

**TExES® Technology Education 6–12
 Curriculum Crosswalk**

Required Course Numbers											
Test Content Categories											
Domain I – Fundamentals of Technology Education											
Competency 001: <i>The Technology Education teacher demonstrates knowledge of the nature and philosophy of technology and technology education and the interactions between technology and society.</i>											
A. Demonstrates knowledge of general characteristics of technology (e.g., technology involves innovation and creativity, technology products and systems alter the natural world and are designed to solve problems, there are limitations to technology’s ability to solve problems, new technologies are built on previous technologies) and of the history and evolution of technology.											
B. Understands how factors (e.g., scientific advances, access to capital, market demand) affect the rate of technological development and how technology makes it possible for scientists to extend research and explore new phenomena.											
C. Understands how technological systems and subsystems interact to achieve common goals and understands the role of control mechanisms and redundancy in technological systems.											

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D. Identifies resources needed to develop and support a technological system, the properties of those resources, and how those resources are used in technological systems.											
E. Understands career opportunities, requirements, and expectations (e.g., teamwork, leadership, integrity, honesty) in technology and applies principles of career planning and skills for job seeking.											
F. Understands how ethical, economic, political, environmental and cultural considerations affect the development, selection and use of technologies.											
G. Understands how technology affects humans in various ways (e.g., effects on safety, comfort, choices, attitudes; positive and negative social, cultural, political and economic influences; connections between technology and various societal institutions) and understands the importance of having a technologically literate society.											
H. Understands the role of technology education in the world (e.g., how technology education helps students manage, use and understand technology; how technology education provides hands-on experience to students; the difference between technology education and career and workforce development education).											

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Competency 002: <i>The Technology Education teacher understands the design process and its application in technology.</i>											
A. Understands the steps in the design process and recognizes the design process as a systematic, iterative method of solving problems.											
B. Understands factors (e.g., human and personal characteristics, principles of ergonomics, meeting specific needs such as those of people with special needs) that influence a design and factors (e.g., efficiency, reliability, functionality) that influence the quality of a product.											
C. Knows how to describe, develop and analyze technological products and systems that incorporate quality, reliability and safety using the universal systems model (i.e., input, process, output, feedback) and appropriate design processes and techniques.											
D. Knows how to evaluate a design in terms of given criteria (e.g., functionality, aesthetics, marketability) and recognizes trade-offs associated with technology and the need for compromises among competing factors in the design process.											
E. Knows how to use a variety of models (e.g., physical, mathematical, computer) and other methods to develop optimal designs for technological products.											
F. Understands methods for communicating designs to others.											

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G. Identifies the chemical, mechanical and physical properties of materials.											
H. Applies mathematics, natural science and social science to analyze technology and applies processes and problem-solving methods (e.g., processes and methods from science, engineering, mathematics) to solve technological problems.											
Competency 003: <i>The Technology Education teacher demonstrates knowledge of the uses and impacts of technology and techniques for maintaining technology systems.</i>											
A. Understands how technology systems may be used to meet specific goals.											
B. Demonstrates knowledge of appropriate codes, laws, standards and regulations related to technology (e.g., Occupational Safety and Health Administration, American Society for Testing and Materials, Environmental Protection Agency, National Electrical Code).											
C. Identifies emerging technologies and their characteristics and recognizes their role in the evolution of technology.											
D. Knows how to collect, use and evaluate manuals, protocols and other resources to learn and understand how technologies function.											
E. Knows how to create maintenance plans and programs and recognizes the importance of proper maintenance and the consequences of improper maintenance.											

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F. Applies strategies and procedures for maintaining safe and proper functioning of tools, equipment and machines.											
G. Applies procedures for handling and storing tools and materials and for operating technological systems so that they function in the way they were designed.											
H. Knows how to troubleshoot technological systems and determine causes of failure in materials, tools, equipment and machines.											
I. Applies procedures for repairing systems that are malfunctioning.											
Competency 004: <i>The Technology Education teacher knows how to plan, produce and manage a technology systems project.</i>											
A. Understands how to plan, produce, and manage a communication project using appropriate resources, technical processes and the basic communication model.											
B. Understands how to plan, produce and manage a manufacturing project using appropriate resources and technical processes.											
C. Understands how to plan, produce, and manage a construction project using appropriate resources and technical processes.											
D. Understands how to plan, produce and manage an energy, power and transportation project using appropriate resources and technical processes.											

