

CTE - CIP Course Details Catalog

Cluster: Science, Technology, Engineering and Mathematics

CIP: 15.0000 - Engineering Technology, General.

Status: Open **Start Year:** 2011 **End Year:**

Minimum Carnegie Units: 2.00

Group 1

Minimum Course Selection: School: 1 ACC: 0 Regional: 0

State Course ID	State Course Title	Max Carnegie Units	Start SY	End SY
13052A001	Production Technology	1.00	2011	
11002A001	Communication Technology	1.00	2011	
20001A001	Transportation Technology	1.00	2011	
20101A001	Energy Utilization Technology	1.00	2011	
21052A002	Introduction to Technology and Engineering (Industrial)	1.00	2011	
21052A001	Foundations of Technology	1.00	2012	
21006A001	Introduction to Engineering Design	3.00	2012	
21102A002	Beginning Drafting	1.00	2017	

Group 2

Minimum Course Selection: School: 0 ACC: 1 Regional: 1

State Course ID	State Course Title	Max Carnegie Units	Start SY	End SY
21001A001	Principles of Technology I	3.00	2011	
21001A002	Principles of Technology II	3.00	2011	
21006A001	Introduction to Engineering Design	3.00	2011	2011
21004A001	Principles of Engineering	3.00	2011	
21008A001	Digital Electronics	3.00	2011	
21052A001	Foundations of Technology	1.00	2011	2011
21054A001	Technological Design and Innovation	3.00	2011	
21009A001	Robotics	3.00	2012	
21053A001	Emerging Technologies	3.00	2013	

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Group 3

Minimum Course Selection: School: 0 ACC: 0 Regional: 0

State Course ID	State Course Title	Max Carnegie Units	Start SY	End SY
21010A001	Computer Integrated Manufacturing	3.00	2011	
21013A001	Aerospace Engineering	3.00	2011	
21014A001	Biotechnical Engineering	3.00	2011	2017
21012A001	Civil Engineering and Architecture	3.00	2011	
21007A002	Engineering Design & Development	3.00	2011	
21054A002	Advanced Design Applications (EbD)	3.00	2011	2017
21054A003	Advanced Technological Applications (EbD)	3.00	2011	2017
21006A002	Engineering Design	3.00	2011	
22153A001	Cooperative Education	3.00	2011	
21054A004	Technology, Society and Sustainability	3.00	2017	

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Course Descriptions

CIP: 15.0000 - Engineering Technology, General.

State Course ID: 13052A001 **Course Title:** **Production Technology**

Production Technology is a course designed to foster an awareness and understanding of manufacturing and construction technology. Through a variety of learning activities, students are exposed to many career opportunities in the production field. Experiences in manufacturing include product design, materials and processes, tools and equipment including computers, safety procedures, corporate structure, management, research and development, production planning, mass production, marketing and servicing. In construction, students are exposed to site preparation, foundations, building structures, installing utilities, and finishing and servicing structures.

State Course ID: 11002A001 **Course Title:** **Communication Technology**

Communication Technology is a course designed to foster an awareness and understanding of the technologies used to communicate in our modern society. Students gain experience in the areas of design and drafting, radio and television broadcasting, computers in communication, photography, graphic arts, and telecommunications.

State Course ID: 20001A001 **Course Title:** **Transportation Technology**

Transportation Technology is a course designed to foster an awareness and understanding of the various transportation customs that make up our mobile society. Through laboratory activities, students are exposed to the technologies of and career opportunities involved in material handling, atmospheric and space transportation, marine transportation, terrestrial transportation, and computer uses in transportation technology.

State Course ID: 20101A001 **Course Title:** **Energy Utilization Technology**

Energy Utilization Technology is a course designed to foster an awareness and understanding of how we use energy in our industrial technological society. Areas of study include conversion of energy, electrical fundamentals, solar energy resources, alternate energy resources such as wind, water, and geothermal; fossil fuels, nuclear power, energy conservation, and computer uses in energy technology. Students use laboratory experiences to become familiar with current energy technologies.

State Course ID: 21052A002 **Course Title:** **Introduction to Technology and Engineering (Industrial)**

Introduction to Technology & Engineering is comprised of the following areas: Production, Transportation, Communication, Energy Utilization and Engineering Design but is not limited to these areas only. This course will cover the resources, technical processes, industrial applications, material sciences, technological impact and occupations encompassed by that system.

State Course ID: 21052A001 **Course Title:** **Foundations of Technology**

The course employs teaching/learning strategies that enable students to build their own understanding of new ideas. It is designed to engage students in exploring and deepening their understanding of "big ideas" regarding technology and apply technological processes to solve real problems and develop knowledge and skills to design, modify, use and apply technology in the following areas: engineering design, manufacturing technologies, construction technologies, energy & power, information & communication technologies and emerging technologies.

