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
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. Students must be prepared to work outside in various weather and climate conditions.

AGRICULTURAL & BIOSYSTEMS SCIENCE, HONORS **569100HW**
Grade: 9, 10, 11 **Semesters: 1** **Credit: 1**
Prerequisite: Algebra 1 or Foundations in Algebra, English 1
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: 9, 10, 11, 12 **Semesters: 1** **Credit: 1**
Prerequisite: Successful completion of Agricultural & Biosystems Science
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.

ANIMAL SCIENCE, HONORS **560300HW**
Grade: 9, 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 **569200CW**
Grade: 10, 11 **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, 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.

BIOSYSTEMS MECHANICS & ENGINEERING, HONORS **569200HW**
Grade: 10, 11 **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.

BIOSYSTEMS TECHNOLOGY CAREER DEVELOPMENT 1 **569300CW**
Grade: 9, 10, 11 **Semesters: 1** **Credit: 1**
Prerequisite: Algebra 1 or Foundations in Algebra
Biosystems Technology Career Development 1 is designed to teach essential concepts and understanding related to skills required 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. In addition, the course teaches basic mechanical and engineering skills and their application to scientific research. 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 are also included. Basic personal and community leadership and safety practices are included, and each student is required to design and participate in a supervised agricultural experience. Students must be prepared to work outside in various weather and climate conditions.

BIOSYSTEMS TECHNOLOGY CAREER DEVELOPMENT 1, HONORS **569300HW**
Grade: 9, 10, 11 **Semesters: 1** **Credit: 1**
Prerequisite: Algebra 1 or Foundations in Algebra, English 1
The Biosystems Technology 1 course is designed to expand upon information and material introduced in the Agricultural and Biosystems Science and Biosystems Mechanization courses. The content focuses on biological and engineering sciences important to the bioprocessing and biofuels industry, including microbial concepts, reactor design, and laboratory techniques inherent. Students will conduct research on a defined problem, seek a solution, 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. Students must be prepared to work outside in various weather and climate conditions.

BIOSYSTEMS TECHNOLOGY CAREER DEVELOPMENT 2 **569400CW**
Grade: 11, 12 **Semesters: 1 Credit: 1**
Prerequisite: Successful completion of Biosystems Technology Career Development 1
The Biosystems Technology Career Development 2 course expands upon information and material introduced in the Level 1 course. 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 as a part of the instructional program, and each student is required to design and participate in a supervised agricultural experience. Students must be prepared to work outside in various weather and climate conditions.

BIOSYSTEMS TECHNOLOGY CAREER DEVELOPMENT 2, HONORS **569400HW**
Grade: 11, 12 **Semesters: 1 Credit: 1**
Prerequisite: Successful completion of Biosystems Technology Career Development 1, Honors
The Biosystems Technology 2 course is designed to introduce the major unit operations and technology used in bioprocessing, including heat exchangers, pumps, and cell/product separation systems. The content directly expands upon information and material introduced in the Agricultural and Biosystems Science and Biosystems Mechanization courses. Students will research and define a problem in bioprocessing and produce an energy solution. 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 as a part of the instructional program. Each student is expected to design and participate in a supervised agricultural experience. 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.

BIOSYSTEM TECHNOLOGY 3 **569500CW**
Grade: 10, 11, 12 **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 **569600CW**
Grade: 10, 11, 12 **Semester: 1 Credit: 1**
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: 9, 10 **Semester: 1 Credits 1**
Prerequisite: Agriculture and Biosystems Science and Biosystems Mechanics
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: 9, 10 **Semester: 1** **Credits 1**
Prerequisite: Agriculture and Biosystems Science and Biosystems Mechanics
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. 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.

FORESTRY **564200CW**
Grade: 10, 11, 12 **Semesters: 1** **Credit: 1**
Prerequisite: Successful completion of Agricultural and Biosystems Science & Environmental and Natural Resources Management
The Forestry course is designed to teach technical knowledge and skills for entry-level positions in the production, protection, and management of timber and specialty forest resources. Typical instructional activities include hands-on experiences with assessing environmental factors affecting forest growth; cruising timber; planting trees; managing an established forest; selecting, grading and marketing forest raw materials for converting into a variety of consumer goods; harvesting timber or pulpwood; operating and maintaining equipment; managing forests for multiple purpose uses such as game preserves and recreation; participating in personal and community leadership development activities; planning and implementing a relevant school-to-work transition experience; and participating in FFA activities. Students must be prepared to work outside in various weather and climate conditions.

FORESTRY, HONORS **564200HW**
Grade: 11, 12 **Semesters: 1** **Credit: 1**
Prerequisite: Successful completion of Agricultural and Biosystems Science & Environmental and Natural Resources Management
The Forestry course is designed to teach technical knowledge and skills for entry-level positions in the production, protection, and management of timber and specialty forest resources. Typical instructional activities include hands-on experiences with assessing environmental factors affecting forest growth; cruising timber; planting trees; managing an established forest; selecting, grading and marketing forest raw materials for converting into a variety of consumer goods; harvesting timber or pulpwood; operating and maintaining equipment; managing forests for multiple purpose uses such as game preserves and recreation; participating in personal and community leadership development activities; planning and implementing a relevant school-to-work transition experience; and participating in FFA activities. 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.z

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 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.

