

**EMIS Change 27-20**

This change adds a few new CTE subject codes and deletes several others. The descriptions for three subject codes have also been updated.

February 25, 2026, update: This update moves several subject codes from the Agricultural & Environmental Systems Codes table to the new Energy Codes table. The codes being moved are marked in the Ag table by green text with a double strikethrough and in the Energy table by green text with a double underline.

## SECTION 4.7: SUBJECT CODES

### CAREER-TECHNICAL EDUCATION SECTION

#### Workforce Development Section

Table 20. Career Field 01: Agricultural & Environmental Systems Codes (01xxxx)

Subject Code	Description	Core Subject Area (for proper cert)
<del>010990</del>	<del><b>Energy and Power</b> Students will be introduced to the many career and educational opportunities that exist in the energy and power industry. Students will research, design, and build a series of authentic, hands-on projects that will enable them to understand the interplay of the generation, distribution and use of energy. Systems thinking will be used to teach how things work by understanding how the parts influence the entire system and how the system impacts the parts.</del>	<del>—</del>
<del>010995</del>	<del><b>Oil and Gas</b> Students will be introduced to the many career opportunities that exist in the oil and gas industry. Students will apply skills applicable to exploration, extraction and production of oil and gas. Additionally, students will apply monitoring and control techniques for effective environmental management. Lastly, students will become familiar with wellhead and surface production equipment related to the oil and gas industries.</del>	<del>—</del>
<del>010999</del>	<del><b>Clean Energy</b> Students will apply fundamental science and operating principles of clean energy systems to authentic problems. Such problems involve motors and generators, photovoltaic systems, water and energy conservation, wind turbines, bio-fuel generation, bioreactors, water power, energy harvesting, fuel cells and nuclear power. Students will use engineering design processes to develop solutions to these authentic problems.</del>	<del>—</del>
<u>010710</u>	<u><b>Natural Resources</b> Students will apply science principles and management practices to the protection of renewable and non-renewable natural resources. Students will learn fundamentals of land use as well as watershed, wildlife, fishery and forest management. Furthermore, students will learn management practices related to managing air and water quality along with requirements for managing solid and</u>	<u>==</u>

Subject Code	Description	Core Subject Area (for proper cert)
	<del>liquid waste. Throughout the course, students will apply communications, business principles and leadership skills.</del>	
010715	<del><b>Energy Systems Management</b> Students will apply basic principles of energy accounting, thermodynamics and heat transfer, energy conversion and efficiency to heating, power generation and transportation. Students will apply the principles and practices needed for managing both renewable and non-renewable energy sources including, solar thermal, hydrogen generation, photovoltaic, hydroelectric, biomass use, geothermal heat transfer, and fossil fuel. Future energy systems and energy use scenarios are investigated, with a focus on promoting the use of renewable energy resources and technologies.</del>	==
010716	<del><b>Bio-Energy</b> Students are introduced to the scientific and technical processes of biofuel/bio-energy production. Learners will evaluate the energy conversion process and methods for optimizing the fermentation process. Students will identify the systems and components employed by fermentation systems and communicate safe handling techniques of equipment, biomass, effluent and biogas. A focus will be given to environmental impacts, life cycle analysis, and economic analysis of bioenergy production.</del>	==
010717	<del><b>Solar and Wind Energy</b> Students will specify system options by conducting Energy Site Assessments by using and interpreting resource maps, performance data, zoning requirements and interferences, installation timelines and price. Students will read plans, lay out components and assemble electrical systems. Students will perform system checkouts and interpret results from mechanical and electrical diagnostic reports and compile and maintain system records. Students will apply safety regulations and requirements and identify and mitigate public safety issues during system installations.</del>	==
010718	<del><b>Oil and Gas Operations</b> Students will develop the skills applicable to careers in petroleum, natural gas and coal industries. They will learn practices related to exploration, leasing, surveying, drilling, geophysical logging and completion process. Students will be familiar with wellhead and surface production equipment and interpret production histories and graphs. Students will learn sampling, analysis, monitoring and control techniques for effective environmental management in the extractive industries and the principals of metering, sales and marketing.</del>	==
010725	<del><b>Environmental Systems Management</b> Learners will analyze and interpret biological, chemical and physical properties of soil, water and air. They will determine the source and type of environmental contamination, evaluate pollution control measures and be prepared to respond accordingly. Learners will be able to monitor treatment processes for potable water, waste water and solid waste. Learners will develop and implement environmental plans using principles governing ecosystems in relation to resource development and industrial processes.</del>	==