State Course ID: 21006A001 **Course Title:** **Introduction to Engineering Design**

Engineering Design courses offer students experience in solving problems by applying a design development process. Often using solid modeling computer design software, students develop, analyze, and test product solutions models as well as communicate the features of those models.

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CIP: 15.0000 - Engineering Technology, General.

State Course ID: 21102A002 **Course Title:** Beginning Drafting

Beginning Drafting is an introductory level drafting course. During this course students will learn the basic fundamentals of drafting and/or computer aided drafting (CAD). The instruction will include the care and use of drafting equipment, freehand sketching, orthographic projection, lettering techniques, dimensioning standards, pictorial drawings, drawing reproduction, and an introduction to CAD.

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CIP: 15.0000 - Engineering Technology, General.

State Course ID: 21001A001 **Course Title:** Principles of Technology I

This course provides learning experiences related to the principles that underlie today's high technology: force, work, rate, resistance, energy, power, and force transformers. The course deals with these principles as they apply in each of the four systems that make up both the simplest and the most complex technological devices and equipment: mechanical systems, fluid systems, electrical systems, and thermal systems. Learning experiences are designed to allow students to acquire knowledge and skills which are transferable to postsecondary technical programs.

State Course ID: 21001A002 **Course Title:** Principles of Technology II

This course includes learning experiences related to the principles that underlie today's high technology: momentum, waves and vibrations, energy converters, transducers, radiation, optical systems, and time constraints. The course deals with these principles as they apply in each of the systems that make up both the simplest and the most complex technological devices and equipment: mechanical systems, fluid systems, electrical systems, and thermal systems. Learning experiences are designed to allow students to acquire knowledge and skills which are transferable to postsecondary technical programs.

State Course ID: 21006A001 **Course Title:** Introduction to Engineering Design

Engineering Design courses offer students experience in solving problems by applying a design development process. Often using solid modeling computer design software, students develop, analyze, and test product solutions models as well as communicate the features of those models.

State Course ID: 21004A001 **Course Title:** Principles of Engineering

Principles of Engineering courses provide students with an understanding of the engineering/technology field. Students typically explore how engineers use various technology systems and manufacturing processes to solve problems; they may also gain an appreciation of the social and political consequences of technological change.

State Course ID: 21008A001 **Course Title:** Digital Electronics

Digital Electronics courses teach students how to use applied logic in the development of electronic circuits and devices. Students may use computer simulation software to design and test digital circuitry prior to the actual construction of circuits and devices.

State Course ID: 21052A001 **Course Title:** Foundations of Technology

The course employs teaching/learning strategies that enable students to build their own understanding of new ideas. It is designed to engage students in exploring and deepening their understanding of "big ideas" regarding technology and apply technological processes to solve real problems and develop knowledge and skills to design, modify, use and apply technology in the following areas: engineering design, manufacturing technologies, construction technologies, energy & power, information & communication technologies and emerging technologies.

State Course ID: 21054A001 **Course Title:** Technological Design and Innovation

In this course, technological design and innovation are presented through practical applications. Students apply technology, science, and mathematics concepts and skills to solve technological/engineering problems and innovative designs. Students research, develop, create simulations, test, and analyze engineering designs using criteria such as design effectiveness, public safety and human factors.

State Course ID: 21009A001 **Course Title:** Robotics

Robotics courses develop and expand students' skills and knowledge so that they can design and develop robotic devices. Topics covered in the course may include mechanics, electrical and motor controls, pneumatics, computer basics, and programmable logic controllers.

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CIP: 15.0000 - Engineering Technology, General.

State Course ID: 21053A001 **Course Title:** Emerging Technologies

Emerging Technologies courses emphasize students' exposure to and understanding of new and emerging technologies. The range of technological issues varies widely but typically include lasers, fiber optics, electronics, robotics, computer technologies (software engineering), Game Art and Design, CAD/CAM, communication modalities, and transportation technologies.

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CIP: 15.0000 - Engineering Technology, General.

State Course ID: 21010A001 **Course Title:** Computer Integrated Manufacturing

Computer Integrated Manufacturing courses involve the study of robotics and automation. Building on computer solid modeling skills, students may use computer numerical control (CNC) equipment to produce actual models of their three-dimensional designs. Course topics may also include fundamental concepts of robotics, automated manufacturing, and design analysis.

State Course ID: 21013A001 **Course Title:** Aerospace Engineering

Aerospace Engineering courses introduce students to the world of aeronautics, flight, and engineering. Topics covered in the course may include the history of flight, aerodynamics and aerodynamics testing, flight systems, astronautics, space life systems, aerospace materials, and systems engineering.