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 Agricultural & Biosystems Science and 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. Students must be prepared to work outside in various weather and climate conditions.

SMALL ANIMAL CARE, HONORS **561200HW**
Grade: 11, 12 **Semesters: 1 Credit: 1**
Prerequisite: Successful completion of Agricultural & Biosystems Science, Honors and 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: 11, 12 **Semesters: 1 Credit: 1**
Prerequisite: Successful completion of Agricultural and Biosystems Science & 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. Students must be prepared to work outside in various weather and climate conditions.

WILDLIFE MANAGEMENT, HONORS **567400HW**
Grade: 11, 12 **Semesters: 1 Credit: 1**
Prerequisite: Successful completion of Agricultural and Biosystems Science & 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

BUILDING CONSTRUCTION 1 **6060CTCW**
Grade: 10, 11 **Semesters: 1** **Credit: 1**
Prerequisite: Algebra 1 or Foundations in Algebra
Building Construction 1 students are immersed in a curriculum from the National Center for Construction Education and Research (NCCER) where they learn the materials and processes for masonry, electrical, carpentry, plumbing, blueprint reading and estimating. Students will also be involved in extensive safety training to include hand and power tools. Instruction is supplemented by a variety of hands-on projects and activities. Students enrolled in this course have the opportunity to gain national industry certification through the NCCER training program.

BUILDING CONSTRUCTION 2 **6061CTCW**
Grade: 10, 11 **Semesters: 1** **Credit: 1**
Prerequisite: Successful completion of Building Construction 1
Building Construction 1 students are immersed in a curriculum from the National Center for Construction Education and Research (NCCER) where they learn the materials and processes for masonry, electrical, carpentry, plumbing, blueprint reading and estimating. Students will also be involved in extensive safety training to include hand and power tools. Instruction is supplemented by a variety of hands-on projects and activities. Students enrolled in this course have the opportunity to gain national industry certification through the NCCER training program. Successful completion of this training will result in a 10-hour OSHA safety certification.

BUILDING CONSTRUCTION 3 **6062CTCW**
Grade: 11, 12 **Semesters: 1** **Credit: 1**
Prerequisite: Successful completion of Building Construction 2
Building Construction 3 students continue the NCCER curriculum and develop more advanced skills through extensive hands- on applications. Additionally, introduction to the NCCER Project Management curriculum surveys management skills such as: human relations, negotiations, construction documents, estimating, scheduling, cost awareness and control, quality control, and safety. Building Construction 3 students will have the opportunity to participate in a capstone project managing and participating in the construction of scaled structures built on campus. The project may be auctioned or donated at its completion, depending on the funding source. Students enrolled in this course have the opportunity to gain national industry certification through the NCCER training program. Successful completion of this training will result in a 10-hour OSHA safety certification.

BUILDING CONSTRUCTION 4 **6063CTCW**
Grade: 11, 12 **Semesters: 1** **Credit: 1**
Prerequisite: Successful completion of Building Construction 3
Building Construction 4 students continue the NCCER curriculum and develop more advanced skills through extensive hands- on applications. Additionally, introduction to the NCCER Project Management curriculum surveys management skills such as: human relations, negotiations, construction documents, estimating, scheduling, cost awareness and control, quality control, and safety. Building Construction 4 students will have the opportunity to participate in a capstone project managing and participating in the construction of scaled structures built on campus. The project may be auctioned or donated at its completion, depending on the funding source. Students enrolled in this course have the opportunity to gain national industry certification through the NCCER training program. Successful completion of this training will result in a 10-hour OSHA safety certification.

ELECTRICITY 1 **6287CTCW**
Grade: 10, 11 **Semesters: 1** **Credit: 1**
Prerequisite: Algebra 1 or Foundations in Algebra
The Electricity 1 program is designed to prepare students for entry-level employment as an electrician and electrician helper or in related occupations. Electricity students receive instruction in communication skills, leadership skills, human relations and employability skills, safety, effective work practices, and in the installation, operation, maintenance, and repair of residential electricity systems. Laboratory activities provide instruction in all phases of residential electrical wiring in accordance with the National Electrical Code. Students enrolled in this course have the opportunity to gain national industry certification through the NCCER training program.

ELECTRICITY 2 **6288CTCW**
Grade: 10, 11 **Semesters: 1** **Credit: 1**
Prerequisite: Successful completion of Electricity 1
Electricity 2 is a continuation of concepts and skills learned in Electricity 1. Students will be exposed to residential and commercial construction and its impact on electrical wiring. This program is designed to prepare students for entry-level employment as an electrician and electrician helper or in related occupations. Electricity students receive instruction in communication skills, leadership skills, human relations and employability skills, safety, effective work practices, and in the installation, operation, maintenance, and repair of residential electricity systems. Laboratory activities provide instruction in all phases of residential electrical wiring in accordance with the National Electrical Code. Students enrolled in this course have the opportunity to gain national industry certification through the NCCER training program.