Subject Code	Description	Core Subject Area (for proper cert)
<del>010730</del>	<del><b>Forestry and Woodland Ecosystems</b> Learners will apply principles of botany, dendrology and silviculture to the management of forests and forest ecosystems. Learners will apply principles of timber cruising with surveying and mapping techniques to take forest measurements. Learners will develop the knowledge and skills necessary for forest reforestation, timber stand improvement, timber harvesting and forest product utilization. Learners will operate and maintain forestry equipment, apply fire management practices, and understand related regulations, laws, and policy issues.</del>	<del>==</del>
<del>010735</del>	<del><b>Park and Recreational Management</b> Students will design facilities, develop educational programs and manage resources for use in public recreation. Students will maintain and operate equipment for maintaining wildlife habitat and supporting a variety of public recreational activities. Students will develop marketing and programming skills for park development, apply management practices to park operations and learn the systems required to maintain public safety.</del>	<del>==</del>
<del>010740</del>	<del><b>Urban Forestry</b> The learner will promote the care and management of trees for residential and commercial purposes. Learners will apply principles of soil management, dendrology and pest management to the care and management of trees. Learners will analyze budgets, and develop short and long range management plans that balance environmental and economic goals and that support sustainable land use patterns. Principles of rigging, advanced rope techniques, and chainsaw applications for tree pruning and removal will be learned.</del>	<del>==</del>
<del>010745</del>	<del><b>Wildlife and Fisheries</b> Learners will apply the principles and practices of resource conservation and management to fish and wildlife populations. Students learn to properly handle wild animals, principles of wildlife nutrition, inventory practices, water quality parameters and testing, and natural and artificial propagation. Learners will apply principles of facility design and layout for managing fish populations. Learners will research and evaluate the impacts of various land practices, legislation, and human activities on habitats and populations.</del>	<del>==</del>

Table 21. Career Field 02: Arts & Communications Codes (04xxxx, 34xxxx)

Subject Code	Description	Core Subject Area (for proper cert)
<del>340001</del>	<del><b>Arts and Communication Primer</b> The worlds of art designers, performers, and media artists intersect historically, culturally and aesthetically. In this introductory course for the Arts and Communication Career Field, students learn the basics of performance, design, audio, and video. They review brochures, photographs, news stories, videos, and other products common to the visual, media and performing arts industries.</del>	<del>—</del>

Subject Code	Description	Core Subject Area (for proper cert)
340250	<b>Stagecraft</b> Creating the set, balancing the lights, projecting video and engineering the sound all help to accentuate the script and characters in a show. Students learn the skills of stagecraft through research, critique, and hands-on experience. They use technology, background design, makeup, and costuming to enhance overall production with a focus on the script and director vision.	—
340255	<b>Stage Design and Construction</b> This course focuses on design and construction of what the audience sees around actors. Students analyze scripts and budgets to determine appropriate sets. They create renderings and drawings by hand and through computer drafting programs to present the designer's vision. They develop models, mock-ups, and final construction of scenery. In addition to construction techniques, they acquire workplace skills such as leadership, collaboration, and safety.	—

Table 25. Career Field 06: Engineering & Science Technologies Codes (17xxxx)

