

# SEYMOUR HIGH SCHOOL



## 2024-2025 CTE CURRICULUM GUIDE

### CAREER & TECHNICAL EDUCATION

#### NLPS CTE Concentrator Courses

All students must meet these three criteria for graduation:

- 1) Earn credits necessary for a High School Diploma
- 2) Learn and Demonstrate Employability Skills
- 3) Demonstrate Postsecondary-Ready Competencies

Many will meet criteria three, “Demonstrate Postsecondary-Ready Competencies” through an NLPS CTE Concentrator. Students must earn a “C” average or higher in NLPS concentrator courses in a state-approved CTE Pathway (Principles, Concentrator A, and Concentrator B coursework). Below are NLPS pathways that SHS and the C4 program offer. For more information about Indiana Graduation Pathways, visit the [DOE website](#), or contact your SHS counselor.

Students are encouraged to explore careers based on their interests and skills, and select meaningful coursework as a result of this exploration. For an excellent resource in navigating this process, please visit [indianacareerexplorer.com/sign\\_up](http://indianacareerexplorer.com/sign_up) to take career assessments, explore a variety of industries and career paths, and discover local Indiana schools and programs that offer education and training in the desired fields of study.

*PURPLE	SHS Courses	Courses blocked together in RED <u>must</u> be taken concurrently	
*BLUE	C4 Courses - NORTH (11th/12th grades only)	*Yellow	C4 Courses - McDowell (11/12th grades only)
*Orange	C4 Courses - EAST (11th/12th grades only)	*RED	BCHS Courses

24-25 Seymour High School Next Level Programs of Study Course Sequences									
Cluster	Career Pathway	Principles		CTE Concentrator A		CTE Concentrator B		Pathway Capstone	
<a href="#">Advanced Manufacturing</a>	Industrial Automation and Robotics	7108	Principles of Advanced Manufacturing	7103	Advanced Manufacturing Technology	7106	Mechatronics Systems	7224	Industrial Automation and Robotics Capstone
<a href="#">Advanced Manufacturing</a>	Precision Machining	7109	Principles of Precision Machining	7105	Precision Machining Fundamentals	7107	Advanced Precision Machining	7219	Precision Machining Capstone
<a href="#">Advanced Manufacturing</a>	Welding Technology	7110	Principles of Welding Technology	7111	Shielded Metal Arc Welding	7101	Gas Welding Processes	7226	Welding Technology Capstone

<a href="#">Agriculture, Food and Natural Resources</a>	Agriscience - Plants or Animals	7117	Principles of Agriculture	5008	Animal Science - NLPS	5102	Food Science - NLPS		
				5170	Plant and Soil Science - NLPS	5070	Advanced Life Science, Animals (L) - NLPS		
						5074	Advanced Life Science, Plants and Soils (L) - NLPS		
						5072	Advanced Life Science: Foods - NLPS		
<a href="#">Agriculture, Food and Natural Resources</a>	Landscaping	7117	Principles of Agriculture	5132	Horticultural Science	7115	Landscape and Turf Management		
<a href="#">Agriculture, Food and Natural Resources</a>	Veterinary Science	7280	Principles of Veterinary Science	7281	Veterinary Science	5070	Advanced Life Science, Animals (L)	7282	Veterinary Science Capstone
<a href="#">Architecture and Construction</a>	Construction Trades - Carpentry	7130	Principles of Construction Trades	7123	Construction Trades: General Carpentry	7122	Construction Trades: Framing and Finishing	7242	Construction Trades Capstone
<a href="#">Arts, AV Tech and Comm</a>	Digital Design	7140	Principles of Digital Design	7141	Digital Design Graphics	7138	Interactive Media Design	7246	Digital Design Capstone
		7140	Principles of Digital Design	7141	Digital Design Graphics	5550	Graphic Design and Layout - NLPS	7246	Digital Design Capstone
<a href="#">Arts, AV Tech and Comm</a>	Fashion Textiles and Design	7301	Principles of Fashion and Textiles	7302	Textiles, Apparel, and Merchandising	7303	Advanced Textiles		
<a href="#">Arts, AV Tech and Comm</a>	Radio and Television Broadcasting	7139	Principles of Broadcasting	7306	Audio and Video Production Essentials	7307	Mass Media Production	7308	Radio & TV Broadcasting Capstone
<a href="#">Finance</a>	Finance and Investment	4562	Principles of Business Management	4524	Accounting Fundamentals	5258	Finance and Investment		
<a href="#">Marketing</a>	Entrepreneurship	7154	Principles of Entrepreneurship	7148	New Venture Development	7147	Small Business Operations	7201	Business Management Capstone
<a href="#">Marketing</a>	Marketing and Sales	4562	Principles of Business Management	5914	Marketing Fundamentals	7145	Digital Marketing		
<a href="#">Business Management and Administration</a>	Business Administration	4562	Principles of Business Management	5914	Marketing Fundamentals	4524	Accounting Fundamentals		
<a href="#">Education and Training</a>	Early Childhood	7160	Principles of Early Childhood Education	7158	Early Childhood Education Curriculum	7159	Early Childhood Education Guidance		

<a href="#">Education and Training</a>	Education Professions	7161	Principles of Teaching	7157	Child & Adolescent Development	7162	Teaching & Learning		
<a href="#">Health Sciences</a>	Dental Careers	7315	Principles of Dental Careers	7316	Dental Careers Fundamentals	7317	Advanced Dental Careers	7318	Dental Careers Capstone
<a href="#">Health Sciences</a>	Pre-Nursing	7168	Principles of Healthcare	5274	Medical Terminology	7166	Healthcare Specialist: CNA	7255	Healthcare Specialist Capstone: CNA
<a href="#">Health Sciences</a>	Pre-Nursing	7168	Principles of Healthcare	5275	Medical Terminology	7164	Certified Clinical Medical Assistant (CCMA)	7255	Healthcare Specialist Capstone: CCMA
<a href="#">Hospitality and Tourism</a>	Culinary Arts	7173	Principles of Culinary and Hospitality	7171	Nutrition	7169	Culinary Arts		
<a href="#">Human Services</a>	Barbering	7330	Principles of Barbering and Cosmetology	7331	Barbering and Cosmetology Fundamentals	7332	Advanced Cosmetology	7334	Barbering and Cosmetology Capstone
<a href="#">Information Tech</a>	Cybersecurity	7183	Principles of Computing	7179	Cybersecurity Fundamentals	7178	Advanced Cybersecurity	7180	Information Technology Fundamentals
<a href="#">Law, Public Safety, Corrections, and Security</a>	Criminal Justice	7193	Principles of Criminal Justice	7191	Law Enforcement Fundamentals	7188	Corrections and Cultural Awareness	7231	Criminal Justice Capstone
<a href="#">STEM</a>	Design Technology	4802	Introduction to Engineering Design	7196	Mechanical and Architectural Design	7197	BIM Architecture	7225	Architectural Design Capstone
<a href="#">STEM</a>	Engineering	4802	Introduction to Engineering Design	5644	Principles of Engineering	5538	Digital Electronics		
						5650	Civil Engineering and Architecture		
<a href="#">Transportation, Distribution, and Logistics</a>	Automotive Services	7213	Principles of Automotive Services	7205	Brake Systems	7212	Steering and Suspensions	7375	Automotive Service Capstone
<a href="#">Transportation, Distribution, and Logistics</a>	Commercial Driver's License	7386	Principles of Transportation & Logistics	7387	Commercial Drivers Operations	7388	Advanced Commercial Drivers Operation		

## ADVANCED MANUFACTURING

### **INTRODUCTION TO ADVANCED MANUFACTURING AND LOGISTICS - 4796**

2 CREDITS (1 PER SEMESTER)

Introduction to Advanced Manufacturing and Logistics introduces students to the field of advanced manufacturing and logistics and it explores the field's relationship to society, individuals, and the environment. Students learn to apply modern manufacturing processes in order to obtain resources and change them into industrial materials, industrial products, and consumer products. Students investigate the properties of engineered materials. Students study six major types of material processes: casting and molding, forming, separating, conditioning, finishing, and assembling. After gaining a working knowledge of these processes, students are introduced to the logistical and business principles utilized in today's advanced manufacturing industry. Students gain a basic understanding of tooling, electrical skills, operation skills, inventory principles, Material Safety Data Sheets (MSDS), chart and graph reading, and other Manufacturing Skill Standards Council (MSSC) concepts. There is also an emphasis placed on the flow process principles, material movement, safety, and related business operations. Students have the opportunity to develop the characteristics employers seek as well as skills that will help them in future endeavors.

- Recommended Grade(s): 9, 10
- Counts as a directed elective or elective for all diplomas
- **Note: Students interested in welding or machining are encouraged to take this course during freshman year.**

### ***Industrial Automation & Robotics (C4 Program)***

### **PRINCIPLES OF ADVANCED MANUFACTURING - 7108**

2 Credits (1 PER SEMESTER)

Principles of Advanced Manufacturing includes classroom and laboratory experiences, which are focused on industrial technology and manufacturing trends. Covered topics include safety and impact, manufacturing essentials, lean manufacturing, design principles, and careers in advanced manufacturing. Students participate in hands-on projects and team activities to learn necessary skills while using the latest industry technologies. Work-based learning experiences and industry partnerships are highly encouraged for an authentic industry experience.

- Recommended Grade(s): 11
- Recommended Prerequisites: Introduction to Advanced Manufacturing
- 2 semester course, 2 semesters required, 1 credit per semester, 2 credits maximum
- Counts as a directed elective or elective for all diplomas
- **Note: This is a C4 program held at Columbus North High School. Transportation is provided by SHS.**

### **ADVANCED MANUFACTURING TECHNOLOGY - 7103**

2 Credits (1 PER SEMESTER)

Advanced Manufacturing Technology introduces students to a variety of manufacturing processes and procedures that are used in real-world manufacturing environments. The course covers key electrical principles, (including current, voltage, resistance, power, inductance, capacitance, and transformers), as well as the basic principles of mechanical and fluid power. Additional course topics include, types of production, production materials, machining and tooling, manufacturing planning, production control, and product distribution. Students will be expected to understand the product life cycle from conception through distribution. This course also focuses on technologies used in production processes such as basic power systems, energy transfer systems, and machine operation. The course utilizes a combination of lecture, lab, online simulation, and programming to prepare students for Certified Production Technician Testing through Manufacturing Skill Standards Council (MSSC).

- Recommended Grade(s): 11
- Required Prerequisites: Principles of Advanced Manufacturing
- Counts as a directed elective or elective for all diplomas
- **Note: This is a C4 program held at Columbus North High School. Transportation is provided by SHS.**

### **MECHATRONICS SYSTEMS - 7106**

2 CREDITS (1 PER SEMESTER)

Mechatronics Systems covers the basic electrical and mechanical components and functions of a complex mechatronics system. Through a systems-based approach, students learn about the mechanical components that lead and support the flow of energy through a mechanical system. Emphasis is placed on the development of strategies for increasing efficiency and reducing wear and tear. After gaining an understanding of the complete system, students learn and apply troubleshooting strategies to identify, localize, and (where possible) correct malfunctions. Preventive maintenance of mechanical elements and electrical drives as well as safety issues within the system are also discussed.