ELECTRICITY 3 **6289CTCW**
Grade: 11, 12 **Semesters: 1** **Credit: 1**
Prerequisite: Successful completion of Electricity 2
Electricity 3 is a comprehensive course providing an advanced study of the theory, terminology, equipment, and practical experience in the skills needed for careers in the electrical field. Emphasis is placed on complete residential and commercial electrical service, AC and DC circuits, safety, and the National Electrical Code. Estimating job costs may be included.

ELECTRICITY 4 **6290CTCW**
Grade: 11, 12 **Semesters: 1** **Credit: 1**
Prerequisite: Successful completion of Electricity 3
Electricity 4 is a continuation of concepts and skills learned in Electricity 3. This comprehensive course provides an advanced study of the theory, terminology, equipment, and practical experience in the skills needed for careers in the electrical field. Emphasis is placed on complete residential and commercial electrical service, AC and DC circuits, safety, and the National Electrical Code. Estimating job costs may be included.

ARTS, A/V TECHNOLOGY & COMMUNICATIONS CAREER CLUSTER

DIGITAL ART AND DESIGN 1 **6120CTCW**
Grade: 10, 11 **Semesters: 1** **Credit: 1**
Prerequisite: Algebra 1 or Foundations in Algebra
The Digital Art and Design program prepares students for careers in the graphic design field. Skills may be applied in any media, such as print, digital media, product design, packaging, etc. Most of the standards require students to combine text and graphics to communicate an effective message in the format intended for commercial reproduction. Students are also expected to use industry software and design concepts, principles, and processes to manipulate text and graphics, utilize and output appropriate file formats for Web and print, and meet client expectations.

DIGITAL ART AND DESIGN 2 **6121CTCW**
Grade: 10, 11 **Semesters: 1** **Credit: 1**
Prerequisite: Successful completion of Digital Art and Design 1
The Digital Art and Design program prepares students for careers in the graphic design field. Skills may be applied in any media, such as print, digital media, product design, packaging, etc. Most of the standards require students to combine text and graphics to communicate an effective message in the format intended for commercial reproduction. Students are also expected to use industry software and design concepts, principles, and processes to manipulate text and graphics, utilize and output appropriate file formats for Web and print, and meet client expectations.

DIGITAL ART AND DESIGN 3 **6122CTCW**
Grade: 11, 12 **Semesters: 1** **Credit: 1**
Prerequisite: Successful completion of Digital Art and Design 2
This course is a continuation of Digital Art and Design 2 and includes further study in the graphic field. It also includes portfolio development and presentation, along with a focus on job resume, application, and interview. Students may be eligible to participate in cooperative work experiences or apprenticeships, which combine career and technology training with supervised work experience in business and industry.

DIGITAL ART AND DESIGN 4 **6123CTCW**
Grade: 11, 12 **Semesters: 1** **Credit: 1**
Prerequisite: Successful completion of Digital Art and Design 3

This course is a continuation of Digital Art and Design 3 and includes further study in the graphic field. It also includes portfolio development and presentation, along with a focus on job resume, application, and interview. Students may be eligible to participate in cooperative work experiences or apprenticeships, which combine career and technology training with supervised work experience in business and industry.

MEDIA TECHNOLOGY 1 **6124CTCW**
Grade: 10, 11 **Semesters: 1** **Credit: 1**
Prerequisite: Algebra 1 or Foundations in Algebra
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.

MEDIA TECHNOLOGY 1, HONORS **6124CTHW**
Grade: 10, 11 **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 **6125CTCW**
Grade: 10, 11 **Semesters: 1** **Credit: 1**
Prerequisite: Successful completion of Media Technology 1
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 will 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. When possible, students may take field trips and have guest speakers from the media industry.

MEDIA TECHNOLOGY 2, HONORS **6125CTHW**
Grade: 10, 11 **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 **6126CTCW**
Grade: 11, 12 **Semesters: 1** **Credit: 1**
Prerequisite: Successful completion of Media Technology 2
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.

MEDIA TECHNOLOGY 3, HONORS **6126CTHW**
Grade: 11, 12 **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 **6127CTCW**
Grade: 11, 12 **Semesters: 1** **Credit: 1**
Prerequisite: Successful completion of Media Technology 3
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 an advanced, digital film short (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.

MEDIA TECHNOLOGY 4, HONORS **6127CTHW**
Grade: 11, 12 **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) **5580CTCW**
Grade: 9, 10, 11 **Semesters: 1** **Credit: 1**
Prerequisite: Biology 1 or concurrent enrollment, Algebra 1, 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.

PRINCIPLES OF BIOMEDICAL SCIENCE, HONORS (PLTW) **5580CTHW**
Grade: 9, 10, 11 **Semesters: 1** **Credit: 1**
Prerequisite: Biology 1 or concurrent enrollment, Algebra 1, 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.