Subject Code	Description	Core Subject Area (for proper cert)
175990	<b>Automated Materials Joining Technology</b> Students will be introduced to innovative materials development and use, structural design and product integrity in relation to automated materials joining. Students will explore materials joining and forming methods, computer-aided design and automated systems that transform design concepts into fully developed products. Lastly, students will be introduced to a variety of career possibilities.	—
175995	<b>Innovations in Science and Technology</b> Students will be introduced to technological literacy and stimulate their interest in pursuing a career in science, technology, engineering and mathematics (STEM). Students will engage in hands-on experiences they need to be successful in the new global workforce. Finally, students will apply critical thinking skills to solving complex real-world problems.	—
175999	<b>Aerospace Engineering</b> Students will explore the designing, building, testing and analyzing science behind the forces and physical properties of planes, rockets and unmanned vehicles. They will utilize tools such as spreadsheets and sensing systems to collect and analyze data. Further, students will use technology to effectively solve real-world, challenging problems with business and industry partners. Lastly, students will explore the future of the aerospace industry.	—
175006	<b>Computer Aided Drafting and Modeling Integrated Manufacturing</b> In this course students will be introduced to all aspects of computer integrated manufacturing. They will learn about robotics and automation, manufacturing processes, computer modeling, manufacturing equipment, and flexible manufacturing systems.	—

Subject Code	Description	Core Subject Area (for proper cert)
175008	<del>Mechanical Engineering</del> <b>Mechanisms and Drives</b> Students will learn the principles and practices of machine operation and machine applications. They <del>will learn</del> will learn how machine components such as gears, belts, sprockets, bearings, clutches, couplings, springs, etc. contribute to the application for which the machine is designed. They will also examine the basic drives of such mechanisms as electric motors and hydraulic & pneumatic actuators.	—
<u>176060</u>	<u><b>Battery Technology</b></u> <u>Students examine battery technology with a focus on design, function, and manufacturing. They explore battery chemistries, energy storage principles, and performance factors such as capacity, efficiency, and lifespan. Students study battery production processes, materials, and environmental impacts, while learning to test, select, and safely handle batteries for various applications. Emphasis is placed on emerging technologies, industry standards, and the critical role of batteries in modern electrical and electronic systems.</u>	<u>—</u>
<u>176065</u>	<u><b>Aerospace Engineering and Design</b></u> <u>Students build foundational skills in space systems engineering through the study of rocketry, orbital mechanics, and the evolution of spaceflight. They design, test, and analyze rockets using simulation tools, technical drawings, and physical models. Emphasis is placed on interpreting flight data, applying physics and math principles, and understanding mission planning.</u>	<u>—</u>

Table 30. Career Field 12: Information Technology Codes (14xxxx)

Subject Code	Description	Core Subject Area (for proper cert)
<del>145025</del>	<del><b>Computer Hardware</b></del> <del>Students will learn to install, repair, and troubleshoot computer hardware systems. They will perform preventative maintenance practices and learn techniques for maintaining computer hardware security. Communication skills and professionalism in troubleshooting situations will be emphasized.</del>	<del>—</del>
<del>145030</del>	<del><b>Computer Software</b></del> <del>Students will apply knowledge and skills of commercial and open source operating systems in portable, stand alone, and networked devices. Students will install a variety of operating systems manually and using remote assistance. They will learn to configure, modify, and troubleshoot operating systems. Desktop virtualization, system security, and operating system history will be addressed.</del>	<del>—</del>
<del>145040</del>	<del><b>Network Operating Systems</b></del> <del>Students will perform desktop client administrator duties by providing support for users in various work environments including professional offices, small businesses, work groups, departments, and/or corporate information services (IS). Students will learn to install, configure, and update commercial and open source network operating systems.</del>	<del>—</del>

Subject Code	Description	Core Subject Area (for proper cert)
<del>145055</del>	<del><b>Routing and Switching</b> Student will learn the functions, characteristics, and operations of routers and switches. Students will learn about wireless network standards and components and the role that routers play in enabling communications across multiple networks. Students will troubleshoot the routing process. Students will examine the use of Virtual Local Area Networks (VLANs) to create logically separate networks.</del>	<del>—</del>
<del>145999</del>	<del><b>Integrated Production Technologies</b> Students will engage in using innovative industry driven technologies to imagine and design new and improved products. Additionally, students will be introduced to entry-level jobs leading to challenging, high-paying careers. Students will build and maintain cyber-mechanical systems; invent unmanned exploration vehicles; apply electrical and mechanical engineering principles to the construction of production systems; and use logistics to develop solutions to the modern world's most pressing needs and wants.</del>	<del>—</del>

