INDIANA COMMISSION *for* HIGHER EDUCATION

Middle School CTE Courses

Course Descriptions and Standards

December 2024

Exploring College and Careers

Exploring College and Careers provides students opportunities to explore their personal goals, interests, and aptitudes as they relate to career concepts, including exploring the 16 national career clusters and Indiana's Next Level Programs of Study, and begin to determine what they want and expect for their future. Students learn about various traditional and nontraditional careers and gain an awareness of the level of education and type of training needed for a variety of careers and occupations. Students build good study habits, expand their technology skills, develop or update their Graduation Plans and complete a college and career readiness exam. Virtual and real-life opportunities are provided for students to observe and explore various careers.

- DOE Code: 0493
- Recommended Grade Level: Middle School
- Recommended Prerequisites: None
- Recommended for all students, to be completed prior to *Preparing for College and Careers*

Exploring College and Careers – Academic Standards

Standard 1 – Exploring Self

1.0 Students will analyze personal characteristics to create a personal profile.

ECC – 1.1 Identify personal and family morals, values, and ethics.

ECC – 1.2 Describe personal aptitudes, interests, and skills.

ECC – 1.3 Explore personal priorities and goals for life and career.

ECC – 1.4 Examine learning style preferences and their application to school and work.

Standard 2 – Exploring College and Careers

2.0 Students will use Career Clusters and Indiana's Next Level Programs of Study to explore careers.

ECC – 2.1 Differentiate between job, occupation, and career.

ECC – 2.2 Locate, understand, and use career information and resources.

ECC – 2.3 Identify workplace and labor market trends (such as economic, global, technology, and social).

ECC – 2.4 Describe the types of careers in each of the 16 national Career Clusters.

ECC – 2.5 Describe postsecondary educational options (such as technical programs, military, apprenticeships, and two- and four- year colleges) and resources for obtaining postsecondary education and training.

Standard 3 – Making Decisions

3.0 Students will apply critical and creative thinking to make decisions and solve problems.

ECC – 3.1 Demonstrate components of critical thinking and creative thinking.

ECC – 3.2 Apply decision-making processes.

ECC – 3.3 Identify choices, options, and consequences of life and career decisions.

Standard 4 – Making a Plan

4.0 Students will create flexible plans for succeeding in secondary education, college, career, and life.

ECC – 4.1 Identify skills needed for career choices and match them to personal abilities and interests.

ECC – 4.2 Explain the impact of selected careers on lifestyle goals.

ECC – 4.3 Review and update high school graduation plan.

ECC – 4.4 Interpret results of self-assessment inventory to create an initial education and career plan.

Standard 5 – Personal Skills

5.0 Students will demonstrate personal skills needed for success in school, life, and career.

ECC – 5.1 Demonstrate habits of mind (i.e., taking responsible risks, thinking and communicating with clarity and precision, questioning and posing problems, thinking independently, applying past knowledge to new situations, remaining open to continuous learning).

ECC – 5.2 Demonstrate personal skills (i.e., attendance, punctuality, responsibility, integrity, getting along with others) that are needed to succeed in school, life, and career.

ECC – 5.3 Demonstrate appreciation for diversity in school, life, and career settings (i.e., people who are different from one another, diverse personal beliefs and attitudes, changing roles of men and women, nontraditional occupations, stereotypes, biases, and culture, intellectual, and environmental barriers).

ECC – 5.4 Demonstrate personal leadership skills to lead and inspire others, accomplish common goals, and function effectively in school, life, and career settings.

Standard 6 – Employability Skills

6.0 Students will demonstrate basic employability skills.

ECC – 6.1 Create the basic components of a personal portfolio.

ECC – 6.2 Demonstrate school, life, and career self-management skills related to responsibility and work ethic (i.e., attendance, punctuality, completion of work on time, dependability, focus, initiative, perseverance, striving to do one's best).

ECC – 6.3 Apply principles of technology and the concept of digital citizenship including safe, legal, and responsible use of information and technology.

ECC – 6.4 Demonstrate standards of personal appearance, attire, grooming, and etiquette appropriate for specific school and life settings.