Required Course Numbers											
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E. Understands how to plan, produce, and manage a bio-related technology project using appropriate resources and technical processes.											
F. Understands how to plan, produce and manage a computer applications project using appropriate resources and technical processes.											
Competency 005: <i>The Technology Education teacher demonstrates knowledge of the philosophy of technology education; knows how to develop and implement a technology education program; and knows how to plan, manage and maintain technology education facilities.</i>											
A. Knows how to assess and prioritize the facility-related needs of a technology education program (e.g., solicit and evaluate input from stakeholders, ensure that the space and physical arrangement of instructional facilities are conducive to effective instruction).											
B. Identifies characteristics (including advantages and disadvantages) of a variety of layouts for instructional facilities.											
C. Applies procedures for ensuring that instructional facilities are accessible to individuals with special needs.											
D. Knows how to identify and use sources of information about regulations and guidelines (e.g., space requirements, environmental control, safety equipment) for the construction and use of instructional facilities in technology education.											

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E. Knows how to maintain instructional facilities for the technology education program and how to develop schedules for inspecting tools and equipment and for performing routine maintenance.											
F. Knows how to access information pertaining to the installation, maintenance and repair of equipment used in technology education facilities.											
G. Knows how to identify, select and acquire tools, equipment and materials (e.g., computer hardware and software, multimedia equipment, power tools) used in the technology education program.											
H. Understands methods of effective financial planning and management (e.g., identifying funding sources; procedures related to accounting, auditing, reporting and keeping inventory records).											
I. Demonstrates knowledge of methods and procedures for maintaining a safe instructional facility (e.g., identifying sources of safety-related information, evaluating safety hazards, maintaining a safe and clean learning environment, providing safety instruction) and for responding to emergencies (e.g., recognizing appropriate responses to given emergencies, identifying procedures for using safety equipment).											

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Domain II – Communication											
Competency 006: <i>The Technology Education teacher demonstrates knowledge of drafting.</i>											
A. Knows how to select and use tools and materials for sketching and for technical drawing.											
B. Applies technical drawing conventions to produce and interpret drawings (e.g., multiview drawings, sectional views, pictorial representations, detail and assembly drawings).											
C. Knows how to create working drawings, presentation drawings and models for residential, community, and business needs.											
D. Understands the use of scales and dimensioning skills in producing and interpreting technical drawings.											
E. Knows how to use software related to technical drawing.											
Competency 007: <i>The Technology Education teacher demonstrates knowledge of equipment and techniques used in graphic design, photography and image transfer and reproduction.</i>											
A. Understands principles (e.g., perspective, shading, balance, proportion, harmony), elements (e.g., line, form, color), and applications (e.g., architectural, engineering) of graphic design.											

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B. Demonstrates knowledge of equipment (e.g., input devices, output devices) and software (e.g., common characteristics of desktop publishing software, issues related to compatibility between software packages) used in desktop publishing.											
C. Demonstrates knowledge of skills (e.g., word processing, illustrating, layout) used in desktop publishing.											
D. Understands principles of photographic composition (e.g., lighting, perspective, focus) and how to select and use photographic equipment and materials.											
E. Applies techniques and processes related to photography (e.g., computer manipulation of images, product finishing processes).											
F. Knows how to select and use materials related to image transfer and reproduction.											
G. Understands techniques and processes related to image carrier preparation, transfer and reproduction.											
Competency 008: <i>The Technology Education teacher demonstrates knowledge of video and audio systems (e.g., radio, television), production techniques (e.g., recording, editing) and equipment (e.g., amplifiers, video cameras).</i>											
A. Demonstrates knowledge of equipment used in video and audio production (e.g., cameras, microphones, mixers, amplifiers, lighting equipment) and of how this equipment is interconnected in recording systems.											