Table 32. Career Field 14: Manufacturing Technologies Codes (17xxxx)

Subject Code	Description	Core Subject Area (for proper cert)
<del>176010</del>	<del><b>Principles of Manufacturing</b> Students will apply knowledge and skills required in the application of standard manufacturing practices including planning, design, and visualization. Students will learn and apply skills related to interpreting drawings, creating documentation and performing measurements. Additionally, students will use principles and techniques of Computer Numerical Control (CNC), employ scheduling, and project evaluation.</del>	<del>—</del>
176007	<b>CNC Programming and Machining</b> <del>Computer Numerical Control Technology with Industrial Mills and Lathes</del> In this course students will use computer numerical control (CNC) programming to mill products comprised of various materials. Students will prepare numerical control programs in positioning systems using standard industrial G and M codes. They will program computerized numerical control mills and lathes.	—
<u>176055</u>	<b>Automation Technologies</b> <u>Students develop skills in automating manufacturing processes through the integration of robotics, programmable logic controllers (PLCs), and control systems. They design, program, and troubleshoot automated work cells using schematics, blueprints, and simulation software. Emphasis is placed on optimizing robotic operations, configuring sensors and actuators, and improving system efficiency. Learners apply automation tools to streamline production, monitor data for continuous improvement, and ensure safe, high-performance manufacturing environments.</u>	<u>—</u>

Subject Code	Description	Core Subject Area (for proper cert)
<a href="#">176045</a>	<p><b><a href="#">Fluid Mechanics</a></b></p> <p><a href="#">Students will explore the operation, installation, and maintenance of mechanical, hydraulic, pneumatic, and pumping systems used in manufacturing. Emphasis is placed on motors, drives, schematics, and fluid power systems. Learners will analyze schematics, calculate performance metrics, and troubleshoot real-world issues. Safety practices, personal protective equipment, and regulatory compliance are integrated throughout to prepare students for safe, effective work in modern engineering and industrial environments.</a></p>	=
<a href="#">176050</a>	<p><b><a href="#">Manufacturing Processes</a></b></p> <p><a href="#">Students develop foundational skills in manufacturing by exploring a variety of production methods and processes. Through hands-on learning and technical analysis, they gain knowledge in areas such as material selection, subtractive &amp; additive manufacturing, and advanced production techniques (semiconductor and battery production). Learners also develop the basic necessary skills to be prepared for a career in manufacturing such as safety measures, print reading, quality control, and measurement &amp; interpretation.</a></p>	=

Table 35. Career Field 18: Energy Codes (40xxxx)

<a href="#">Subject Code</a>	<a href="#">Description</a>	<a href="#">Core Subject Area (for proper cert)</a>
<a href="#">400010</a>	<p><b><a href="#">Energy Capstone</a></b></p> <p><a href="#">Students apply Energy pathway knowledge and skills in a more comprehensive and authentic way. Capstones are project/problem-based learning opportunities that occur both in and away from school. Under supervision of the school and through partnerships, students combine classroom learning with work experience to benefit themselves and others. These can take the form of mentorship employment, cooperative education, and internships.</a></p>	=
<a href="#">010710</a>	<p><b><a href="#">Natural Resources</a></b></p> <p><a href="#">Students will apply science principles and management practices to the protection of renewable and non-renewable natural resources. Students will learn fundamentals of land use as well as watershed, wildlife, fishery and forest management. Furthermore, students will learn management practices related to managing air and water quality along with requirements for managing solid and liquid waste. Throughout the course, students will apply communications, business principles and leadership skills.</a></p>	=