- Recommended Grade: 12
- Required Prerequisites: Principles of Advanced Manufacturing; Advanced Manufacturing Technology
- Counts as a directed elective or elective for all diplomas
- **Note: This is a C4 program held at Columbus North High School. Transportation is provided by SHS.**

### **INDUSTRIAL AUTOMATION AND ROBOTICS CAPSTONE - 7224**

2 CREDITS (1 PER SEMESTER)

The Automation and Robotics Capstone focuses on the installation, maintenance, and repair of industrial robots. Students will also learn the basics of pneumatic, electro-pneumatic and hydraulic control circuits as well as the basic theory, fundamentals of digital logic, and programming of programmable logic controllers (PLCs) in a complex mechatronic system. Students will learn to identify malfunctioning robots and to apply troubleshooting strategies to identify and localize problems caused by pneumatic and hydraulic control circuits and PLC hardware. Completing the capstone course will provide students the opportunity to earn a postsecondary certificate and will prepare students to take nationally recognized industry certification exams. Hands-on projects and team activities will allow students to apply learning on the latest industry technologies. Extended work-based learning experiences and industry partnerships are highly encouraged for an authentic industry experience.

- Recommended Grade(s): 12
- Required Prerequisites: Principles of Advanced Manufacturing; Advanced Manufacturing Technology; Mechatronics Systems
- Counts as a Directed Elective or Elective for all diplomas
- Counts as a quantitative reasoning course
- **Note: This is a C4 program held at Columbus North High School. Transportation is provided by SHS.**

## ***Precision Machining***

### **PRINCIPLES OF PRECISION MACHINING (DUAL CREDIT) - 7109**

2 CREDITS (1 PER SEMESTER)

Principles of Precision Machining will instruct students in shop safety, industrial terminology, tools and machine tooling, measurement, and layout. Includes laboratory exercises to begin project completion of turning, milling, and grinding applications. This course incorporates certification assessment for the National Institute of Metalworking Skills Measurement, Materials and Safety, Job Planning, Benchwork, and Layout Certification. Applies mathematics in solving engineering and design related problems in the areas of die design, fabrication, assembly, special machinery, die casting and molds. Emphasizes geometric dimensioning and applying tolerances.

- Recommended Grade: 10, 11
- Prerequisites: Introduction to Advanced Manufacturing
- Corequisites: Precision Machining Fundamentals
- Counts as a directed elective or elective for all diplomas

### **PRECISION MACHINING FUNDAMENTALS - 7105**

2 CREDITS (1 PER SEMESTER)

Precision Machining Fundamentals will build a foundation in conventional milling and turning. Students will be instructed in the classroom on topics of shop safety, theory, industrial terminology, and calculations. Lab work will consist of the setup and operation of vertical and/or horizontal milling machines and engine lathes. This course prepares the student for the optional National Institute for Metalworking Skills (NIMS) Milling I certification that may be required for college dual credit.

- Recommended Grade(s): 10, 11
- Required Corequisites: Principles of Precision Machining
- Counts as a directed elective or elective for all diplomas
- Qualifies as a quantitative reasoning course

### **ADVANCED PRECISION MACHINING - 7107**

2 CREDITS (1 PER SEMESTER)

Advanced Precision Machining will build upon the Turning and Milling processes learned in Precision Machining Fundamentals and will build a foundation in abrasive process machines. Students will be instructed in the classroom on topics of shop safety, theory, industrial terminology, and calculations associated with abrasives. Lab work will consist of the setup and operation of bench grinders and surface grinders. Additionally, students will be introduced to Computerized Numeric Controlled (CNC) setup, operations and programming. This course prepares the student for the optional National Institute for Metalworking Skills (NIMS) Grinding I

certification that may be required for college dual credit.

- Recommended Grade(s): 11, 12
- Required Prerequisites: Principles of Precision Machining, Precision Machining Fundamentals
- Required Corequisites: Precision Machining Capstone
- Counts as a directed elective or elective for all diplomas
- Qualifies as a quantitative reasoning course

### **PRECISION MACHINING CAPSTONE - 7219**

2 Credits (1 PER SEMESTER)

The Precision Machining Capstone is an in-depth study of skills learned in Precision Machining I, with a stronger focus on CNC setup/operation/programming. Students will be introduced to two axis CNC lathe programming and three axis CNC milling machine programming. Develops the theory of programming in the classroom with applications of the program accomplished on industry-type machines. Studies terminology of coordinates, cutter paths, angle cutting, and linear and circular interpolation. Classroom activities will concentrate on precision set-up and inspection work, as well as machine shop calculations. Students will develop skills in advanced machining and measuring parts involving tighter tolerances and more complex geometry. Throughout the course there will be a continued focus on workplace safety.

- Recommended Grade(s): 11, 12
- Required Prerequisites: Principles of Precision Machining; Precision Machining Fundamentals
- Required Corequisites: Advanced Precision Machining
- Counts as a Directed Elective or Elective for all diplomas
- Counts as a quantitative reasoning course

## ***Welding Technology***

### **PRINCIPLES OF WELDING TECHNOLOGY (DUAL CREDIT) - 7110**

2 CREDITS (1 PER SEMESTER)

Principles of Welding Technology includes classroom and laboratory experiences that develop a variety of skills in oxy-fuel cutting and basic welding. This course is designed for individuals who intend to make a career as a Welder, Technician, Designer, Researcher, or Engineer. Emphasis is placed on safety at all times. OSHA standards and guidelines endorsed by the American Welding Society (AWS) are used. Instructional activities emphasize properties of metals, safety issues, blueprint reading, electrical principles, welding symbols, and mechanical drawing through projects and exercises that teach students how to weld and be prepared for postsecondary and career success.

- Recommended Grade: 10, 11
- Recommended Prerequisites: Introduction to Advanced Manufacturing
- Required Corequisites: Shielded Metal Arc Welding
- Counts as a directed elective or elective for all diplomas

### **SHIELDED METAL ARC WELDING (DUAL CREDIT) - 7111**

2 CREDITS (1 PER SEMESTER)

This course involves the theory and application of the Shielded Metal Arc Welding process. Process theory will include basic electricity, power sources, electrode selection, and all aspects pertaining to equipment operation and maintenance. Laboratory welds will be performed in basic weld joints with a variety of electrodes in the flat, horizontal and vertical positions. Emphasis will be placed on developing the basic skills necessary to comply with AWS industry standards.

- Recommended Grade: 10, 11
- Required Corequisites: Principles of Welding Technology
- Counts as a directed elective or elective for all diplomas

### **GAS WELDING PROCESSES - 7101**

2 CREDITS (1 PER SEMESTER)

Gas Welding Processes is designed to cover the operation of Gas Metal Arc Welding (MIG) equipment. This will include all settings, adjustments and maintenance needed to weld with a wire feed system. Instruction on both short-arc and spray- arc transfer methods will be covered. Tee, lap, and open groove joints will be done in all positions with solid, fluxcore, and aluminum wire. Test plates will be made for progress evaluation. Schools may choose to offer the course as a comprehensive MIG Welding course or a combination of introductory MIG and TIG Welding operations.

- Recommended Grade(s): 11, 12
- Required Prerequisites: Principles of Welding Technology; Shielded Metal Arc Welding
- Required Corequisites: Welding Technology Capstone

- Counts as a directed elective or elective for all diplomas

### **WELDING TECHNOLOGY CAPSTONE - 7226**

2 CREDITS (1 PER SEMESTER)

The Welding Technology Capstone course builds upon the knowledge and skills developed in Welding Fundamentals, Shielded Metal Arc Welding, and Gas Metal Arc Welding by developing advanced welding skills in Gas Tungsten Arc Welding (TIG), Pipe Welding, and Fabrication. As a capstone course, students should have the opportunity to apply their knowledge and use skills through an intensive work-based learning experience.

- Recommended Grade(s): 11, 12
- Required Prerequisites: Principles of Welding Technology; Shielded Metal Arc Welding
- Required Corequisites: Gas Welding Processes
- Counts as a Directed Elective or Elective for all diplomas

## **AGRICULTURE, FOOD AND NATURAL RESOURCES**

### ***Agriscience – Plants or Animals***

#### **PRINCIPLES OF AGRICULTURE (DUAL CREDIT) - 7117**

2 CREDITS (1 PER SEMESTER)

Principles of Agriculture is a two-semester course that will cover the diversity of the agricultural industry and agribusiness concepts. Students will develop an understanding and the role of agriculture in the United States and globally. Topics covered in the course range from animals, plants, food, natural resources, ag power, structures and technology, as well as careers.

- Recommended Grade: 9, 10, 11
- Counts as a directed elective or elective credits for all diplomas

#### **ANIMAL SCIENCE (DUAL CREDIT) - 5008**

2 CREDITS (1 PER SEMESTER)

Animal Science provides students with an overview of the field of animal science. Students participate in a large variety of activities and laboratory work including real and simulated animal science experiences and projects. All areas that the students study can be applied to both large and small animals. Topics to be addressed include: anatomy and physiology, genetics, reproduction, nutrition, common diseases and parasites, social and political issues related to the industry and management practices for the care and maintenance of animals while incorporating leadership development, supervised agricultural experience and learning about career opportunities in the area of animal science.

- Grade Level: 10, 11, 12
- Recommended Prerequisites: Principles of Agriculture
- Fulfills a science course requirement for all diplomas
- Fulfills a Life Science or Physical Science requirement for the General Diploma only
- Counts as a Directed Elective or Elective for all diplomas

#### **PLANT AND SOIL SCIENCE (DUAL CREDIT) - 5170**

2 CREDITS (1 PER SEMESTER)

Plant and Soil Science provides students with opportunities to participate in a variety of activities which includes laboratory work. The following topics are found in this course: plant taxonomy, components and their functions; plant growth, reproduction and propagation; photosynthesis and respiration; environmental factors affecting plant growth, management of plant diseases and pests; biotechnology; the basic components and types of soil; calculation of fertilizer application rates and procedures for application; soil tillage and conservation; irrigation and drainage; land measurement, cropping systems, precision agriculture, principles and benefits of global positioning systems; and harvesting. Leadership development, supervised agricultural experience and career exploration opportunities in the field of plant and soil science are also included.

- Grade Level: Grade 10, 11, 12
- Recommended Prerequisites: Principles of Agriculture
- Fulfills a science course requirement for all diplomas
- Fulfills a Life Science or Physical Science requirement for the General Diploma only
- Counts as a Directed Elective or Elective for all diplomas

#### **FOOD SCIENCE (DUAL CREDIT) - 5102**

2 CREDITS (1 PER SEMESTER)

Food Science provides students with an overview of food science and its importance. Introduction to principles of food processing, food chemistry and physics, nutrition, food microbiology, preservation, packaging and labeling, food commodities, food regulations, issues and careers in the food science industry help students understand the role that food science plays in securing a safe, nutritious and adequate food supply. A project-based approach is utilized along with laboratory, team building and problem solving activities to enhance student learning, leadership development, supervised agricultural experience and career opportunities in the area of food science.