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B. Understands skills and techniques used in video and audio recording.											
C. Understands skills used to manipulate video and audio files (e.g., video and audio editing techniques; file compression schemes; procedures for integrating video, audio, animation and special effects) and techniques for maintaining image and sound integrity during postproduction).											
Competency 009: <i>The Technology Education teacher demonstrates knowledge of electronic communication.</i>											
A. Understands scientific and technological concepts related to electronic communication.											
B. Demonstrates knowledge of materials and components used in electronic communication systems (e.g., satellite dishes, transmitters, receivers, uplinks, downlinks).											
C. Understands processes involved in electronic communication (e.g., how electromagnetic, satellite, and laser communication technologies send, transmit and receive messages).											

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Domain III – Manufacturing											
Competency 010: <i>The Technology Education teacher demonstrates knowledge of types of manufacturing systems and of the organization, structure and management of manufacturing enterprises.</i>											
A. Demonstrates knowledge of types of manufacturing systems (e.g., custom, repetitive).											
B. Identifies types of organizational structures used in manufacturing enterprises and their characteristics.											
C. Understands how workforce organization and management structure can influence technological development.											
Competency 011: <i>The Technology Education teacher demonstrates knowledge of the principles of product development and of the application of economic and marketing principles to manufacturing.</i>											
A. Understands marketing processes and techniques and their use in preparing a marketing plan for an idea, product, or service.											
B. Demonstrates knowledge of financial factors associated with starting and operating manufacturing enterprises.											
C. Understands how competition, economic investment, risk and the potential for economic reward influence the process of technological innovation and production.											

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D. Applies economic and marketing principles (e.g., cost-price relationships, supply and demand) to manufacturing.											
E. Demonstrates knowledge of principles of product development (e.g., design, prototype construction, testing).											
Competency 012: <i>The Technology Education teacher understands how to use tools and equipment in manufacturing.</i>											
A. Identifies types and characteristics of tools and equipment (e.g., micrometers, milling machines, lathes, jigs and fixtures, saws, drills, welding machines, computer numerical control machines) used in manufacturing.											
B. Knows how to use tools and equipment used in manufacturing.											
C. Knows how to maintain and adjust tools and equipment used in manufacturing.											
D. Understands safety issues related to the maintenance and use of tools and equipment used in manufacturing.											
Competency 013: <i>The Technology Education teacher demonstrates knowledge of materials used in manufacturing.</i>											
A. Identifies types and properties (e.g., elasticity, ductility, corrosion resistance) of raw materials used in manufacturing.											
B. Compares and contrasts the structure and properties of natural, synthetic and composite materials.											

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C. Knows how to select appropriate materials for a given manufacturing application.											
Competency 014: <i>The Technology Education teacher demonstrates knowledge of manufacturing processes and quality control procedures.</i>											
A. Demonstrates knowledge of processes used in manufacturing (e.g., casting, molding, forming, separating, conditioning, assembling, finishing).											
B. Demonstrates knowledge of the uses of automated systems (e.g., robotics, artificial intelligence, computer integrated manufacturing) in technology.											
C. Knows how to apply quality control procedures in manufacturing.											
Domain IV – Construction											
Competency 015: <i>The Technology Education teacher demonstrates knowledge of types of construction projects, procedures for planning, surveying and preparing sites for construction projects and postconstruction activities.</i>											
A. Identifies types (e.g., residential, civil, commercial) and characteristics of construction projects.											
B. Understands how to plan, produce and manage a construction systems project.											
C. Understands how to prepare a site for a construction project.											
D. Demonstrates knowledge of surveying tools and equipment and their uses.											

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E. Reads and interprets documents (e.g., survey reports, construction plans, zoning restrictions, building codes, environmental regulations) related to construction projects.											
F. Understands procedures related to postconstruction activities (e.g., site cleanup, waste disposal, landscaping) at a construction site.											
Competency 016: <i>The Technology Education teacher knows how to apply engineering principles to construction projects.</i>											
A. Identifies terms and concepts used in engineering.											
B. Applies engineering principles (e.g., tension, shear) to solve problems related to construction projects.											
C. Analyzes the structural properties of construction designs (e.g., truss, cantilever, arch, suspension).											
Competency 017: <i>The Technology Education teacher understands how to use hand and power tools in construction.</i>											
A. Identifies types and characteristics of measuring devices, hand tools and power tools and equipment (e.g., rules, saws, drills, levels, cranes, backhoes) used in construction.											
B. Knows how to use measuring devices, tools and equipment used in construction.											
C. Knows how to maintain and adjust tools and equipment used in construction.											

