communications Internship, WBL</b>                         |
| <b>5390NFCW</b> | <b>Information Technology Internship, WBL</b>                                            |
| <b>5590BFCW</b> | <b>Health Science Internship, WBL</b>                                                    |
| <b>5690CFCW</b> | <b>Agriculture, Food &amp; Natural Resources Internship, WBL</b>                         |
| <b>5690VFCW</b> | <b>Agriculture, Food &amp; Natural Resources Internship, WBL</b>                         |
| <b>6090AFCW</b> | <b>Pre-Engineering/Engineering &amp; Industrial Technology Education Internship, WBL</b> |
| <b>6090CFCW</b> | <b>Pre-Engineering/Engineering &amp; Industrial Technology Education Internship, WBL</b> |
| <b>6390NFCW</b> | <b>Information Technology Internship, WBL</b>                                            |
| <b>6490EFCW</b> | <b>Manufacturing Internship, WBL</b>                                                     |
| <b>6490TFCW</b> | <b>Manufacturing Internship, WBL</b>                                                     |
| <b>6490WFCW</b> | <b>Manufacturing Internship, WBL</b>                                                     |
| <b>6590FFCW</b> | <b>Law, Public Safety, Corrections &amp; Security Internship, WBL</b>                    |
| <b>6590LFCW</b> | <b>Law, Public Safety, Corrections &amp; Security Internship, WBL</b>                    |
| <b>6690BFCW</b> | <b>Architecture &amp; Construction Internship, WBL</b>                                   |
| <b>6690EFCW</b> | <b>Architecture &amp; Construction Internship, WBL</b>                                   |
| <b>6790TFCW</b> | <b>Transportation, Distribution &amp; Logistics Internship, WBL</b>                      |
| <b>6890CFCW</b> | <b>Science, Technology, Engineering &amp; Mathematics Internship, WBL</b>                |

\*Note-Per State Department of Education one credit will be awarded with a Local Board Approved (LBA) . The course code 5499 will be used for Senior Internship. A second credit will be awarded with a CTE credit bearing Internship Course from the above list.