- Grade Level: 10, 11, 12
- Prerequisites: Principles of Agriculture
- Fulfills a Life Science or Physical Science requirement for the General Diploma only
- Counts as a Directed Elective or Elective for all diplomas

#### **ADVANCED LIFE SCIENCE: ANIMALS (DUAL CREDIT) - 5070**

2 CREDITS (1 PER SEMESTER)

Advanced Life Science: Animals provides students with opportunities to participate in a variety of activities including laboratory work. Students investigate concepts that enable them to understand animal life and animal science as it pertains to agriculture. Through instruction, including laboratory, fieldwork, leadership development, supervised agricultural experience and the exploration of career opportunities, they will recognize concepts associated with animal taxonomy, life at the cellular level, organ systems, genetics, evolution, and ecology, historical and current issues in animal agriculture in the area of advanced life science in animals.

- Grade Level: 11, 12
- Required Prerequisites: Animal Science
- Fulfills a Core 40 Science requirement for all diplomas
- Counts as an Elective or Directed Elective for all diplomas
- Qualifies as a quantitative reasoning course

#### **ADVANCED LIFE SCIENCE: PLANTS AND SOILS - 5074**

2 CREDITS (1 PER SEMESTER)

Advanced Life Science: Plants and Soils is a two-semester course that provides students with opportunities to participate in a variety of activities including laboratory work. Students study concepts, principles, and theories associated with plants and soils. Knowledge gained enables them to better understand the workings of agricultural and horticultural practices.

They recognize how plants are classified, grow, function, and reproduce. Students explore plant genetics and the use of plants by humans. They examine plant evolution and the role of plants in ecology. Students investigate, through laboratories and fieldwork, how plants function and how soil influences plant life.

- Recommended Grade: 11, 12
- Required Prerequisites: Plant and Soil Science
- Fulfills a Core 40 Science requirement for all diplomas
- Counts as an Elective or Directed Elective for all diplomas
- Qualifies as a quantitative reasoning course

#### **ADVANCED LIFE SCIENCE: FOODS (DUAL CREDIT) - 5072**

2 CREDITS (1 PER SEMESTER)

Advanced Life Science: Foods is a course that provides students with opportunities to participate in a variety of activities including laboratory work. This is a standards-based, interdisciplinary science course that integrates biology, chemistry, and microbiology in the context of foods and the global food industry. Students enrolled in this course formulate, design, and carry out food-base laboratory and field investigations as an essential course component. Students understand how biology, chemistry, and physics principles apply to the composition of foods, the nutrition of foods, food and food product development, food processing, food safety and sanitation, food packaging, and food storage. Students completing this course will be able to apply the principles of scientific inquiry to solve problems related to biology, physics, and chemistry in the context of highly advanced industry applications of foods.

- Recommended Grade: 11, 12
- Recommended Prerequisites: Food Science
- Fulfills a Core 40 Science requirement for all diplomas
- Qualifies as a quantitative reasoning course

### ***Landscaping***

#### **PRINCIPLES OF AGRICULTURE (DUAL CREDIT) - 7117**

*COURSE CODE: 7117*



## 2 CREDITS (1 PER SEMESTER)

Principles of Agriculture is a two-semester course that will cover the diversity of the agricultural industry and agribusiness concepts. Students will develop an understanding and the role of agriculture in the United States and globally. Topics covered in the course range from animals, plants, food, natural resources, ag power, structures and technology, as well as careers.

- Recommended Grade: 9, 10, 11
- Recommended Prerequisites: none
- Counts as a directed elective or elective credits for all diplomas

### **HORTICULTURAL SCIENCE (DUAL CREDIT) - 5132**

#### 2 CREDITS (1 PER SEMESTER)

Horticulture Science is designed to give students a background in the field of horticulture and its many career opportunities. It addresses the biology and technology involved in the production, processing and marketing of plants and its products. Topics covered include: reproduction and propagation of plants, plant growth, growth media, management practices for field and greenhouse production, marketing concepts, production of plants of local interest and pest management. Students participate in a variety of activities to include extensive laboratory work usually in a school greenhouse, leadership development, supervised agricultural experience and learning about career opportunities in the area of horticulture science.

- Grade Level: 10-12
- Prerequisites: Principles of Agriculture
- Fulfills a Life Science or Physical Science requirement for the General Diploma only
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas
- ***Students must meet Ivy Tech Testing Requirements for PSAT, SAT, ACT or Accuplacer to receive dual credit (see counselor for details)***

### **LANDSCAPE AND TURF MANAGEMENT - 7115**

#### 2 CREDITS (1 PER SEMESTER)

Landscape and Turf Management is a two-semester course that provides the student with an overview of the many career opportunities in the diverse field of landscape and turf management. Students are introduced to the procedures used in the planning and design of a landscape using current technology practices, the principles and procedures involved with landscape construction, the determination of maintenance schedules, communications, and management skills necessary in landscaping operations, and the care and use of equipment utilized by landscapers. Upon completion of the program, students have the opportunity to become Indiana Landscape Industry Certified through a state approved program.

- Recommended Grade(s): 10, 11, 12
- Required Prerequisites: Principles of Agriculture
- Counts as a directed elective or elective credits for all diplomas

## ***Veterinary Science (C4 Program)***

### **PRINCIPLES OF VETERINARY SCIENCE (C4 Program) - 7280**

#### 2 CREDITS (1 PER SEMESTER)

Principles of Veterinary Science provides students with an overview of the small and large animal veterinary industry which includes companion, food, and exotic animals. Principles of Veterinary Science provides students with an overview of common veterinary careers, including: veterinary assistant, veterinary technician, and veterinarian. Students will learn the foundational knowledge necessary for a career working with either large or small animals. Students will also begin developing practical lab skills and an understanding of common veterinary office practices.

- Recommended Grade: 11
- Required Prerequisites: None
- Counts as a directed elective or elective for all diplomas
- ***Note: This is a C4 program held at Columbus East High School. Transportation is provided by SHS.***

### **VETERINARY SCIENCE (C4 Program) - 7281**

#### 2 CREDITS (1 PER SEMESTER)

Veterinary Science provides students with opportunities to participate in a variety of activities including laboratory work. Students will explore concepts including: medical terminology, laboratory procedures, clinical examination procedures, and the principles of animal diseases. Students will be introduced to issues associated with working in a veterinary clinic, veterinary clinic management, and veterinary law and ethics.

- Recommended Grade: 11
- Required Prerequisites: Principles of Veterinary Science
- Counts as a directed elective or elective for all diplomas
- **Note: This is a C4 program held at Columbus East High School. Transportation is provided by SHS.**

#### **ADVANCED LIFE SCIENCE: ANIMALS (C4 Program) - 5070**

2 CREDITS (1 PER SEMESTER)

Advanced Life Science: Animals provides students with opportunities to participate in a variety of activities including laboratory work. Students investigate concepts that enable them to understand animal life and animal science as it pertains to agriculture. Through instruction, including laboratory, fieldwork, leadership development, supervised agricultural experience and the exploration of career opportunities, they will recognize concepts associated with animal taxonomy, life at the cellular level, organ systems, genetics, evolution, and ecology, historical and current issues in animal agriculture in the area of advanced life science in animals.

- Grade Level: 12
- Required Prerequisites: Principles of Agriculture or Principles of Veterinary Science
- Recommended Prerequisites: Animal Science, Chemistry or ICP
- Fulfills a science requirement for all diplomas
- Qualifies as a quantitative reasoning course
- Counts as an elective or directed elective for all diplomas
- **Note: This is a C4 program held at Columbus East High School. Transportation is provided by SHS.**

#### **VETERINARY SCIENCE CAPSTONE (C4 Program) - 7282**

2 CREDITS (1 PER SEMESTER)

The Veterinary Science Capstone builds upon the knowledge and skills developed in the animal and veterinary courses by developing advanced skills that students can apply to the field. As a capstone course, students should have the opportunity to apply their knowledge and use skills through an intensive work-based learning experience. Students should explore concepts related to pharmacy and pharmacology, medical math, animal nursing, radiology and ultrasound imaging, and surgical preparation and assisting.

- Recommended Grade(s): 12
- Required Prerequisites: Principles of Veterinary Science; Advanced Life Science: Animals; Veterinary Science
- Counts as a directed elective or elective for all diplomas
- **Note: This is a C4 program held at Columbus East High School. Transportation is provided by SHS.**

## **ARCHITECTURE AND CONSTRUCTION**

### ***Construction Trades: Carpentry***

#### **PRINCIPLES OF CONSTRUCTION TRADES - 7130**

2 CREDITS (1 PER SEMESTER)

Principles of Construction Trades provides students with the basic skills needed to continue in a construction trade field. Covered topics include an introduction to the types and uses for common hand and power tools, learning the types and basic terminology associated with construction drawings, and basic worksite safety. Additionally, students study the roles of individuals and companies within the construction industry. Emphasis is placed on the importance of mathematical and communication skills within the construction industry.

- Recommended Grade: 9, 10, 11
- Counts as a directed elective or elective for all diplomas

#### **CONSTRUCTION TRADES: GENERAL CARPENTRY - 7123**

2 CREDITS (1 PER SEMESTER)

Construction Trades: General Carpentry builds upon the skills learned in the Principles of Construction Trades and examines the basics of framing. Students learn the procedures for laying out and constructing floor systems, wall systems, and ceiling joists. Students also spend time learning the principles of roof framing, and basic stair layout. Additionally, students will be introduced to building envelope systems.

- Recommended Grade(s): 10, 11, 12
- Required Prerequisites: Principles of Construction Trades
- Taken concurrently with Construction Trades: Framing and Finishing

- Counts as a directed elective or elective for all diplomas

### **CONSTRUCTION TRADES: FRAMING AND FINISHING - 7122**

2 CREDITS (1 PER SEMESTER)

Construction Trades: Framing and Finishing prepares students with advanced framing skills along with interior and exterior finishing techniques. Covered topics include roofing applications, thermal and moisture protection, exterior finishing, cold-formed steel framing, drywall installation and finishing, doors and door hardware, suspended ceilings, window, door, floor, and ceiling trim, and cabinet installation.

- Recommended Grade(s): 10, 11, 12
- Required Prerequisites: Principles of Construction Trades
- Taken concurrently with Construction Trades: General Carpentry
- Counts as a directed elective or elective for all diplomas

### **CONSTRUCTION TRADES CAPSTONE - 7242**

4 CREDITS (2 PER SEMESTER)

The Construction Trades Capstone covers the basics of electricity and working with concrete. Electrical topics include the National Electric Code, electrical safety, electrical circuits, basic electrical construction drawings, and residential electrical services. Students may also gain an understanding of concrete properties, foundations, slab-on-grades, and vertical and horizontal formwork.

- Recommended Grade(s): 11, 12
- Required Prerequisites: Principles of Construction Trades; Construction Trades: General Carpentry; and Construction Trades: Framing and Finishing
- Counts as a directed elective or elective for all diplomas
- Counts as a quantitative reasoning course

## **ARTS, AV TECH & COMMUNICATION**

### ***Digital Design (C4 Program)***

#### **PRINCIPLES OF DIGITAL DESIGN - 7140**

2 CREDITS (1 PER SEMESTER)

Principles of Digital Design introduces students to fundamental design theory. Investigations into design theory and color dynamics will provide experiences in applying design theory, ideas and creative problem solving, critical peer evaluation, and presentation skills. Students will have the opportunity to apply the design theory through an understanding of basic photographic theory and technique. Topics will include image capture, processing, various output methods, and light.