010715	<p><b><u>Energy Systems Management</u></b>  <u>Students will apply basic principles of energy accounting, thermodynamics and heat transfer, energy conversion and efficiency to heating, power generation and transportation. Students will apply the principles and practices needed for managing both renewable and non-renewable energy sources including, solar thermal, hydrogen generation, photovoltaic, hydroelectric, biomass use, geothermal heat transfer, and fossil fuel. Future energy systems and energy use scenarios are investigated, with a focus on promoting the use of renewable energy resources and technologies.</u></p>	==
010716	<p><b><u>Bio Energy</u></b>  <u>Students are introduced to the scientific and technical processes of biofuel/bio-energy production. Learners will evaluate the energy conversion process and methods for optimizing the fermentation process. Students will identify the systems and components employed by fermentation systems and communicate safe handling techniques of equipment, biomass, effluent and biogas. A focus will be given to environmental impacts, life-cycle analysis, and economic analysis of bioenergy production.</u></p>	==
010717	<p><b><u>Solar and Wind Energy</u></b>  <u>Students will specify system options by conducting Energy Site Assessments by using and interpreting resource maps, performance data, zoning requirements and interferences, installation timelines and price. Students will read plans, lay out components and assemble electrical systems. Students will perform system checkouts and interpret results from mechanical and electrical diagnostic reports and compile and maintain system records. Students will apply safety regulations and requirements and identify and mitigate public safety issues during system installations.</u></p>	==
010718	<p><b><u>Oil and Gas Operations</u></b>  <u>Students will develop the skills applicable to careers in petroleum, natural gas and coal industries. They will learn practices related to exploration, leasing, surveying, drilling, geophysical logging and completion process. Students will be familiar with wellhead and surface production equipment and interpret production histories and graphs. Students will learn sampling, analysis, monitoring and control techniques for effective environmental management in the extractive industries and the principals of metering, sales and marketing.</u></p>	==
010725	<p><b><u>Environmental Systems Management</u></b>  <u>Learners will analyze and interpret biological, chemical and physical properties of soil, water and air. They will determine the source and type of environmental contamination, evaluate pollution control measures and be prepared to respond accordingly. Learners will be able to monitor treatment processes for potable water, waste water and solid waste. Learners will develop and implement environmental plans using principles governing ecosystems in relation to resource development and industrial processes.</u></p>	==

<p><u>010730</u></p>	<p><b><u>Forestry and Woodland Ecosystems</u></b>  <u>Learners will apply principles of botany, dendrology and silviculture to the management of forests and forest ecosystems. Learners will apply principles of timber cruising with surveying and mapping techniques to take forest measurements. Learners will develop the knowledge and skills necessary for forest reforestation, timber stand improvement, timber harvesting and forest product utilization. Learners will operate and maintain forestry equipment, apply fire management practices, and understand related regulations, laws, and policy issues.</u></p>	<p>==</p>
<p><u>010735</u></p>	<p><b><u>Park and Recreational Management</u></b>  <u>Students will design facilities, develop educational programs and manage resources for use in public recreation. Students will maintain and operate equipment for maintaining wildlife habitat and supporting a variety of public recreational activities. Students will develop marketing and programming skills for park development, apply management practices to park operations and learn the systems required to maintain public safety.</u></p>	<p>==</p>
<p><u>010740</u></p>	<p><b><u>Urban Forestry</u></b>  <u>The learner will promote the care and management of trees for residential and commercial purposes. Learners will apply principles of soil management, dendrology and pest management to the care and management of trees. Learners will analyze budgets; and develop short and long-range management plans that balance environmental and economic goals and that support sustainable land use patterns. Principles of rigging, advanced rope techniques, and chainsaw applications for tree pruning and removal will be learned.</u></p>	<p>==</p>
<p><u>010745</u></p>	<p><b><u>Wildlife and Fisheries</u></b>  <u>Learners will apply the principles and practices of resource conservation and management to fish and wildlife populations. Students learn to properly handle wild animals, principles of wildlife nutrition, inventory practices, water quality parameters and testing, and natural and artificial propagation. Learners will apply principles of facility design and layout for managing fish populations. Learners will research and evaluate the impacts of various land practices, legislation, and human activities on habitats and populations.</u></p>	<p>==</p>