HUMAN BODY SYSTEMS (PLTW) **5581CTCW**
Grade: 9, 10, 11 **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.

HUMAN BODY SYSTEMS, HONORS (PLTW) **5581CTHW**
Grade: 9, 10, 11 **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.

MEDICAL INTERVENTIONS (PLTW) **5582CTCW**
Grade: 11, 12 **Semesters: 2** **Credit: 1**
Prerequisite: Successful completion of Principles of Biomedical Science & Human Body Systems
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 before 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.

MEDICAL INTERVENTIONS, HONORS (PLTW) **5582CTHW**
Grade: 11, 12 **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.

BIOMEDICAL INNOVATION (PLTW) **5583CTCW**
Grade: 11, 12 **Semesters: 2** **Credit: 1**
Prerequisite: Successful completion of Principles of Biomedical Science, Human Body Systems. 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.

BIOMEDICAL INNOVATION, HONORS (PLTW) **5583CTHW**
Grade: 11, 12 **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: (PROSTART) **5720C1CD**
Grade: 10, 11 **Semesters: 2** **Credit: 2**
Prerequisite: Algebra 1 or Foundations in Algebra

ProStart 1 prepares students for occupations and higher education programs of study related to the entire spectrum of careers in the food industry. Instruction and intensive laboratory experience include the importance of customer service, the importance of food safety and establishing a food safety system, preparing and serving safe food, preventing accidents, kitchen basics, food service equipment and nutrition. Additional laboratory experiences include breakfast foods, salads and garnishes, fruits and vegetables, accounting and controlling food service costs. Students have experiences shadowing in local restaurants and food service establishments. Students will have the opportunity to be trained in Career Safe (Culinary Certification). This certificate enables students to be more employable and earn more hourly earnings. Closed-toed, closed-heeled shoes and culinary uniform are required.

CULINARY ARTS Management 2: (PROSTART) **5721C2CD**
Grade: 11, 12 **Semesters: 2** **Credit: 2**
Prerequisite: Culinary Arts Management 1
During ProStart 2, the students will learn about the history of food service and the lodging industry. They will be trained in a variety of culinary skills and use hands-on experiences to practice preparing many dishes with potatoes and grains, desserts and baked goods. Additionally, students will learn about stocks, soups and sauces, meat, poultry and seafood. Business skills will be of most importance with a concentration on accounting skills, purchasing and inventory control, tourism and the retail industry. The art of service will be practiced along with how to create and market an inviting menu. Students will continue to shadow and identify worksites for placement in work-based learning experiences. Students will have the opportunity to be trained in ServSafe (manager's level) and receive a certificate from the National Restaurant Association. Final certification includes securing employment at one or more food service locations in the local community. Closed-toed, closed-heeled shoes and culinary uniform are required.

BAKING & PASTRY **5723CTCD**
Grade: 11, 12 **Semesters: 2** **Credit: 2**
Prerequisite: Successful completion of Culinary Arts Management 1
Baking and Pastry for high school students is a course that provides students an opportunity to develop foundational skills needed for a seamless transition to a postsecondary program, workforce, or military. Students will develop advanced skills in safety and sanitation in addition to management and professionalism. Concepts are aligned with competencies from the American Culinary Federation (ACF) Education foundation assessment, ACF Retail Commercial Baking Certification. 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. Closed-toed, closed-heeled shoes and culinary uniform are required.

INFORMATION TECHNOLOGY CAREER CLUSTER

NETWORKING FUNDAMENTALS (CISCO) **531000CW**
Grade: 10, 11 **Semesters: 1** **Credit: 1**
Prerequisite: Algebra 1 or Foundations in Algebra
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.

NETWORKING FUNDAMENTALS (CISCO), HONORS **531000HW**
Grade: 10, 11 **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 (CISCO) **531100CW**
Grade: 10, 11, 12 **Semesters: 1** **Credit: 1**
Prerequisite: Successful completion of Networking Fundamentals
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 II prepares students to pass the Cisco Certified Networking Associate (CCNA) certification exam.

ADVANCED NETWORKING (CISCO), HONORS **531100HW**
Grade: 10, 11, 12 **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 **537000CW**
Grade: 10, 11, 12 **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 **537000HW**
Grade: 10, 11, 12 **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 **537200CW**
Grade: 10, 11, 12 **Semesters: 1** **Credit: 1**
Prerequisite: Successful completion of Cyber Security Fundamentals
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 **537200HW**
Grade: 10, 11, 12 **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 **651400CD**
Grade: 10, 11 **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 course includes an overview of the functions and history of the fire service with emphasis on fire suppression and earning the South Carolina Fire Academy Firefighter 1 certification. After meeting prerequisites (16 years of age by November 1, several on line NIMS courses, Hazmat Awareness, and First Aid/CPR.) students will be enrolled in a formal Firefighter 1 class. The class will integrate individual online learning along with practical skills sessions along with live fire training opportunities. Final evaluations will be written and practical conducted through the South Carolina Fire Academy. Upon successful completion of the testing and Hazmat Operations, a Firefighter 1 (FF1) certificate will be issued.