- Recommended Grade(s): 9, 10, 11
- Required Prerequisites: None
- Recommended Prerequisites: None
- 2 semester course, 2 semesters required, 1 credit per semester, 2 credits maximum
- Counts as a directed elective or elective for all diplomas
- **Note: This is a C4 program held at Columbus North High School. Transportation is provided by SHS. Students must be on track towards graduation to be eligible to participate.**

#### **DIGITAL DESIGN GRAPHICS - 7141**

2 CREDITS (1 PER SEMESTER)

Digital Design Graphics will help students to understand and create the most common types of computer graphics used in visual communications. Skills are developed through work with professional vector-based and page layout software used in the industry. Additionally, students will be introduced to a full range of image input technology and manipulation including conventional photography, digital imaging, and computer scanners. Students will learn to communicate concepts and ideas through various imaging devices.

- Recommended Grade(s): 11
- Required Prerequisites: Principles of Digital Design
- Counts as a directed elective or elective for all diplomas
- **Note: This is a C4 program held at Columbus North High School. Transportation is provided by SHS. Students must be on track towards graduation to be eligible to participate.**

### **INTERACTIVE MEDIA DESIGN - 7138**

2 CREDITS (1 PER SEMESTER)

Interactive Media Design focuses on the tools, strategies, and techniques for interactive design and emerging technologies, like web and social media. Students will learn the basics of planning, shooting, editing and post-producing video and sound. Additionally, students will explore the process of integrating text, graphics, audio and video for effective communication of information.

- Recommended Grade(s): 12
- Required Prerequisites: Principles of Digital Design; Digital Design Graphics
- Counts as a directed elective or elective for all diplomas
- **Note: This is a C4 program held at Columbus North High School. Transportation is provided by SHS. Students must be on track towards graduation to be eligible to participate.**

### **GRAPHIC DESIGN AND LAYOUT - 5550**

2 CREDITS (1 PER SEMESTER)

Graphic Design and Layout teaches design process and the proper and creative use of type as a means to develop effective communications for global, corporate and social application. Students will create samples for a portfolio, which may include elements or comprehensive projects in logo, stationery, posters, newspaper, magazine, billboard, and interface design.

- Recommended Grade(s): 12
- Required Prerequisites: Principles of Digital Design; Digital Design Graphics
- Counts as a directed elective or elective for all diplomas
- **Note: This is a C4 program held at Columbus North High School. Transportation is provided by SHS. Students must be on track towards graduation to be eligible to participate.**

### **DIGITAL DESIGN CAPSTONE - 7246**

2 CREDITS (1 PER SEMESTER)

The Digital Design Capstone course provides students the opportunity to dive deeper into advanced concepts of Visual Communication including user experience/user interface design, video production editing, animation and/or web design. Depending on the length of the course, students may focus their efforts on one area or explore multiple aspects.

- Recommended Grade: 12
- Required Prerequisites: Digital Design Concentrator Sequence
- Counts as a Directed Elective or Elective for all diplomas
- **Note: This is a C4 program held at Columbus North High School. Transportation is provided by SHS. Students must be on track towards graduation to be eligible to participate.**

## ***Fashion Textiles and Design***

### **PRINCIPLES OF FASHION AND TEXTILES - 7301**

2 CREDITS (1 PER SEMESTER)

Principles of Fashion and Textiles prepares students for occupations and higher education programs of study related to the entire spectrum of careers in the fashion industry. This course builds a foundation that prepares students for all aspects of the fashion creation process. Major topics include: Basic clothing construction techniques, pattern alterations, and use of commercial patterns.

- Recommended Grade(s): 9, 10
- Counts as a Directed Elective or Elective for all diplomas

### **TEXTILES, APPAREL, AND MERCHANDISING - 7302**

2 CREDITS (1 PER SEMESTER)

Textiles, Apparel, and Merchandising provides a comprehensive overview of the textiles, apparel and merchandising industry specific to fashion related goods including the nature of fashion, raw materials and production, designers, retailers, and supporting services.

- Recommended Grade(s): 10, 11, 12
- Required Prerequisites: Principles of Fashion and Textiles
- Counts as a Directed Elective or Elective for all diplomas

### **ADVANCED TEXTILES - 7303**

2 CREDITS (1 PER SEMESTER)

Advanced Textiles will focus on the study of textiles concerning fiber, yarn, fabric construction, and finishes which affect the selection, use, and care of textiles.

- Recommended Grade(s): 11, 12
- Required Prerequisites: Principles of Fashion and Textiles; Textiles, Apparel, and Merchandising
- Counts as a Directed Elective or Elective for all diplomas

### ***Radio and Television Broadcasting (C4 PROGRAM)***

#### **PRINCIPLES OF BROADCASTING - 7139**

2 CREDITS (1 PER SEMESTER)

The purpose of the Principles of Broadcasting course is to provide entry-level fundamental skills for students who wish to seek or pursue opportunities in the field of broadcasting or mass media. Students will explore the technical aspects of audio and sound design for radio production and distribution, as well as, the technical aspects of video production and distribution.

- Recommended Grade: 11
- Required Corequisites: Audio and Video Production Essentials
- Counts as a directed elective or elective for all diplomas
- ***Note: This is a C4 program held at Columbus East High School. Transportation is provided by SHS. Students must be on track towards graduation to be eligible to participate.***

#### **AUDIO AND VIDEO PRODUCTION ESSENTIALS - 7306**

2 CREDITS (1 PER SEMESTER)

Audio and Video Production Essentials provides an in-depth study on audio and video production techniques for radio, television, and digital technologies. Students will learn skills necessary for audio production and on-air work used in radio and other digital formats. Additionally, experience will be gained in the development of the video production process; including skills in message development, directing, camera, video switcher, and character generator operations.

- Recommended Grade: 11
- Required Corequisites: Principles of Broadcasting
- Counts as a Directed Elective or Elective for all diplomas
- ***Note: This is a C4 program held at Columbus East High School. Transportation is provided by SHS. Students must be on track towards graduation to be eligible to participate.***

#### **MASS MEDIA PRODUCTION - 7307**

2 CREDITS (1 PER SEMESTER)

Audio and Video Production Essentials provides an in-depth study on audio and video production techniques for radio, television, and digital technologies. Students will learn skills necessary for audio production and on-air work used in radio and other digital formats. Additionally, experience will be gained in the development of the video production process; including skills in message development, directing, camera, video switcher, and character generator operations.

- Recommended Grade: 12
- Required Prerequisites: Principles of Broadcasting, Audio and Video Production Essentials
- Required Corequisites: Radio & TV Broadcasting Capstone
- Counts as a Directed Elective or Elective for all diplomas
- ***Note: This is a C4 program held at Columbus East High School. Transportation is provided by SHS. Students must be on track towards graduation to be eligible to participate***

#### **RADIO & TV BROADCASTING CAPSTONE - 7308**

2 CREDITS (1 PER SEMESTER)

This course will cover a variety of domains further building on skills in video production, and broadcast industry practices specific to radio, television, and digital media. Attention will be given to cross-industry synergies, emerging technologies, and the global market for media. Students are highly encouraged to do a video newscast or radio practicum to gain real world experience. In most cases this practicum may be completed through a school-based enterprise.

- Recommended Grade: 12
- Required Prerequisites: Principles of Broadcasting; Audio and Video Production Essentials
- Required Corequisites: Mass Media Production
- Counts as a Directed Elective or Elective for all diplomas
- ***Note: This is a C4 program held at Columbus East High School. Transportation is provided by SHS. Students must be on track towards graduation to be eligible to participate***

## **FINANCE**

### ***Finance and Investment***

#### **PRINCIPLES OF BUSINESS MANAGEMENT (DUAL CREDIT) - 4562**

2 CREDITS (1 PER SEMESTER)

Principles of Business Management examines business ownership, organization principles and problems, management, control facilities, administration, financial management, and development practices of business enterprises. This course will also emphasize the identification and practice of the appropriate use of technology to communicate and solve business problems and aid in decision making. Attention will be given to developing business communication, problem-solving, and decision-making skills using spreadsheets, word processing, data management, and presentation software.

- Recommended Grade(s): 9, 10
- Counts as a directed elective or elective for all diplomas

#### **ACCOUNTING FUNDAMENTALS - 4524**

2 CREDITS (1 PER SEMESTER)

Accounting Fundamentals introduces the language of business using Generally Accepted Accounting Principles (GAAP) and procedures for proprietorships and partnerships using double-entry accounting. Emphasis is placed on accounting principles as they relate to both manual and automated financial systems. This course involves understanding, analyzing, and recording business transactions and preparing, analyzing, and interpreting financial reports as a basis for decision-making.

- Recommended Grade(s): 10, 11, 12
- Required Prerequisites: Principles of Business Management
- Counts as a directed elective or elective all diplomas

#### **FINANCE AND INVESTMENT - 5258**

2 CREDITS (1 PER SEMESTER)

Finance and Investments addresses the need of schools in areas that have workforce demand in the finance industry. It analyzes and synthesizes high-level skills needed for a multitude of careers in the banking and investment industry. Students learn banking, investments, and other finance fundamentals and applications related to financial institutions, business and personal financial services, investment and securities, risk management products, and corporate finance.

- Recommended Grade(s): 11, 12
- Required Prerequisites: Principles of Business Management; Accounting Fundamentals
- Counts as a directed elective or elective for all diplomas
- Counts as a quantitative reasoning course

## **MARKETING**

### ***Entrepreneurship***

#### **PRINCIPLES OF ENTREPRENEURSHIP - 7154**

2 CREDITS (1 PER SEMESTER)

Principles of Entrepreneurship focuses on students learning about their own strengths, character and skills and how their unique abilities can apply to entrepreneurship, as well as how an entrepreneurial mindset can serve them regardless of their career path. Students will learn about the local, regional and state resources and will begin to understand and apply the entrepreneurial process. The course helps students to identify and evaluate business ideas while learning the steps and competencies required to launch a successful new venture. The course helps students apply what they have learned from the content when they write a Personal Vision Statement, a Business Concept Statement, and an Elevator Pitch.

- Recommended Grade(s): 9, 10, 11
- Required Corequisites: New Venture Development
- Counts as a directed elective or elective for all diplomas

#### **NEW VENTURE DEVELOPMENT - 7148**

2 CREDITS (1 PER SEMESTER)

New Venture Development is targeted to students interested in creating and growing their own businesses. The course will focus on key marketing strategies particularly relevant for new ventures. Students will apply marketing concepts to

entrepreneurial company challenges, which include creating and nurturing relationships with new customers, suppliers, distributors, employees and investors; and understand the special challenges and opportunities involved in developing marketing strategies "from the ground up."