Middle School Family and Consumer Sciences

Family and Consumer Sciences (F&CS) at the middle school level prepares students to begin their journey toward becoming independent, productive citizens. The Middle School F&CS education program in Indiana is designed to be comprehensive, holistic, and multidisciplinary across F&CS areas of study, and to be compatible with local school-wide approaches. Multiple F&CS areas of study are integrated into the FACS program and offered at each grade level (sixth, seventh, and eighth). Core F&CS Concepts and Core Process Competencies create a foundation for teaching and learning. The Middle School F&CS curriculum provides learning experiences in five domains:

- Career Planning and Continued Education
- Financial Literacy
- Nutrition and Wellness
- Human Development and Relationships
- Life Skills and Resource Management

Course Details:

- DOE Course Code: 0492
- Grade Levels: 6, 7, and 8
- **Length of course** varies according to local program resources and needs:
    - Minimum - 90 hours over the two- or three-year period a student is in middle school
    - Recommended/Preferred - at a minimum, 180 hours over the middle school years for the achievement of the essential units and standards needed by all students; additional days are required for coverage of the more comprehensive Middle School F&CS Framework content and for "elective" units or classes that offer enrichment and/or in-depth coverage of additional F&CS content

Indiana State Board of Education Rules: middle school students are to receive instruction every year in a minimum of two of the following program areas: Agriculture, Business, Family and Consumer Sciences, and Technology Education.

F&CS programs at the middle school are to be based on curriculum and instruction standards that incorporate:

- student-centered curriculum with emphasis on hands-on involvement;
- focus on practical problem-solving skills in developmentally appropriate real-life applications;
- activities that carry into family, work, and community settings;
- activities that aid students in planning for school-to-work transitions;
- increased efforts to maximize involvement in total school programs and in development of the school's basic educational goals for all learners;
- and learning environments, including project-based learning, designed to meet developmental needs of students.

Middle School Family and Consumer Sciences – Academic Standards

Middle School Career Planning and Continued Education

1.0 Students demonstrate knowledge and skills necessary for success in further education, career, and life.

FCS - MS – 1.1 Exploring self, family, and community: Analyze factors that impact self-formation including

- Standards and ethics
- Goals, priorities, and values
- Aptitudes, abilities, interests, and motivations
- Roles, responsibilities, and life events
- Family, career, community, and global connections
- Behavior, etiquette, and personal appearance in different situations

FCS - MS – 1.2 Exploring work: Explore factors that impact personal image and feelings of self-worth including

- Work and individual identity
- Worth ethic and time management/prioritization

FCS - MS – 1.3 Exploring careers: Investigate personal attributes, standards, goals, interests, and aptitudes as they relate to career concepts including

- Career clusters, career pathways, career research
- Career planning, four-year course planning
- Study skills, listening skills, note-taking

Standard 2 – Middle School Financial Literacy

2.0 Students will apply management practices to personal, family, and financial resources.

FCS - MS – 2.1 Identifying and managing resources: Identify and manage resources to provide for personal and family needs and wants including

- Personal and community resources
- Consumer protection laws and resources, marketing/advertising techniques
- Taxes and income
- Controlling personal information, financial account fraud
- Volunteering/charitable giving

FCS - MS – 2.2 Personal and family financial literacy: Demonstrate skills to manage financial resources to meet personal and family goals including

- Budgeting/personal finance plan
- Banking and financial institutions, electronic billing
- Managing credit and debit, credit cards vs. debit cards
- Saving/investing, insurance
- Checking accounts, utilizing financial records

Standard 3 – Middle School Nutrition and Wellness

3.0 Students will demonstrate nutrition, wellness, and food preparation practices that enhance individual and family well-being.

FCS - MS – 3.1 Nutrition: Evaluate nutrition choices and practices in a variety of settings, using reliable guidelines and sources of information including

- Dietary guidelines/My Plate

- Comparing food intake to recommendations/Serving/Portion sizes
- Nutrients, nutritional label analysis
- Selecting foods at home and away

FCS - MS – 3.2 Food and wellness issues: Examine factors and issues that impact current and future health and wellness including

- Activity and exercise
- Food safety and food borne illness
- Wellness issues (i.e., calcium/osteoporosis, diabetes, obesity, eating disorders, cardiovascular health)

FCS - MS – 3.3 Preparing and serving food: Demonstrate skills needed for preparing and serving foods including

- Laboratory/kitchen safety and sanitation practices
- Cooking terms, equivalents, abbreviations, measurements
- Reading and using recipes
- Techniques and equipment for preparing and serving food
- Teamwork in the laboratory setting and hands on activities

Standard 4 – Middle School Human Development and Relationships

4.0 Students will demonstrate relationships skills and understanding in contexts across the life span such as school, parenting, and the workplace

FCS - MS – 4.1 Positive family relationships: Analyze factors that contribute to positive relationships with family members including

- Roles and responsibilities
- Coping with family changes
- Setting rules/boundaries, compromising, cooperating