FIREFIGHTER 2 **651500CD**
Grade: 11, 12 **Semesters: 2** **Credit: 2**
Prerequisite: Firefighter 1 certification (FF1)
MUST COMPLETE THE SCFA MEDICAL EXAM PRIOR TO NOVEMBER 1 OF YEAR OF ENROLLMENT
This course is designed to take the student to the final level of firefighter, as recognized by the National Fire Protection Association (NFPA) and the International Fire Service Accreditation Congress (IFSAC). Subjects include incident management, building collapse and special rescue, hose tools and appliances, hydrant flow and operability, fire detection and alarm systems, fire cause, pre- incident planning, reports and communications and coordinating fire attack. Courses in advanced first aid and Basic Automobile Extrication will also be covered. Upon successful completion of written and skills testing, the firefighter will receive international recognition as a Firefighter 2.

LAW ENFORCEMENT SERVICES 1 **651000CD**
Grade: 10, 11 **Semesters: 2** **Credit: 2**
Prerequisite: Algebra 1 or Foundations in Algebra
Law Enforcement Services is the first of two courses for students who are interested in a career in law enforcement or public safety and security. Topics covered will be criminal law, demonstrating and understanding patrol procedures and law enforcement tactics. Students will also learn how to protect and document a crime scene and how to communicate verbally and in written form when employed in a law enforcement field (field interview, two-way radios, incident reports, search/arrest warrants, Miranda waivers).

LAW ENFORCEMENT SERVICES 2 **651100CD**
Grade: 11, 12 **Semesters: 2** **Credit: 2**
Prerequisite: Successful completion of Law Enforcement Services 1
Law Enforcement Services 2 enables students to experience academic and practical skills needed in the area of law enforcement. Units of study include crime scene investigation, self-defense tactics and DUI recognition.

MANUFACTURING CAREER CLUSTER

Integrated Production Technologies 1: Advanced Technology for Design and Production **6222CTCW**
Grade: 9, 10, 11 **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. Students will use three-dimensional Computer Assisted Design (CAD) software in the creation and analysis process. Students will document designs using standards set by industry for design documentation. Students will implement methods of green production and just-in-time component supply which allow for the lowest cost and highest quality products. Students will design and troubleshoot data acquisition, programmable logic control, process monitoring, automation and robotic systems. Students will incorporate sensing and vision systems, utilizing cameras and sensors to control automated systems.

Integrated Production Technologies 2: Systems of Advanced Technology **6223CTCW**
Grade: 9, 10, 11, **Semesters: 1** **Credit: 1**
Prerequisite: Successful completion of Integrated Production Technologies 1
Systems of Advanced Technology provides opportunities for students to apply the technologies that are found in modern clean, production environments. Students study effective and energy efficient control of pumping, conveyors, piping, pneumatic and hydraulic control systems. Students apply total quality management to production design to assure quality. Students also focus on properties of materials and material testing, creating documentation to support designs, examining properties and justifying material selections based on properties. Students learn that old products become the new raw materials for new products.

Integrated Production Technologies 3: Mechatronic Systems for Advanced Production **6224CTCW**
Grade: 10, 11, 12 **Semesters: 1** **Credit: 1**
Prerequisite: Successful completion of Integrated Production Technologies 2
Mechatronic Systems for Advanced Production provides opportunities for students to design cost-effective work cells incorporating automation and robotics to improve quality of final products. The advanced production in this course depends on the use and coordination of information, automation, network systems, vision and sensing systems. Students will design and create mechatronic systems and automated tooling to accomplish these advanced tasks. Students produce authentic documentation about their cyber-mechanical systems and the integration with data to control and monitor processes.

Integrated Production Technologies 4: Design for the Production of Advanced Products **6225CTCW**
Grade: 11, 12 **Semesters: 1** **Credit: 1**
Prerequisite: Successful completion of Integrated Production Technologies 3
Students will create plant designs to process and automatically assemble materials into new products. Students follow the process of developing and producing a new product from prototype to final product. They will accomplish this by creating a production flow plan that allows for the mass production of the product. Students will analyze and evaluate all aspects of the design and production processes with an emphasis on clean, lean and green production. Students will utilize data acquisition, quality control processes and Six Sigma methodology to control production.

WELDING TECHNOLOGY 1 **6340CTCW**
Grade: 10, 11 **Semesters: 1** **Credit: 1**
Prerequisite: Algebra 1 or Foundations in Algebra
This course focuses on the physical properties of metals as well as the testing of welded joints. Students learn oxyfuel and plasma cutting. They also study welding techniques (shielded metal arc, gas metal arc, gas tungsten arc and flux core arc). Students study safety issues, read blueprints and design projects. Students enrolled in this course have the opportunity to gain national industry certification through the NCCER training program and American Welding Society.