- Recommended Grade(s): 9, 10, 11
- Required Corequisites: Principles of Entrepreneurship
- Counts as a directed elective or elective for all diplomas

### **SMALL BUSINESS OPERATION - 7147**

2 CREDITS (1 PER SEMESTER)

Small Business Operations will help students identify and evaluate the various sources available for funding a new enterprise; demonstrate an understanding of financial terminology; read, prepare, and analyze basic financial statements; estimating capital requirements and risk, exit strategies; and prepare a budget for their business, including taxes and personnel costs. In addition, the student should be able to explain the importance of working capital and cash management. The student should also be able to identify financing needs, and prepare sales forecasts.

- Recommended Grade(s): 10, 11, 12
- Required Prerequisites: Principles of Entrepreneurship; New Venture Development
- Required Corequisites: Business Management Capstone
- Counts as a directed elective or elective for all diplomas

### **BUSINESS MANAGEMENT CAPSTONE - 7201**

2 CREDITS (1 PER SEMESTER)

The Business Management Capstone is designed to provide any student with the Business Management skills necessary to run their own business or to serve in upper-level management. Students will explore Management Theory, Accounting, and Business Law. The Business Management Capstone can be used with any career pathway except Business Administration.

- Recommended Grade(s): 11, 12
- Required Prerequisites: Principles of Entrepreneurship, New Venture Development
- Required Corequisites: Small Business Operation
- Counts as a Directed Elective or Elective for all diplomas

## ***Marketing and Sales***

### **PRINCIPLES OF BUSINESS MANAGEMENT (DUAL CREDIT) - 4562**

2 CREDITS (1 PER SEMESTER)

Principles of Business Management examines business ownership, organization principles and problems, management, control facilities, administration, financial management, and development practices of business enterprises. This course will also emphasize the identification and practice of the appropriate use of technology to communicate and solve business problems and aid in decision making. Attention will be given to developing business communication, problem-solving, and decision-making skills using spreadsheets, word processing, data management, and presentation software.

- Recommended Grade(s): 9, 10
- Counts as a directed elective or elective for all diplomas

### **MARKETING FUNDAMENTALS - 5914**

2 CREDITS (1 PER SEMESTER)

Marketing Fundamentals provides a basic introduction to the scope and importance of marketing in the global economy. Course topics include the seven functions of marketing: promotion, channel management, pricing, product/service management, market planning, marketing information management, and professional selling skills. Emphasis is marketing content but will involve use of oral and written communications, mathematical applications, problem-solving, and critical thinking skills through the development of an integrated marketing plan and other projects.

- Recommended Grade(s): 10, 11
- Required Prerequisites: Principles of Business Management
- Counts as a directed elective or elective all diplomas

### **DIGITAL MARKETING - 7145**

2 CREDITS (1 PER SEMESTER)

Digital Marketing provides an introduction to the world of e-commerce and digital marketing media. The course covers how to integrate digital media and e-commerce into organizational and marketing strategy. Students will explore e-commerce

applications and the most popular digital marketing tactics and tools. Emphasizes familiarity with executing digital media, understanding the marketing objectives that digital media can help organizations achieve, and establishing and enhancing an organization's digital marketing presence.

- Recommended Grade(s): 11, 12
- Required Prerequisites: Principles of Business Management; Marketing Fundamentals
- Counts as a directed elective or elective for all diplomas.

## **BUSINESS MANAGEMENT AND ADMINISTRATION**

### ***Business Administration***

#### **PRINCIPLES OF BUSINESS MANAGEMENT (DUAL CREDIT) - 4562**

2 CREDITS (1 PER SEMESTER)

Principles of Business Management examines business ownership, organization principles and problems, management, control facilities, administration, financial management, and development practices of business enterprises. This course will also emphasize the identification and practice of the appropriate use of technology to communicate and solve business problems and aid in decision making. Attention will be given to developing business communication, problem-solving, and decision-making skills using spreadsheets, word processing, data management, and presentation software.

- Recommended Grade(s): 9, 10
- Counts as a directed elective or elective for all diplomas
- ***Students must meet Ivy Tech Testing Requirements for PSAT, SAT, ACT or Ivy Tech's Knowledge Assessment to receive dual credit (see counselor for details)***

#### **MARKETING FUNDAMENTALS - 5914**

2 CREDITS (1 PER SEMESTER)

Marketing Fundamentals provides a basic introduction to the scope and importance of marketing in the global economy. Course topics include the seven functions of marketing: promotion, channel management, pricing, product/service management, market planning, marketing information management, and professional selling skills. Emphasis is marketing content but will involve use of oral and written communications, mathematical applications, problem-solving, and critical thinking skills through the development of an integrated marketing plan and other projects.

- Recommended Grade(s): 10, 11
- Required Prerequisites: Principles of Business Management
- Counts as a directed elective or elective all diplomas
- ***Students must meet Ivy Tech Testing Requirements for PSAT, SAT, ACT or Ivy Tech's Knowledge Assessment to receive dual credit (see counselor for details)***

#### **ACCOUNTING FUNDAMENTALS (DUAL CREDIT) - 4524**

2 CREDITS (1 PER SEMESTER)

Accounting Fundamentals introduces the language of business using Generally Accepted Accounting Principles (GAAP) and procedures for proprietorships and partnerships using double-entry accounting. Emphasis is placed on accounting principles as they relate to both manual and automated financial systems. This course involves understanding, analyzing, and recording business transactions and preparing, analyzing, and interpreting financial reports as a basis for decision-making.

- Recommended Grade(s): 10, 11, 12
- Required Prerequisites: Principles of Business Management
- Counts as a directed elective or elective all diplomas
- ***Students must meet Ivy Tech Testing Requirements for PSAT, SAT, ACT or Ivy Tech's Knowledge Assessment to receive dual credit (see counselor for details)***

## **EDUCATION AND TRAINING**

### ***Early Childhood***

#### **PRINCIPLES OF EARLY CHILDHOOD EDUCATION - 7160**



## 2 CREDITS (1 PER SEMESTER)

This course provides students with an overview of skills and strategies necessary to successfully complete a certificate. Additionally, it provides an overview of the history, theory, and foundations of early childhood education as well as exposure to types of programs, curricula and services available to young children. This course also examines basic principles of child development, Developmentally Appropriate Practices (DAP), importance of family, licensing, and elements of quality care of young children with an emphasis on the learning environment related to health, safety, and nutrition. Students may be required to complete observations and field experiences with children as part of this course.

- Recommended Grade(s): 9, 10
- Counts as a directed elective or elective for all diplomas

## **EARLY CHILDHOOD EDUCATION CURRICULUM - 7158**

### 2 CREDITS (1 PER SEMESTER)

Early Childhood Education Curriculum examines developmentally appropriate environments and activities in various childcare settings while exploring the varying developmental levels and cultural backgrounds of children. Students may be required to complete observations and field experiences with children as part of this course.

- Recommended Grade(s): 10, 11
- Required Prerequisites: Principles of Early Childhood Education
- Counts as a directed elective or elective for all diplomas

## **EARLY CHILDHOOD EDUCATION GUIDANCE - 7159**

*Course Code: 7159*

### 2 CREDITS (1 PER SEMESTER)

This course allows students to analyze developmentally appropriate guidance, theory and implementation for various early care and education settings. It also provides a basic understanding of the anti-bias/multicultural emphasis in the field of early childhood. Students may be required to complete observations and field experiences with children as part of this course.

- Recommended Grade(s): 11, 12
- Required Prerequisites: Principles of Early Childhood Education, Early Childhood Education Curriculum
- Counts as a directed elective or elective for all diplomas

## ***Education Careers***

## **PRINCIPLES OF TEACHING - 7161**

### 2 CREDITS (1 PER SEMESTER)

This course provides a general introduction to the field of teaching. Students will explore educational careers, teaching preparation, and professional expectations as well as requirements for teacher certification. Current trends and issues in education will be examined. A minimum 20 hour classroom observation experience is required for successful completion of this course.

- Recommended Grade(s): 9, 10
- Counts as a directed elective or elective for all diplomas

## **CHILD AND ADOLESCENT DEVELOPMENT - 7157**

### 2 CREDITS (1 PER SEMESTER)

Child and Adolescent Development examines the physical, social, emotional, cognitive, and moral development of the child from birth through adolescence with a focus on the middle years through adolescence. Basic theories of child development, biological and environmental foundations of development, and the study of children through observation and interviewing techniques are explored. The influence of parents, peers, the school environment, culture, and the media are discussed. An observation experience up to 20 hours may be required for completion of this course. This course has been approved to be offered for dual credit. Students pursuing this course for dual credit are still required to meet the minimum prerequisites for the course and pass the course with a C or better in order for dual credit to be awarded.

- Recommended Grade(s): 10, 11
- Required Prerequisites: Principles of Teaching
- Counts as a directed elective or elective for all diplomas

## **TEACHING AND LEARNING - 7162**

### 2 CREDITS (1 PER SEMESTER)

Teaching and Learning provides students the opportunity to apply many of the concepts that they have learned throughout

the Education Professions pathway. In addition to a focus on best practices, this course will provide an introduction to the role that technology plays in the modern classroom. Through hands-on experience with educational software, utility packages, and commonly used microcomputer hardware, students will analyze ways to integrate technology as a tool for instruction, evaluation, and management.

- Recommended Grade(s): 11, 12
- Required Prerequisites: Principles of Teaching, Child and Adolescent Development
- Counts as a directed elective or elective for all diplomas

## HEALTH SCIENCES

### ***Dental Careers (C4 Program)***

#### **PRINCIPLES OF DENTAL CAREERS - 7315**

2 CREDITS (1 PER SEMESTER)

Principles of Dental Careers will provide the foundational knowledge and skills necessary to pursue a career in the dental field. A focus will be placed on the role of the modern dental assistant and will cover key pre-clinical procedures and beginning dental terminology.

- Recommended Grade: 11
- Counts as a Directed Elective or Elective for all diplomas
- **Note: This is a C4 program held at Columbus East High School. Transportation is provided by SHS. Students must be on track towards graduation to be eligible to participate**

#### **DENTAL CAREERS FUNDAMENTALS - 7316**

2 CREDITS (1 PER SEMESTER)

Dental Careers Fundamentals will build upon the knowledge and skills in the principles course. Students will understand and practice beginning chairside functions of the dental assistant along with a focus on the anatomy and physiology of the head, neck, and oral cavity. Students will also study tooth anatomy, physiology, and morphology. This part of the program will prepare students for the Anatomy, Morphology, and Physiology exam of the NELDA certification.

- Recommended Grade: 11
- Required Corequisites: Principles of Dental Careers
- Counts as a Directed Elective or Elective for all diplomas.
- **Note: This is a C4 program held at Columbus East High School. Transportation is provided by SHS. Students must be on track towards graduation to be eligible to participate**

#### **ADVANCED DENTAL CAREERS - 7317**

2 CREDITS (1 PER SEMESTER)

Advanced Dental Careers will build upon the knowledge and skills developed in the first two courses. Students will study more advanced chairside assisting functions along with advanced infection control techniques. Additionally, students will explore preventive dentistry practices and dental emergencies. This course will prepare students for the ICE exam of the NELDA certification.