FCS - MS – 4.2 Caring for children and others: Demonstrate skills for positive guidance and caregiving of children and others including

- Understanding ages and developmental stages from birth through adolescence
- Caregiver responsibilities/babysitting skills
- Handling emergencies and keeping children safe
- Nutritious and developmentally appropriate foods for children
- Children's play and toys (for learning as well as safety, recalls, age appropriateness)

FCS - MS – 4.3 Communication: Examine factors that contribute to positive relationships including

- Communication skills and styles
- Conflict prevention and resolutions

FCS - MS – 4.4 Quality friendships: Analyze factors that contribute to positive relationships with peers including

- Peer pressure, assuming responsibility for choices and actions
- Appreciating diversity
- Changing male/female relationships

Standard 5 – Middle School Life Skills and Resource Management

5.0 Students will integrate multiple life roles and responsibilities in school, family, career, and community settings.

FCS - MS – 5.1 Leadership for life: Demonstrate teamwork and leadership skills including

- Leadership skills and styles
- Taking risks, overcoming setbacks
- Character/citizenship, service
- Working in a group
- Leadership development through FCCLA projects of Chapter activities

FCS - MS – 5.2 Decision making, problem-solving, and critical thinking: Accomplish tasks and fulfill responsibilities by using thinking and problem-solving processes including

- Decision making, evaluating information, and planning processes
- Choices, options, and consequences

FCS - MS – 5.3 Personal safety: Demonstrate skills needed for responsibility for self and self-protection including

- Refusal skills
- Physical, emotional, and sexual abuse

FCS - MS – 5.4 Caring for Resources: Demonstrate skills needed to care for personal and family resources including

- Reading use/care labels and manuals
- Care, repair, and storage of personal resources
- Clothing care, repair, satin removal, laundry

FCS - MS – 5.5 Caring for the environment: Analyze resource consumption and apply conservation practices including

- Product selection and use
- Reduce, reuse, recycle

FCS - MS – 5.6 Using technology wisely in personal and family settings: Demonstrate skills to use technology and evaluate the impact of change and innovations in school, family, career, and community schools

- Technology integration throughout FACS units and topics as possible
- Digital etiquette on email, cell phones, etc.
- Digital ethics; plagiarism, commenting vs. anonymity

Exploring Agriculture Science and Business

Exploring Agriculture is a course that is suggested to be a semester long but can be refined to fit the needs of each school. The nature of this course is to provide students with an overview of various aspects of the agriculture industry. Topics to be covered in this course can include leadership, supervised agriculture experience, plant and soil science, natural resources, animal science, agribusiness, food science, and power, structure and technical systems.

Exploring Agriculture introduces students to many careers in agriculture. These careers range from Agritourism Manager to Veterinarian and Implement Salesman to Agriculture Lawyer.

- DOE Code: 0496
- Recommended Grade Level: 5-8
- Recommended Prerequisites: None
- This course is tailored to fit the needs of the school's agriculture program. It is suggested that standards from the FFA domain are covered in each program as well as careers associated with each domain. From there, programs can choose domains that best fit the school's time constraints, resources, and capabilities.

Career and Technical Student Organizations (CTSOs)
Career and Technical Student Organizations are considered a powerful instructional tool when integrated into Career and Technical Education courses. They enhance the knowledge and skills students learn in a course by allowing a student to participate in a unique program of career and leadership development. Students in this course should be encouraged to participate in FFA.

Middle School Exploring Agriculture Science and Business Education – Academic Standards

Leadership

1.0 Students can see the importance of developing leadership skills and how the National FFA Organization (FFA) can be a critical component of a well-rounded agricultural education.

EA – 1.1 Recognize and explain the role of FFA in the development of leadership, employability, communications, and human relation skills.

EA – 1.2 Develop an understanding of the history of the National FFA Organization.

EA – 1.3 Identify and understand personality types to be able to work with others effectively on a team.

Standard 2 –Supervised Agriculture Experience

2.0 Students see the importance of a Supervised Agriculture Experience (SAE) program and how it is a critical component of a well-rounded agricultural education.

EA – 2.1 Explain the nature of and become familiar with those terms related to an SAE program.

EA – 2.2 Explore the numerous possibilities for an SAE program which a student might develop.

EA – 2.3 Understand and apply basic record keeping skills.

Standard 3 – Plant, Soil, and Horticulture Science

3.0 Students have an understanding of plant and soil science and how it relates to the agricultural industry.

EA – 3.1 Understand the basic needs of plant growth from germination to soil fertility.

EA – 3.2 Explore and recognize the importance of plant and soil science as it relates to the agricultural industry.