WELDING TECHNOLOGY 2 **6341CTCW**
Grade: 10, 11 **Semesters: 1** **Credit: 1**
Prerequisite: Successful completion of Welding Technology 1
Welding 2 is a continuation of concepts and skills learned during Welding 1. This course focuses on the physical properties of metals as well as the testing of welded joints. Students learn oxyfuel and plasma cutting. They also study welding techniques (shielded metal arc, gas metal arc, gas tungsten arc and flux core arc). Students study safety issues, read blueprints and design projects. Students enrolled in this course have the opportunity to gain national industry certification through the NCCER training program and American Welding Society.

WELDING TECHNOLOGY 3 **6342CTCW**
Grade: 11, 12 **Semesters: 1** **Credit: 1**
Prerequisite: Successful completion of Welding Technology 2
Welding 3 concentrates on the study of advanced cutting and welding techniques. Students fabricate projects from blueprints and design projects. Students may be eligible to participate in cooperative work experiences or apprenticeships, which combine career and technology training with supervised work experience in business and industry. Students enrolled in this course have the opportunity to gain national industry certification through the NCCER training program and American Welding Society.

WELDING TECHNOLOGY 4 **6343CTCW**
Grade: 11, 12 **Semesters: 1** **Credit: 1**
Prerequisite: Successful completion of Welding Technology 3

Welding 4 offers students the opportunity to develop advanced welding skills including aluminum welding, pipe welding, gas tungsten welding, and open groove welding. Emphasis is placed on industrial welding experiences. This course includes six weeks of off- site work-based learning during the second semester at a location where students can apply welding knowledge and skills under the supervision of a worksite mentor.

SCIENCE, TECHNOLOGY, ENGINEERING, and MATHEMATICS CAREER CLUSTER

CLEAN ENERGY 1: CLEAN ENERGY SYSTEMS **6380CTCW**
Grade: 9, 10, 11, 12 **Semesters: 1** **Credit: 1**
Prerequisite: Algebra 1 or Foundations in Algebra concurrently enrolled
This introductory course exposes students to some of the major sources of renewable energy: wind, solar, and biofuels. Students learn and apply physics, geography, chemistry, and biology fundamentals to understand the relevant relationships between work, power, and energy. The content in the course covers solar, thermal, chemical, and mechanical sources of clean energy production. Students learn the most efficient and appropriate use of energy resources, energy conversion and storage, as well as the effect of weather and geography on energy production. Students engage in a wide variety of hands-on projects and labs that both test their knowledge and illustrate the interrelationships between the various forms of alternative energy.

CLEAN ENERGY 1: CLEAN ENERGY SYSTEMS, HONORS **6380CTHW**
Grade: 9, 10, 11, 12 **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 **6381CTCW**
Grade: 9, 10, 11, 12 **Semesters: 1** **Credit: 1**
Prerequisite: Successful completion of Clean Energy 1: Clean Energy Systems
This course uses fundamentals learned during the energy systems course to solve more applied problems related to energy and power as well as covering energy topics not discussed in the Clean Energy Systems course. Students will use combinations of chemical and solar energy principles to create, store, and use energy to power a variety of mechanical and electrical devices. Key concepts introduced in this course include nuclear power, steam generation, fuel cells, geothermal power, water power, AC/DC power generation, heat transfer, and the laws of thermodynamics. Students engage in a variety of hands-on design projects to demonstrate course principles.

CLEAN ENERGY 2: CLEAN ENERGY APPLICATIONS, HONORS **6381CTHW**
Grade: 9, 10, 11, 12 **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 **6382CTCW**
Grade: 10, 11, 12 **Semesters: 1** **Credit: 1**
Prerequisite: Successful completion of Clean Energy 2: Clean Energy Applications
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.

CLEAN ENERGY 3: CLEAN ENERGY STRATEGIES, HONORS **6382CTHW**
Grade: 10, 11, 12 **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.

C**LEAN ENERGY 4: CLEAN ENERGY INNOVATIONS** **6383CTCW**
Grade: 10, 11, 12 **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.

CLEAN ENERGY 4: CLEAN ENERGY INNOVATIONS, HONORS **6383CTHW**
Grade: 10, 11, 12 **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) **6051CTCW**
Grade: 9, 10, 11, 12 **Semesters: 1** **Credit: 1**
Prerequisite: Algebra 1
Introduction to Engineering Design is the first course in the Project Lead The Way (PLTW) program. It is designed to give students the basic knowledge of drawings and software that are consistent with those used in the engineering field. Students will apply the seven stages of a design process to create solutions to challenging design problems. Using Autodesk Inventor computer software, students will draw and manipulate their own 3-dimensional models. PLTW has developed a four-year sequence of courses which, when combined with traditional mathematics and science courses in high school, introduces students to the scope, rigor and discipline of engineering and engineering technology prior to entering college. 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.