- Recommended Grade: 12
- Required Prerequisites: Principles of Dental Careers; Dental Careers Fundamentals
- Required Corequisites: Dental Careers Capstone
- Counts as a Directed Elective or Elective for all diplomas.
- **Note: This is a C4 program held at Columbus East High School. Transportation is provided by SHS. Students must be on track towards graduation to be eligible to participate**

#### **DENTAL CAREERS CAPSTONE - 7318**

2 CREDITS (1 PER SEMESTER)

Dental Careers Capstone will provide the opportunity for increased skill development in clinical support through work-based learning experiences. Students will also prepare for Radiation, Health, and Safety which is the third and final part of the NELDA certification. The capstone course may also provide the opportunity to review and prepare for the entire NELDA certification.

- Recommended Grade: 12
- Required Prerequisites: Principles of Dental Careers; Dental Careers Fundamentals
- Required Corequisites: Advanced Dental Careers
- Counts as a Directed Elective or Elective for all diplomas
- **Note: This is a C4 program held at Columbus East High School. Transportation is provided by SHS. Students must be**

*on track towards graduation to be eligible to participate*

## ***Pre-Nursing / Healthcare Specialist***

### **PRINCIPLES OF HEALTHCARE (DUAL CREDIT) - 7168**

2 CREDITS (1 PER SEMESTER)

Principles of Healthcare content examines skills common to specific health career topics such as patient nursing care, dental care, animal care, medical laboratory, public health, and an introduction to healthcare systems. Lab experiences are organized and planned around the activities associated with the student's career objectives.

- Recommended Grade(s): 10, 11
- Counts as a directed elective or elective for all diplomas

### **MEDICAL TERMINOLOGY (DUAL CREDIT) - 5274**

2 CREDITS (1 PER SEMESTER)

Medical Terminology prepares students with language skills necessary for effective, independent use of health and medical reference materials. It includes the study of health and medical abbreviations, symbols, and Greek and Latin word part meanings, all taught within the context of body systems. This course builds skills in pronouncing, spelling, and defining new words encountered in verbal and written information in the healthcare industry. Students have the opportunity to acquire essential skills for accurate and logical communication, and interpretation of medical records. Emphasis is on forming a foundation of a medical vocabulary including; appropriate and accurate meaning, spelling, and pronunciation of medical terms, and abbreviations, signs, and symbols.

- Grade Level: 11, 12
- Recommended Prerequisites: Principles of Healthcare
- Counts as a Directed Elective or Elective for all diplomas
- ***NOTE: Students must have completed four semesters of classes with a 2.6 or higher GPA or meet the minimum PSAT/SAT/ACT or Ivy Tech Knowledge assessment scores as a prerequisite to receive dual credit (see counselor for details)***

### **HEALTHCARE SPECIALIST: CNA - 7166**

2 CREDITS (1 PER SEMESTER)

The Healthcare Specialist: CNA course prepares individuals desiring to work as nursing assistants with the knowledge, skills, and attitudes essential for providing basic care in extended care facilities, hospitals, and home health agencies under the direction of licensed nurses. The course will introduce students to the disease process and aspects of caring for a long-term care resident with dementia. Individuals who successfully complete this course are eligible to apply to sit for the Indiana State Department of Health (ISDH) certification exam for nursing assistants. This course meets the minimum standards set forth by the ISDH for Certified Nursing Assistant (CNA) training and for health care workers in long-term care facilities.

- Recommended Grade(s): 11, 12
- Required Prerequisites: Principles of Healthcare
- Counts as a directed elective or elective for all diplomas

### **HEALTHCARE SPECIALIST CAPSTONE (CNA) - 7255**

6 CREDITS (3 PER SEMESTER)

The Healthcare Specialist Capstone course will facilitate healthcare students' acquisition of additional knowledge and skills necessary to work in a variety of healthcare settings beyond a long-term care facility including hospitals, doctors' offices, and clinics. Students can accomplish this goal by completing coursework that will cover topics such as Medical Law and Ethics, Electronic Health Records, and/or Behavioral Health. Schools may offer additional healthcare certifications such as the Certified Clinical Medical Assistant (CCMA) or Phlebotomy along with the coursework or in place of the coursework.

- Recommended Grade(s): 11, 12
- Required Prerequisites: Principles of Healthcare; Medical Terminology
- Required Corequisite: Healthcare Specialist: CNA
- Recommended Prerequisites: None
- Counts as a Directed Elective or Elective for all diplomas

### **CERTIFIED CLINICAL MEDICAL ASSISTANT (CCMA)**

*Course Code: 7164*

2 CREDITS (1 PER SEMESTER)

The Certified Clinical Medical Assistant (CCMA) course will prepare students for the National Healthcare Association CCMA exam. Instruction includes taking and recording vital signs, preparing patients for examination, patient education, and assisting the physician during the exam. The collecting and preparation of laboratory specimens and basic laboratory testing will be covered. The course prepares students for the administration of medication, venipuncture, ECG, and wound care and provides a basic understanding of the clinical and administrative duties and responsibilities pertinent to medical offices. Instruction in medical correspondence and records, case histories of patients, filing, telephone procedures, appointment scheduling, receptionist duties, and processing mail is also included. Written, verbal, and nonverbal communications according to patient needs are covered as well as documentation and associated legal and ethical boundaries.

- Recommended Grade: 12
- Required Prerequisites: Principles of Healthcare; Medical Terminology
- Counts as a directed elective or elective for all diplomas
- **Note: This is a C4 program held at Columbus East High School. Transportation is provided by SHS. Students must be on track towards graduation to be eligible to participate**

### **HEALTHCARE SPECIALIST CAPSTONE (CCMA) - 7255**

2 CREDITS (1 PER SEMESTER)

The Healthcare Specialist Capstone course will facilitate healthcare students' acquisition of additional knowledge and skills necessary to work in a variety of healthcare settings beyond a long-term care facility including hospitals, doctors' offices, and clinics. Students can accomplish this goal by completing coursework that will cover topics such as Medical Law and Ethics, Electronic Health Records, and/or Behavioral Health. Schools may offer additional healthcare certifications such as the Certified Clinical Medical Assistant (CCMA) or Phlebotomy along with the coursework or in place of the coursework.

- Recommended Grade(s): 11, 12
- Required Prerequisites: Principles of Healthcare; Medical Terminology
- Required Corequisite: Healthcare Specialist: Certified Clinical Medical Assistant (CCMA)
- Counts as a Directed Elective or Elective for all diplomas
- **Note: This is a C4 program held at Columbus East High School. Transportation is provided by SHS. Students must be on track towards graduation to be eligible to participate**

## **Hospitality and Tourism**

### ***Culinary Arts – Baking and Pastry***

#### **PRINCIPLES OF CULINARY AND HOSPITALITY - 7173**

2 CREDITS (1 PER SEMESTER)

Principles of Culinary and Hospitality is designed to develop an understanding of the hospitality industry and career opportunities, and responsibilities in the food service and lodging industry. Introduces procedures for decision making which affects operation management, products, labor, and revenue. Additionally, students will learn the fundamentals of food preparation, basic principles of sanitation, service procedures, and safety practices in the food service industry including proper operation techniques for equipment.

- Recommended Grade(s): 9, 10, 11
- Counts as a directed elective or elective for all diplomas

#### **NUTRITION - 7171**

2 CREDITS (1 PER SEMESTER)

Nutrition students will learn the characteristics, functions and food sources of the major nutrient groups and how to maximize nutrient retention in food preparation and storage. Students will be made aware of nutrient needs throughout the life cycle and to apply those principles to menu planning and food preparation. This course will engage students in hands-on learning of nutritional concepts such as preparing nutrient dense meals or examining nutritional needs of student athletes.

- Recommended Grade(s): 10, 11, 12
- Required Prerequisites: Principles of Culinary and Hospitality
- Counts as a directed elective or elective for all diplomas

## **CULINARY ARTS - 7169**

2 CREDITS (1 PER SEMESTER)

Culinary Arts teaches students how to prepare the four major stocks, the five mother sauces (in addition to smaller sauces) and various soups. Additional emphasis is placed on the further development of the classical cooking methods. This course will also present the fundamentals of baking science including terminology, ingredients, weights and measures, and proper use and care of equipment. Students will produce yeast goods, pies, cakes, cookies, and quick breads.

- Recommended Grade(s): 10, 11, 12
- Required Prerequisites: Principles of Culinary and Hospitality
- Counts as a directed elective or elective for all diplomas

## **HUMAN SERVICES**

### ***COSMETOLOGY AND BARBERING (C4 PROGRAM)***

#### **PRINCIPLES OF BARBERING AND COSMETOLOGY - 7330**

2 CREDITS (1 PER SEMESTER)

Principles of Barbering and Cosmetology offers an introduction to cosmetology with emphasis on basic practical skills and theories including roller control, quick styling, shampooing, hair coloring, permanent waving, facials, manicuring, business and personal ethics, and bacteriology and sanitation. Successful completion of the course requires at least 375 Cosmetology studio hours.

- Recommended Grade: 11
- Required Corequisites: Barbering and Cosmetology Fundamentals, Advanced Cosmetology
- Counts as a Directed Elective or Elective for all diplomas
- ***\*Note: This is a C4 program held at McDowell Education Center. Students must be on track towards graduation to participate. This course requires extended hours of participation in order to meet the 1500 hours required for the Cosmetology and Barbering exams. Students attend class 12:30-5:30 pm, Monday through Friday, and must have their own transportation home from Columbus (McDowell Education Center.) Additional course fees may apply.***

#### **BARBERING AND COSMETOLOGY FUNDAMENTALS - 7331**

2 CREDITS (1 PER SEMESTER)

Barbering and Cosmetology Fundamentals COSMO FUND Barbering and Cosmetology Fundamentals focuses on the development of practical skills introduced in Principles of Barbering and Cosmetology. Clinical application and theory in the science of barbering and cosmetology are introduced. Successful completion of the course requires at least 375 Cosmetology studio hours.

- Recommended Grade(s): 11
- Required Corequisites: Principles of Barbering and Cosmetology, Advanced Cosmetology
- Counts as a Directed Elective or Elective for all diplomas
- ***\*Note: This is a C4 program held at McDowell Education Center. Students must be on track towards graduation to participate. This course requires extended hours of participation in order to meet the 1500 hours required for the Cosmetology and Barbering exams. Students attend class 12:30-5:30 pm, Monday through Friday, and must have their own transportation home from Columbus (McDowell Education Center.) Additional course fees may apply.***

#### **ADVANCED COSMETOLOGY - 7332**

2 CREDITS (1 PER SEMESTER)

Advanced Cosmetology will emphasize the development of advanced skills in styling, hair coloring, permanent waving, facials, manicuring, chemical texturizing, and hair cutting techniques. Students will also further study anatomy and physiology as it applies to hair care professions. Successful completion of the course requires at least 375 studio hours.

- Recommended Grade(s): 11
- Required Corequisites: Principles of Barbering and Cosmetology; Barbering and Cosmetology Fundamentals
- Counts as a Directed Elective or Elective for all diplomas
- ***\*Note: This is a C4 program held at McDowell Education Center. Students must be on track towards graduation to participate. This course requires extended hours of participation in order to meet the 1500 hours required for the Cosmetology and Barbering exams. Students attend class 12:30-5:30 pm, Monday through Friday, and must have their own transportation home from Columbus (McDowell Education Center.) Additional course fees may apply.***

#### **BARBERING AND COSMETOLOGY CAPSTONE - 7334**

6 CREDITS (3 PER SEMESTER)

Barbering and Cosmetology Capstone builds and improves previously developed skills with emphasis on developing individual

techniques. Professionalism, shop management, psychology in relation to barbering and cosmetology, and preparation for state board examinations are stressed. Successful completion of the course requires at least 375 studio hours.