EA – 3.3 Identify and describe basic plant structures and their roles within the plant.

EA – 3.4 Identify basic soil properties.

EA – 3.5 Explore the importance of biotechnology as it relates to feeding a growing world population.

Standard 4 – Natural Resources

4.0 Students gain an understanding of preserving and replenishing our natural resources through natural resource management.

EA – 4.1 Identify renewable and nonrenewable resources and how they relate to everyday life.

EA – 4.2 Explore the interaction between local natural resources and the economy.

EA – 4.3 Understand the relationship between wildlife habitats and human population.

Standard 5 – Animal Science

5.0 Students gain an understanding of the importance of the animal industry.

EA – 5.1 Share and explain the care and management of various animals in the livestock and companion animal industries.

EA – 5.2 Understand the relationship between wildlife habitats and human population.

EA – 5.3 Explain common uses of animals.

EA – 5.4 Identify common species and/or breeds of livestock.

Standard 6 - Agribusiness

6.0 Students recognize basic economic principles and how they relate to agricultural business management.

EA – 6.1 Recognize the influence of social media as it relates to agricultural businesses.

EA – 6.2 Define agritourism and how it affects the agricultural industry.

EA – 6.3 Apply principles of personal finances that are used in everyday life.

Standard 7 – Food Science

7.0 Students examine components of the food industry and how they relate to agriculture.

EA – 7.1 Explore how various foods are grown and processed through the concept of farl to plate.

EA – 7.2 Apply concepts of MyPlate to a balanced diet for all ages.

EA – 7.3 Recognize food safety principles and management techniques.

Standard 8 – Power, Structure, and Technical Systems

8.0 Students examine the scope of career opportunities in the importance of agriculture to the economy.

EA – 8.1 Recognize and apply safety principles as they relate to agriculture and everyday life.

EA – 8.2 Identify and understand the uses of various hand and power tools.

EA – 8.3 Explore modern technology applications within the agriculture industry.

Standard 9 - Careers

9.0 Students examine the scope of career opportunities in, and the importance of, agriculture to the economy.

EA – 9.1 Evaluate the nature and scope of agriculture in society and the economy.

EA – 9.2 Describe career opportunities, and means to achieve those opportunities, in agriculture.

EA – 9.3 Explore those qualities, attributes, and skills necessary to succeed in a chosen agricultural career.

Exploring Engineering and Technology

Engineering and Technology Education – Middle Level provides students with hands-on, problem-based learning opportunities that introduce the principles to develop, produce, use, and assess products related to engineering and technology. Students additionally develop individual and teamwork skills to participate in society and the workplace. The four domains included in these standards are general engineering and technology concepts, engineering design

and development, producing and using technology, and technology careers. Activities should focus on content related to engineering and technology as a body of knowledge, using resources and actions to: (1) apply engineering design, (2) use processes to produce artifacts and systems, (3) use devices tools and systems safely and appropriately, (4) and assess impacts on society and the environment. Along with the current academic standards for this subject, the Science/Technical Studies Content Area Literacy Standards are incorporated with the expectation of a continuum of reading and writing skills development.

- DOE Code: 0490
- Recommended Grade Level: 6-8

Middle School Requirement:
Middle School students are to receive instruction every year in a minimum of two of the following areas: Agriculture, Business, Family and Consumer Science, and Engineering Technology Education. (511 IAC 6.1-5-3.6(b)(6)).

The curriculum is designed for a minimum of 36 weeks of instruction, which may be divided into 9-, 12-, 18-, or 36-week segments to accommodate local school scheduling.

Implementation Guidance:
Engineering and Technology Education at the middle school covers a wide variety of topics to prepare students for course choices at the high school level. Domains 1, 2, and 4 are considered **essential**. Domain 3 could be considered "as time permits". To allow students to have experiences in transportation, construction, manufacturing, energy and power, biotechnology, and communications, it is *recommended* that students receive instruction in engineering and technology education every year.

Career and Technical Student Organizations (CTSOs)
Career and Technical Student Organizations are considered a powerful instructional tool when integrated into Career and Technical Education programs. They enhance the knowledge and skills students learn in a course by allowing a student to participate in a unique program of career and leadership development. Students should be encouraged to participate in the Technology Student Association (TSA).

Middle School Engineering and Technology – Academic Standards

General Engineering and Technology Concepts

1.0 ***Students will examine how engineering and technology helps improve, manage, and control natural and engineered environments.***

ETE – 1.1 Illustrate the purpose of engineering and technology in society.