INTRODUCTION TO ENGINEERING DESIGN, HONORS (PLTW) **6051CTHW**
Grade: 9, 10, 11, 12 **Semesters 1** **Credit: 1**
Prerequisite: Algebra 1, Geometry HN and concurrent enrollment in Algebra 2 HN
Introduction to Engineering Design is the first course in the Project Lead The Way (PLTW) program. It is designed to give students the basic knowledge of drawings and software that are consistent with those used in the engineering field. Students will apply the seven

stages of a design process to create solutions to challenging design problems. Using Autodesk Inventor computer software, students will draw and manipulate their own 3-dimensional models. PLTW has developed a four-year sequence of courses which, when combined with traditional mathematics and science courses in high school, introduces students to the scope, rigor and discipline of engineering and engineering technology prior to entering college. 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.

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

This course is designed to help students understand the field of engineering/engineering technology. Students will explore various technology systems and manufacturing processes to learn how engineers and technicians use math, science, and technology in an engineering problem solving process to benefit people. The course also includes concerns about social and political consequences of technological change. The purpose of this course is to help give students a better understanding of the different fields of engineering so that they can make a more informed decision in the field they wish to pursue. 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.

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

This course is designed to help students understand the field of engineering/engineering technology. Students will explore various technology systems and manufacturing processes to learn how engineers and technicians use math, science, and technology in an engineering problem solving process to benefit people. The course also includes concerns about social and political consequences of technological change. The purpose of this course is to help give students a better understanding of the different fields of engineering so that they can make a more informed decision in the field they wish to pursue. For honors credit, students will complete additional assignments to assist them in preparation for independent research in future classes. 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.

AEROSPACE ENGINEERING (PLTW) **6056CTCW**
Grade: 10, 11, 12 **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.
The major focus of this course is to expose students to the world of aeronautics, flight and engineering through the fields of aeronautics, aerospace engineering and related areas of study. Lessons engage students in engineering design problems related to aerospace information systems, astronautics, rocketry, propulsion, the physics of space science, space life sciences, the biology of space science, principles of aeronautics, structures and materials, and systems engineering. Students work in teams utilizing hands-on activities, projects and problems and are exposed to various situations faced by aerospace engineers. In addition, students use 3D design software to help design solutions to proposed problems. Students design intelligent vehicles to learn about documenting their project, solving problems and communicating their solutions to their peers and members of the professional community. Honors students will be required to conduct independent research on an aerospace engineering problem, write an extensive research document and present findings in a public venue. 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.

AEROSPACE ENGINEERING, HONORS (PLTW) **6056CTHW**
Grade: 11, 12 **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.
The major focus of this course is to expose students to the world of aeronautics, flight and engineering through the fields of aeronautics, aerospace engineering and related areas of study. Lessons engage students in engineering design problems related to aerospace information systems, astronautics, rocketry, propulsion, the physics of space science, space life sciences, the biology of space science, principles of aeronautics, structures and materials, and systems engineering. Students work in teams utilizing hands-on activities, projects and problems and are exposed to various situations faced by aerospace engineers. In addition, students use 3D design software to help design solutions to proposed problems. Students design intelligent vehicles to learn about documenting their project, solving problems and communicating their solutions to their peers and members of the professional community. Honors students will be required to conduct independent research on an aerospace engineering problem, write an extensive research document and present findings in a public venue. 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 Wayand 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.

CIVIL ENGINEERING AND ARCHITECTURE (PLTW) **6058CTHW**
Grade: 10, 11, 12 **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.
This course provides an overview of the fields of Civil Engineering and Architecture, while emphasizing the interrelationship and dependence of both fields on each other. Students use state of the art software to solve real world problems and communicate solutions to hands-on projects and activities. This course covers topics such as: The Roles of Civil Engineers and Architects- Project Planning – Site Planning – Building Design – Project Documentation and Presentation. 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.

CIVIL ENGINEERING AND ARCHITECTURE, HONORS (PLTW) **6058CTHW**
Grade: 10, 11, 12 **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.
This course provides an overview of the fields of Civil Engineering and Architecture, while emphasizing the interrelationship and dependence of both fields on each other. Students use state of the art software to solve real world problems and communicate solutions to hands-on projects and activities. This course covers topics such as: The Roles of Civil Engineers and Architects- Project Planning – Site Planning – Building Design – Project Documentation and Presentation. 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.

ENGINEERING DESIGN AND DEVELOPMENT (PLTW) **6054CTCW**
Grade: 10, 11, 12 **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.
Engineering Design and Development is a senior level course for all students that have completed all Project Lead the Way courses. It is an engineering research course in which students work in teams for research, design, and construct a solution to an open-ended engineering problem. Students apply principles developed in the three preceding courses and are guided by a community mentor. They must present progress reports, submit a final written research report and defend their solution to a panel of outside reviewers at the end of the course. Students must participate in three different review forums including the district science fair, Region Two Science Fair, and final juried presentation to the community.