- Recommended Grade: 12
- Required Prerequisites: Principles of Barbering and Cosmetology; Barbering and Cosmetology Fundamentals; Advanced Cosmetology
- Counts as a Directed Elective or Elective for all diplomas
- **\*Note: This is a C4 program held at McDowell Education Center. Students must be on track towards graduation to participate. This course requires extended hours of participation in order to meet the 1500 hours required for the Cosmetology and Barbering exams. Students attend class 12:30-5:30 pm, Monday through Friday, and must have their own transportation home from Columbus (McDowell Education Center.) Additional course fees may apply.**

## INFORMATION TECHNOLOGY

### **CYBERSECURITY (C4 PROGRAM)**

#### **PRINCIPLES OF COMPUTING - 7183**

2 CREDITS (1 PER SEMESTER)

Principles of Computing provides students the opportunity to explore how computers can be used in a wide variety of settings. The course will begin by exploring trends of computing and the necessary skills to implement information systems. Topics include operating systems, database technology, cybersecurity, cloud implementations and other concepts associated with applying the principles of good information management to the organization. Students will also have the opportunity to utilize basic programming skills to develop scripts designed to solve problems. Students will learn about algorithms, logic development and flowcharting.

- Recommended Grade: 11
- Required Corequisites: Cybersecurity Fundamentals
- Counts as a directed elective or elective for all diplomas
- Counts as a quantitative reasoning course
- Fulfills a science requirement for all diploma types
- **Note: This is a C4 program held at Columbus North High School. Transportation is provided by SHS. Students must be on track towards graduation to be eligible to participate.**

#### **CYBERSECURITY FUNDAMENTALS - 7179**

2 CREDITS (1 PER SEMESTER)

This course introduces fundamental networking protocols and their hierarchical relationship in the context of conceptual Information Communication Technology (ICT) frameworks. Students will learn how networked hosts and applications communicate across networks. Emphasis is placed on security throughout the entire SDLC (Systems Development Life Cycle).

- Recommended Grade: 11
- Required Corequisites: Principles of Computing
- Counts as a directed elective or elective for all diplomas
- Fulfills a science requirement for all diploma types
- **Note: This is a C4 program held at Columbus North High School. Transportation is provided by SHS. Students must be on track towards graduation to be eligible to participate.**

#### **ADVANCED CYBERSECURITY - 7178**

2 CREDITS (1 PER SEMESTER)

Students will acquire the fundamentals of information and data security and understand the vulnerability most organizations have in their security systems with an emphasis on firewalls, security plans and Virtual Private Networks (VPNs). Discussions will include data security methods, authentication, network attacks, malicious code and viruses, wireless security, e-mail and web security and disaster recovery. This course will also focus on the managerial aspects of information security and assurance. Topics covered include access control models, information security governance, and information security program assessment and metrics. Coverage on the foundational and technical components of information security is included to reinforce key concepts, such as security planning and contingencies, security policies, security management models and practices and ethics.

- Recommended Grade: 12
- Required Prerequisites: Principles of Computing; Cybersecurity Fundamentals
- Required Corequisites: Cybersecurity Capstone
- Counts as a directed elective or elective for all diplomas

- **Note: This is a C4 program held at Columbus North High School. Transportation is provided by SHS. Students must be on track towards graduation to be eligible to participate.**

### **INFORMATION TECHNOLOGY FUNDAMENTALS - 7180**

2 CREDITS (1 PER SEMESTER)

Information Technology Fundamentals provides the necessary competencies required for an entry-level Information Technology professional. Students will have the knowledge required to assemble components based on customer requirements, install, configure and maintain devices/software for end users, understand the basics of networking and security, properly and safely diagnose, resolve and document common hardware and software issues while applying troubleshooting skills. Students will also learn appropriate customer support, understand the basics of virtualization, desktop imaging, and deployment. This course should also prepare students for the CompTia A+ Certification Exam.

- Recommended Grade: 12
- Required Corequisites: Principles of Computing
- Counts as a directed elective or elective for all diplomas
- **Note: This is a C4 program held at Columbus North High School. Transportation is provided by SHS. Students must be on track towards graduation to be eligible to participate.**

## **LAW, PUBLIC SAFETY, CORRECTIONS, AND SECURITY**

### **CRIMINAL JUSTICE (C4 PROGRAM)**

#### **PRINCIPLES OF CRIMINAL JUSTICE - 7193**

2 CREDITS (1 PER SEMESTER)

Principles of Criminal Justice covers the purposes, functions, and history of the three primary parts of the criminal justice system: law enforcement, courts, and corrections. This course further explores the interrelationships and responsibilities of these three primary elements of the criminal justice system.

- Recommended Grade: 11
- Required Corequisites: Law Enforcement Fundamentals
- Counts as a directed elective or elective for all diplomas
- **Note: This is a C4 program held at Columbus East High School. Transportation is provided by SHS. Students must be on track towards graduation to be eligible to participate.**

#### **LAW ENFORCEMENTAL FUNDAMENTALS - 7191**

2 CREDITS (1 PER SEMESTER)

Law Enforcement Fundamentals critically examines the history and nature of the major theoretical perspectives in criminology and the theories found within those perspectives. Students analyze the research support for such theories and perspectives and the connections between theory and criminal justice system practice within all the major components of the criminal justice system. The course will allow students to demonstrate the application of specific theories to explain violent and non-violent criminal behavior on both the micro and macro levels of analysis. Additionally, this course will introduce fundamental law enforcement operations and organization. This includes the evolution of law enforcement at federal, state, and local levels.

- Recommended Grade(s): 11
- Required Corequisites: Principles of Criminal Justice
- Counts as a directed elective or elective for all diplomas
- **Note: This is a C4 program held at Columbus East High School. Transportation is provided by SHS. Students must be on track towards graduation to be eligible to participate.**

#### **CORRECTIONS AND CULTURAL AWARENESS - 7188**

2 CREDITS (1 PER SEMESTER)

Corrections and Cultural Awareness emphasizes the study of American criminal justice problems and systems in historical and cultural perspectives, as well as discussing social and public policy factors affecting crime. Multidisciplinary and multicultural perspectives are stressed. Additionally, this course takes a further examination of the American correctional system and the study of administration of local, state, and federal correctional agencies. The examination also includes the history and development of correctional policies and practices, criminal sentencing, jails, prisons, alternative sentencing, prisoner rights, rehabilitation, and community corrections including probation and parole. Current philosophies of corrections and the debates surrounding the roles and effectiveness of criminal sentences, institutional procedures, technological developments, and

special populations are discussed.

- Recommended Grade: 12
- Required Prerequisites: Principles of Criminal Justice; Law Enforcement Fundamentals
- Required Corequisites: Criminal Justice Capstone
- Counts as a directed elective or elective for all diplomas
- **Note: This is a C4 program held at Columbus East High School. Transportation is provided by SHS. Students must be on track towards graduation to be eligible to participate.**

### **CRIMINAL JUSTICE CAPSTONE - 7231**

2 CREDITS (1 PER SEMESTER)

The Criminal Justice Capstone course allows students to complete additional instruction to earn a postsecondary certificate and should include a work-based learning component such as job shadowing, internship, etc. once the core content is completed. Note that there may be age restrictions on work-based learning components.

- Recommended Grade: 12
- Required Prerequisites: Principles of Criminal Justice; Law Enforcement Fundamentals
- Required Corequisite: Corrections and Cultural Awareness
- 2 semester course, 2 semester required, 1-3 credits per semester, 6 credits max
- Counts as a directed elective or elective for all diplomas

## **STEM**

### ***DESIGN TECHNOLOGY (C4 PROGRAM)***

#### **INTRODUCTION TO ENGINEERING DESIGN - 4802**

2 CREDITS (1 PER SEMESTER)

Introduction to Engineering Design is a fundamental pre-engineering course where students become familiar with the engineering design process. Students work both individually and in teams to design solutions to a variety of problems using industry standard sketches and current 3D design and modeling software to represent and communicate solutions. Students apply their knowledge through hands-on projects and document their work with the use of an engineering notebook. Students begin with completing structured activities and move to solving open-ended projects and problems that require them to develop planning, documentation, communication, and other professional skills. Ethical issues related to professional practice and product development are also presented. NOTE: This course aligns with the PLTW Introduction to Engineering Design curriculum. Use of the PLTW curriculum may require additional training and membership in the PLTW network.

- Recommended Grade(s): 11
- Required Prerequisites: None
- Counts as a directed elective or elective for all diplomas
- **Note: This is a C4 program held at Columbus East High School. Transportation is provided by SHS. Students must be on track towards graduation to be eligible to participate.**

#### **MECHANICAL AND ARCHITECTURAL DESIGN - 7196**

2 CREDITS (1 PER SEMESTER)

Mechanical and Architectural Design provides students with a basic understanding of creating working drawings related to manufacturing detailing and assembly as well as a survey of Architectural design focused on the creative design of buildings. Topics include fastening devices, thread symbols and nomenclature, surface texture symbols, classes of fits, and the use of parts lists, title blocks and revision blocks. From an Architecture perspective, this course covers problems of site analysis, facilities programming, space planning, conceptual design, proper use of materials, and selection of structure and construction techniques.

- Recommended Grade(s): 11
- Required Corequisites: Introduction to Engineering Design
- Counts as a directed elective or elective for all diplomas
- **Note: This is a C4 program held at Columbus East High School. Transportation is provided by SHS. Students must be on track towards graduation to be eligible to participate.**

#### **BIM ARCHITECTURE - 7197**

2 CREDITS (1 PER SEMESTER)

BIM Architecture introduces students to Building Information Modeling (BIM) which is an intelligent 3D model-based process



that gives architecture, engineering, and construction professionals the insight and tools to better plan, design, and construct buildings. Students will deepen their skills in 3D CAD and learn to use BIM software to capture and analyze concepts and to prepare client presentations for Commercial Construction.

- Recommended Grade: 12
- Required Prerequisites: Introduction to Engineering Design, Mechanical and Architectural Design
- Required Corequisites: Architectural Design Capstone
- Counts as a directed elective or elective for all diplomas
- Counts as a quantitative reasoning course
- **Note: This is a C4 program held at Columbus East High School. Transportation is provided by SHS. Students must be on track towards graduation to be eligible to participate.**

### **ARCHITECTURAL DESIGN CAPSTONE - 7225**

2 CREDITS (1 PER SEMESTER)

The Architectural Design Capstone covers residential design and drafting. Topics include interior space planning, structural design and development of working drawings. The course provides opportunity for students to design a residence using accepted building standards and introduces various construction materials. Students will also learn advanced CAD design topics in architectural design. Completion of the entire course may also provide students the opportunity to understand basic surveying equipment and surveying techniques.