ETE – 1.2 Identify how engineering and technology impact individuals, society, and the environment.

ETE – 1.3 Apply the universal systems model when studying areas of engineering and technology.

ETE – 1.4 Demonstrate safe practices and procedures with tools and equipment.

2.0 ***Students will integrate engineering and technology into academic fields, including the STEM disciplines.***

ETE – 2.1 Analyze the interdisciplinary nature of engineering and technology.

FCS - MS – 2.2 Apply knowledge and skills learned in science, mathematics, language arts, fine arts, and social studies classes when completing engineering and technology-based assignments.

3.0 ***Students will investigate the evolution of engineering and technology of products, structures, and systems.***

ETE – 3.1 Analyze how the eras in history are based on technological innovations and practices of the period.

ETE – 3.2 Investigate inventions and innovations of products, processes, materials, and tools.

ETE – 3.3 Compare technology inventions and innovations and the positive/negative impacts on society and the environment.

Engineering Design and Development

4.0 ***Students will apply engineering principles when planning, developing, implementing, and analyzing technological solutions.***

ETE – 4.1 Apply the steps of the design process.

ETE – 4.2 Use the design process to create a product that addresses a real-world problem.

ETE – 4.3 Create a technical sketch of a design with appropriate annotation.

ETE – 4.4 Develop a product using the design process, while maintaining appropriate documentation.

ETE – 4.5 Develop various types of models (graphical, physical, or mathematical) that help communicate solutions to peers.

5.0 ***Students will apply the principles of automation and robotics.***

ETE – 5.1 Differentiate between the functions of motors, gears, sensors, wheels, and control systems.

ETE – 5.2 Interpret a technical document to build a working prototype of an automated system.

ETE – 5.3 Design a working prototype or mechanical system to solve a pre-designated task.

ETE – 5.4 Utilize the principles of computer science and information technologies by developing applications and codes applying to automation and robotics.

Producing and Using Technology

6.0 ***Students will select, use, create, and evaluate transportation technologies.***

ETE – 6.1 Compare and contrast the different types and uses of land, sea, air, space, and intermodal transportation.

ETE – 6.2 Differentiate between the technical sub-systems common of all vehicles including, propulsion, structural, suspension, control, information, and support systems.

ETE – 6.3 Design, develop, and evaluate transportation systems.

7.0 ***Students select, use, create, and evaluate construction technologies.***

ETE – 7.1 Investigate various types of construction systems including residential, industrial, commercial, and civil.

ETE – 7.2 Utilize appropriate designs, techniques, tools, and processes for construction systems.

ETE – 7.3 Construct simulations, models, and/or structures for specific construction systems.

8.0 ***Students select, use, create, and evaluate manufacturing technologies.***

ETE – 8.1 Investigate various types of manufacturing systems including continuous, batch, and custom.

ETE – 8.2 Utilize appropriate designs, techniques, tools, materials, and processes for manufacturing systems.

ETE – 8.3 Produce simulations, models, and/or prototypes for specific manufacturing systems.

ETE – 8.4 Describe and create a logistical path a product takes from its point of origin to its destination.

9.0 ***Students select, use, create, and evaluate biotechnologies.***

ETE – 9.1 Investigate various types of biotechnologies including agricultural, genetics, medical, and imaging technologies.

ETE – 9.2 Examine appropriate designs, techniques, tools, and processes for medical or genetic engineering.

ETE – 9.3 Construct simulations, models, and/or prototypes for specific biotechnology disciplines.

10.0 ***Students will identify, select, and use energy and power technologies.***

ETE – 10.1 Analyze a variety of power and energy technology systems.

ETE – 10.2 Solve a simple power and energy challenge and create an efficient solution.

ETE – 10.3 Utilize appropriate designs, techniques, tools, and processes for energy and/or power systems.

ETE – 10.4 Design and construct simulations, models, and/or prototypes for specific power systems.

11.0 ***Students will select, use, create, and evaluate communication technologies.***

ETE – 11.1 Evaluate the parts of a communication system.

ETE – 11.2 Investigate various types of communication technologies including analog and digital technologies.

ETE – 11.3 Design and construct simulations/models/prototypes for specific communication systems.

ETE – 11.4 Analyze how information technology impacts models of communication.

Engineering and Technology Careers

12.0 ***Students will explore engineering and technology related careers.***

ETE – 12.1 Investigate careers in engineering and technology pathways.

ETE – 12.2 Analyze education and skill requirements for engineering and technology professions.

ETE – 12.3 Report on the outlook, demand, and projected wages for engineering and technology careers.