ENGINEERING DESIGN AND DEVELOPMENT, HONORS (PLTW) **6054CTHW**
Grade: 10, 11, 12 **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.
Engineering Design and Development is a senior level course for all students that have completed all Project Lead the Way courses. It is an engineering research course in which students work in teams for research, design, and construct a solution to an open-ended engineering problem. Students apply principles developed in the three preceding courses and are guided by a community mentor. They must present progress reports, submit a final written research report and defend their solution to a panel of outside reviewers at the end of the course. Students must participate in three different review forums including the district science fair, Region Two Science Fair, and final juried presentation to the community. 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.

SIEMENS ENGINEERING DESIGN 1 **04900100**
Grade: 9, 10, 11, 12 **Semesters: 1** **Credit: 1**

Prerequisite: Algebra 1 or Foundations in Algebra
This course challenges students to work in teams to solve complex design problems. Students research, design, develop, and communicate design solutions Teams use engineering software to prepare and evaluate designs and make extensive use of 3D printing to prepare models for presentation to authentic audiences. The goal of the course is the application of the tools to address unique problems allowing the students to rapidly create and analyze proposed solutions. Siemens' software and hardware are tools frequently used by industry and understanding how these tools are used in problem solving is critical.

SIEMENS MANUFACTURING AND AUTOMATION **04900200**
Grade: 9, 10, 11, 12 **Semesters: 1** **Credit: 1**
Prerequisite: Concurrently enrolled in Siemens Engineering Design 1
This course is designed to provide students with experience in the creation of a design, preparing the design for machining and designing the automation necessary to control the process. This manufacturing course will challenge students to collaboratively solve design problems by working in teams, requiring research and reporting findings, and will prepare students to obtain Siemens PLC and Solid Edge certifications. The Siemens manufacturing course will utilize the various Siemens' software as tools for problem solving and preparing solutions. The goal of the course is the application of the tools to address unique problems allowing the students to rapidly create and analyze proposed solutions.

TRANSPORTATION, DISTRIBUTION, and LOGISTICS CAREER CLUSTER

AUTOMOTIVE TECHNOLOGY 1 **6030CTCW**
Grade: 10, 11 **Semesters: 1** **Credit: 1**
Prerequisite: Algebra 1 or Foundations in Algebra
A NATEF/ASE certified course designed to introduce the general and technical education required for success in the automotive field. Class consists of classroom, lab and shop learning activities. Topics covered include: Shop Safety, Workplace Skills, Tire Rotation and Balance, Disc and Drum Brake Repair, and Introduction to Steering and Suspension.

AUTOMOTIVE TECHNOLOGY 2 **6031CTCW**
Grade: 10, 11 **Semesters: 1** **Credit: 1**
Prerequisite: Automotive Technology 1
A NATEF/ASE certified course designed to introduce the general and technical education required for success in the automotive field. Class consists of classroom, lab and shop learning activities. Topics covered include: Shop Safety, Workplace Skills, Tire Rotation and Balance, Disc and Drum Brake Repair, and Introduction to Steering and Suspension.

AUTOMOTIVE TECHNOLOGY 3 **6032CTCW**
Grade: 11, 12 **Semesters: 1** **Credit: 1**
Prerequisite: Automotive Technology 2
A NATEF/ASE certified course designed to complete the general and technical education required for success in the automotive field. The program provides students with the fundamentals necessary to pursue post-secondary education or to begin work as an apprentice technician. Topics covered include: Steering and Suspension, Electrical System Diagnosis and Repair to include Hybrid and Electric Vehicles.

AUTOMOTIVE TECHNOLOGY 4 **6033CTCW**
Grade: 11, 12 **Semesters: 1** **Credit: 1**
Prerequisite: Automotive Technology 3
A NATEF/ASE certified course designed to complete the general and technical education required for success in the automotive field. The program provides students with the fundamentals necessary to pursue post-secondary education or to begin work as an apprentice technician. Topics covered include: Steering and Suspension, Electrical System Diagnosis and Repair to include Hybrid and Electric Vehicles.

EXTENDED LEARNING OPPORTUNITIES

RESEARCH 1, HONORS **3299C1HW**
Grade: 11, 12 **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 **3299C2HW**
Grade: 12 **5190CFCW** **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 17 years of age**
- **2.0 Overall GPA**
- **Excellent attendance record**
- **Able to provide transportation to and from site**
- **Must process 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.

6090AFCW Aerospace Engineering WBL
5690CFCW Agriculture & Biosystems WBL
6790TFCW Transportation, Distribution & Logistics WBL
6090BFCW Biomedical Science WBL
6690BFCW Building Construction WBL
6090CFCW Civil Engineering WBL
6890CFCW Clean Energy WBL
5190CFCW Culinary WBL
5290DFCW Digital Art & Design WBL
6690EFCW Electricity WBL
6590FFCW Firefighter WBL
6590LFCW Law Enforcement WBL
6490TTFCW Machine Tool WBL
5290MFCW Media Technology WBL
5390NFCW Networking/ Cyber Security WBL
5690VFCW Veterinary Science WBL
6490WFCW Welding WBL

*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.