- Recommended Grade: 12
- Required Prerequisites: Introduction to Engineering Design; Mechanical and Architectural Design Fundamentals
- Required Corequisite: BIM Architecture
- Counts as a directed elective or elective for all diplomas

## **ENGINEERING**

### **INTRODUCTION TO ENGINEERING DESIGN (DUAL CREDIT) - 4802**

2 CREDITS (1 PER SEMESTER)

Introduction to Engineering Design is a fundamental pre-engineering course where students become familiar with the engineering design process. Students work both individually and in teams to design solutions to a variety of problems using industry standard sketches and current 3D design and modeling software to represent and communicate solutions. Students apply their knowledge through hands-on projects and document their work with the use of an engineering notebook. Students begin with completing structured activities and move to solving open-ended projects and problems that require them to develop planning, documentation, communication, and other professional skills. Ethical issues related to professional practice and product development are also presented. NOTE: This course aligns with the PLTW Introduction to Engineering Design curriculum. Use of the PLTW curriculum may require additional training and membership in the PLTW network.

- Recommended Grade(s): 9, 10, 11
- Required Prerequisites: None
- Counts as a directed elective or elective for all diplomas

### **PRINCIPLES OF ENGINEERING (DUAL CREDIT) - 5644**

2 CREDITS (1 PER SEMESTER)

Principles of Engineering is a course that focuses on the process of applying engineering, technological, scientific and mathematical principles in the design, production, and operation of products, structures, and systems. This is a hands-on course designed to provide students interested in engineering careers to explore experiences related to specialized fields such as civil, mechanical, and materials engineering. Students will engage in research, development, planning, design, production, and project management to simulate a career in engineering. The topics of ethics and the impacts of engineering decisions are also addressed. Classroom activities are organized to allow students to work in teams and use modern technological processes, computers, CAD software, and production systems in developing and presenting solutions to engineering problems. Schools may use the PLTW curriculum to meet the standards for this course. NOTE: This course aligns with the PLTW Principles of Engineering curriculum. Use of the PLTW curriculum may require additional training and membership in the PLTW network.

- Grade Level(s): 10, 11
- Required Prerequisites: Introduction to Engineering Design
- Fulfills a science course requirement for all diplomas
- Counts as a quantitative reasoning course
- **Note: Students must have received college credit in Introduction to Engineering to be eligible for dual credit in Principles of Engineering**

## **DIGITAL ELECTRONICS (DUAL CREDIT) - 5538**

2 CREDITS (1 PER SEMESTER)

Digital Electronics is a course of study in applied digital logic that encompasses the design and application of electronic circuits and devices found in video games, watches, calculators, digital cameras, and thousands of other devices. Instruction includes the application of engineering and scientific principles as well as the use of Boolean algebra to solve design problems. Using computer software that reflects current industry standards, activities should provide opportunities for students to design, construct, test, and analyze simple and complex digital circuitry software will be used to develop and evaluate the product design. This course engages students in critical thinking and problem-solving skills, time management and teamwork skills. NOTE: This course aligns with the PLTW Digital Electronics curriculum. Use of the PLTW curriculum may require additional training and membership in the PLTW network.

- Grade Level: Grade 11, 12
- Required Prerequisites: Introduction to Engineering Design, Principles of Engineering
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas
- Counts as a quantitative reasoning course
- **Note: Students must have completed four semesters of classes with a 2.6 or higher GPA OR meet the minimum PSAT/SAT/ACT or Ivy Tech Knowledge assessment scores as a prerequisite to receive dual credit (see counselor for details)**

## **CIVIL ENGINEERING AND ARCHITECTURE (DUAL CREDIT) - 5650**

2 CREDITS (1 PER SEMESTER)

Civil Engineering and Architecture introduces students to the fundamental design and development aspects of civil engineering and architectural planning activities. Application and design principles will be used in conjunction with mathematical and scientific knowledge. Computer software programs should allow students opportunities to design, simulate, and evaluate the construction of buildings and communities. During the planning and design phases, instructional emphasis should be placed on related transportation, water resource, and environmental issues. Activities should include the preparation of cost estimates as well as a review of regulatory procedures that would affect the project design. NOTE: This course aligns with the PLTW Civil Engineering and Architecture curriculum. Use of the PLTW Curriculum may require additional training and membership in the PLTW network.

- Recommended Grade Level: Grade 11, 12
- Required Prerequisites: Introduction to Engineering Design and Principles of Engineering
- Counts as a directed elective or elective for all diplomas
- Counts as a quantitative Reasoning course
- **Note: Students must have received college credit in Introduction to Engineering to be eligible for dual credit in Civil Engineering and Architecture**

## **TRANSPORTATION, DISTRIBUTION, & LOGISTICS**

### ***AUTOMOTIVE SERVICES (C4 PROGRAM)***

#### **PRINCIPLES OF AUTOMOTIVE SERVICES - 7213**

2 CREDITS (1 PER SEMESTER)

Principles of Automotive Services gives students an overview of the operating and general maintenance systems of the modern automobile. Students will be introduced to the safety and operation of equipment and tools used in the automotive industry. Students will study the maintenance and light repair of automotive systems. Also, this course gives students an overview of the electrical operating systems of the modern automobile. Students will be introduced to the safety and operation of equipment and tools used in the electrical diagnosis and repair in the automotive electrical industry. Students will study the fundamentals of electricity and automotive electronics.

- Recommended Grade: 11
- Required Corequisite: Brake Systems
- Counts as a directed elective or elective for all diplomas
- **Note: This is a C4 program held at Columbus East or Columbus North High School. Transportation is provided by SHS. Students must be on track towards graduation to be eligible to participate.**

#### **BRAKE SYSTEMS - 7205**

2 CREDITS (1 PER SEMESTER)

Brake Systems teaches theory, service, and repair of automotive braking systems. This course provides an overview of various mechanical brake systems used on today's automobiles. This course will emphasize professional diagnosis and repair methods for

brake systems.

- Recommended Grade: 11
- Required Corequisite: Principles of Automotive Services
- Counts as a directed elective or elective for all diplomas
- **Note: This is a C4 program held at Columbus East or Columbus North High School. Transportation is provided by SHS. Students must be on track towards graduation to be eligible to participate.**

### **STEERING AND SUSPENSIONS - 7212**

2 CREDITS (1 PER SEMESTER)

Steering and Suspensions will cover driveline theory and in-car service procedures. Theory and overhaul procedures related to the driveshaft and axle assemblies for front and rear wheel drive vehicles are included as well. Additionally, the course teaches theory, service and repair of automotive steering, and suspension systems. It provides an overview of various mechanical, power, and electrical steering and suspension systems used on today's automobiles and will emphasize professional diagnosis and repair methods for steering and suspension systems.

- Recommended Grade: 12
- Required Prerequisites: Principles of Automotive Services; Brake Systems
- Required Corequisite: Automotive Service Capstone
- Counts as a directed elective or elective for all diplomas
- **Note: This is a C4 program held at Columbus East or Columbus North High School. Transportation is provided by SHS. Students must be on track towards graduation to be eligible to participate.**

### **AUTOMOTIVE SERVICE CAPSTONE - 7375**

2 CREDITS (1 PER SEMESTER)

Automotive Service Capstone further explores important skills and competencies within the Automotive Service Technology Pathway. Students will be exposed to an in-depth study of vehicle electrical systems. The course will cover the fundamentals of electricity and automotive electronics in various automotive systems. Students will understand other topics such as engine repair, climate control, and driveline service. Additionally, Co-Op and Internship opportunities will be available for students.

- Recommended Grade: 12
- Required Prerequisites: Principles of Automotive Services; Brake Systems
- Required Corequisite: Steering and Suspensions
- Counts as a directed elective or elective for all diplomas.
- **Note: This is a C4 program held at Columbus East or Columbus North High School. Transportation is provided by SHS. Students must be on track towards graduation to be eligible to participate.**

## **COMMERCIAL DRIVER'S LICENSE (BCHS)**

### **PRINCIPLES OF TRANSPORTATION AND LOGISTICS - 7386**

2 CREDITS (1 PER SEMESTER)

Principles of Transportation and Logistics examines the structure and importance of the commercial transportation industry in the logistics sector of business. Topics covered include an in-depth examination of the various modes of transportation including discussions of regulations, economics, characteristics, and development in major transportation modes. Also discussed are costing and pricing issues in transportation and relationship management between buyers and sellers of transportation. Additionally, this course introduces students to an overview of the CDL licensure and prepares them to get their CDL permit. **NOTE: Students are required to get a Department of Transportation Physical and Drug Screen.**

- Recommended Grade(s): 11, 12
- Required Corequisites: Commercial Drivers Operation Fundamentals, Advanced Commercial Drivers Operations
- Counts as a directed elective or elective for all diplomas
- Recommended as a one-year concentrator sequence offered through a half day program
- **Note: This is a program held at Brownstown Central High School. Students must provide own transportation to Brownstown. Students must be on track towards graduation to be eligible to participate.**

### **COMMERCIAL DRIVERS OPERATION FUNDAMENTALS - 7387**

2 CREDITS (1 PER SEMESTER)

Commercial Drivers Operation Fundamentals introduces students to an orientation of the CDL industry, the Commercial Driver's License (CDL), driver qualifications, and the commercial vehicle. The vehicle control systems are reviewed and discussed. The vehicle systems including engine, suspension, electrical, and many others are reviewed in detail. The vehicle

inspection is practiced and applied. Range and on the road training in a tractor trailer are major components of this course. Students will discuss driving in a variety of conditions including at night, emergency situations, skidding, and extreme weather. Students will practice many different driving maneuvers including backing, turning, shifting, coupling, and space and speed management in order to prepare for the CDL A exam. This course must be taken concurrently with Advanced Commercial Drivers Operations.

- Recommended Grade(s): 11, 12
- Required Corequisites: Principles of Transportation and Logistics, Advanced Commercial Drivers Operations
- Counts as a directed elective or elective for all diplomas
- Recommended as a one-year concentrator sequence. Must be enrolled in both Commercial Drivers Operations Fundamentals and Advanced Commercial Drivers Operations.
- ***Note: This is a program held at Brownstown Central High School. Students must provide own transportation to Brownstown. Students must be on track towards graduation to be eligible to participate.***

### **ADVANCED COMMERCIAL DRIVERS OPERATIONS - 7388**

2 CREDITS (1 PER SEMESTER)

In Advanced Commercial Drivers Operations, students will continue to practice until mastery of the pre-trip inspection, which is a critical component of passing the CDL A exam. Administrative and professional components of being a professional driver are discussed and explained including hours of service, accident reporting, personal health, communication, and Compliance, Safety, and Accountability (CAS). This course must be taken concurrently with Commercial Drivers Operations Fundamentals. Upon successful completion of Commercial Drivers Operation Fundamentals and Advanced Commercial Drivers Operations the student will be eligible to take the CDL A examination.

- Recommended Grade(s): 11, 12
- Required Corequisites: Principles of Transportation and Logistics, Commercial Drivers Operations Fundamentals
- Counts as a directed elective or elective for all diplomas
- Recommended as a one-year concentrator sequence. Must be enrolled in both Commercial Drivers Operations Fundamentals and Advanced Commercial Drivers Operations