State Course ID: 21014A001 **Course Title:** Biotechnical Engineering

Biotechnical Engineering courses enable students to develop and expand their knowledge and skills in biology, physics, technology, and mathematics. Course content may vary widely, drawing upon diverse fields such as biomedical engineering, biomolecular genetics, bioprocess engineering, agricultural biology, or environmental engineering. Students may engage in problems related to biomechanics, cardiovascular engineering, genetic engineering, agricultural biotechnology, tissue engineering, biomedical devices, human interfaces, bioprocesses, forensics, and bioethics.

State Course ID: 21012A001 **Course Title:** Civil Engineering and Architecture

Civil Engineering and Architecture courses provide students with an overview of the fields of Civil Engineering and Architecture while emphasizing the interrelationship of both fields. Students typically use software to address real world problems and to communicate the solutions that they develop. Course topics typically include the roles of civil engineers and architects, project-planning, site-planning, building design, project documentation, and presentation.

State Course ID: 21007A002 **Course Title:** Engineering Design & Development

Engineering Design and Development courses provide students with the opportunity to apply engineering research principles as they design and construct a solution to an engineering problem. Students typically develop and test solutions using computer simulations or models but eventually create a working prototype as part of the design solution.

State Course ID: 21054A002 **Course Title:** Advanced Design Applications (EbD)

This course consists of four units including Manufacturing, Energy and Power, Construction and Transportation. The Manufacturing unit examines the advances that maintain manufacturing efficiency, how human consumption affects manufacturing, how manufacturing affects the standard of living of various peoples, and how processing and changing raw materials can produce more desirable products. The Construction unit examines a number of factors influencing the design and construction of permanent and semi-permanent structures, the practices related to construction maintenance, alteration, and renovation and the functions of the primary systems installed in those structures. The Energy & Power unit explores the relationship between energy and power technologies and all other technologies, and how modern energy and power systems impact cultures, societies, and the environment. It also offers an examination of how energy and power systems can become more efficient and how they may be utilized in problem solving. The Transportation unit examines the complex networks of interconnected subsystems that comprise each transportation system, and the roles of these components in the overall functional process of the system. It also analyzes the improvements and the impacts of transportation technologies on the environment, society, and culture.

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CIP: 15.0000 - Engineering Technology, General.

State Course ID: 21054A003 **Course Title:** **Advanced Technological Applications (EbD)**

In this course, students study four components of the Designed World including Information Technology, Agriculture and Bio-related Technologies, Medical, and Entertainment/Recreation. The Information Technologies unit examines how technology facilitates the gathering, manipulation, storage, and transmission of data, and how this data can be used to create useful products. It also provides students with opportunities for developing communications systems that can solve technological problems. The Agriculture and Biotechnologies unit explores how agricultural technologies provide increased crop yields and allow adaptation to changing and harsh environments, enabling the growth of plants and animals for various uses. It also offers an analysis of the various uses of biotechnology and the ethical considerations of those uses. The Medical Technologies Unit provides an analysis of how medical technologies are used to increase the quality and length of human life, and how increased use of technology carries potential consequences which require public debate. Students also examine tools and devices used to repair and replace organs, prevent disease, and rehabilitate the human body. The Entertainment and Recreation unit provides a study of technological entertainment and recreation systems with an examination of the differences between these technologies, how their use enhances human leisure-time performance, and the social, cultural, and environmental implications of their usage.

State Course ID: 21006A002 **Course Title:** **Engineering Design**

In this course, engineering scope, content, and professional practice are presented through practical applications. Students in engineering teams apply technology, science, and mathematics concepts and skills to solve engineering design problems and create innovative designs. Students research, develop, test, and analyze engineering designs using criteria such as design effectiveness, public safety, human factors, and ethics. This course is the capstone experience for students who are interested in Technology, Innovation, Design, and Engineering.

State Course ID: 22153A001 **Course Title:** **Cooperative Education**

Cooperative Education is a capstone course designed to assist students in the development of effective skills and attitudes through practical, advanced instruction in school and on the job through cooperative education. Students are released from school for their paid cooperative education work experience and participate in 200 minutes per week of related classroom instruction. Classroom instruction focuses on providing students with job survival skills and career exploration skills related to the job and improving students' abilities to interact positively with others. For skills related to the job, refer to the skill development course sequences, the task list or related occupational skill standards of the desired occupational program. The course content includes the following broad areas of emphasis: further career education opportunities, planning for the future, job-seeking skills, personal development, human relationships, legal protection and responsibilities, economics and the job, organizations, and job termination. A qualified career and technical education coordinator is responsible for supervision. Written training agreements and individual student training plans are developed and agreed upon by the employer, student and coordinator. The coordinator, student, and employer assume compliance with federal, state, and local laws and regulations.

State Course ID: 21054A004 **Course Title:** **Technology, Society and Sustainability**

Technology, Society and Sustainability course will provide an overview of the importance of, impact on, and relationships between technological endeavors and society at large. This courses typically emphasize environmental factors, economics impacts and the influences of society on technological /environmental endeavors.