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D. Understands safety issues related to the maintenance and use of tools and equipment used in construction.											
E. Understands the safe and proper use of tools and equipment used in construction.											
Competency 018: <i>The Technology Education teacher demonstrates knowledge of construction materials and their properties.</i>											
A. Identifies types and properties (e.g., moisture content, strength, hardness, oxidation) of raw materials (e.g., wood, steel, concrete, masonry, glass) used in construction.											
B. Compares and contrasts the properties of materials used in construction.											
C. Knows how to select appropriate materials for a given construction application.											
Competency 019: <i>The Technology Education teacher demonstrates knowledge of skills and techniques used for building, maintaining and repairing structures.</i>											
A. Demonstrates knowledge of skills and techniques used for building structures.											
B. Demonstrates knowledge of skills and techniques used for maintaining and repairing structures.											
C. Demonstrates knowledge of skills and techniques related to framing (e.g., platform framing, post and beam) and roofing.											

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D. Demonstrates knowledge of subsystems (e.g., HVAC, plumbing, electrical) in construction projects.											
Domain V — Energy, Power and Transportation											
<i>Competency 020: The Technology Education teacher demonstrates knowledge of scientific concepts related to energy and power.</i>											
A. Identifies scientific concepts and principles (e.g., conservation of energy, mechanical advantage, Pascal's principle, Bernoulli's principle) related to energy and power.											
B. Identifies types of energy (e.g., chemical, electrical) and methods of converting one form of energy to another (e.g., gas turbine, internal combustion engine, photovoltaic cell).											
C. Applies concepts and units of force, work, energy and power to solve problems in technology.											
D. Applies scientific concepts and principles to solve problems related to energy, power and transportation systems.											
<i>Competency 021: The Technology Education teacher understands issues related to energy consumption and conservation.</i>											
A. Identifies sources, availability and uses of renewable (e.g., solar, wind) and nonrenewable (e.g., coal, oil) energy.											

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B. Understands issues (e.g., consumer choices, costs, impact on the environment) related to conserving natural resources and promoting sustainable development through techniques such as reusing, reducing and recycling.											
C. Demonstrates knowledge of processes used in extraction, production, transportation and storage of energy resources.											
Competency 022: <i>The Technology Education teacher understands characteristics of thermal, electrical, fluid and mechanical power systems and methods of control, transmission and storage of energy and power.</i>											
A. Identifies characteristics of thermal, electrical, fluid and mechanical power systems.											
B. Demonstrates knowledge of methods of control, transmission and storage of energy and power (e.g., pneumatic and hydraulic systems, flywheels, batteries, dams).											
C. Analyzes the design of thermal, electrical, fluid and mechanical power systems and recognizes advantages and disadvantages of systems designed for given functions.											
D. Understands the role of mechanical parts such as levers, cams, gear trains, belts and pulleys in controlling and transmitting power.											

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Competency 023: <i>The Technology Education teacher demonstrates knowledge of principles and applications of electronics.</i>											
A. Identifies types and characteristics of basic electronic components (e.g., resistors, inductors, transistors).											
B. Interprets schematic diagrams (e.g., determines function of a given circuit, determines the role of components in circuits) of AC and DC circuits and of analog and digital circuits.											
C. Analyzes voltage, resistance, current and power in series and parallel AC and DC circuits.											
D. Relates the operating principles of motors, meters, transformers and generators to basic principles of electricity and magnetism.											
Competency 024: <i>The Technology Education teacher demonstrates knowledge of the design and use of vehicles and vehicular subsystems and the characteristics of land, air, water and space transportation systems.</i>											
A. Identifies the characteristics of land, air, water and space transportation systems and their economic, safety and environmental impacts.											
B. Demonstrates knowledge of issues related to the design and use of vehicles (e.g., airplanes, trains, automobiles) and vehicular subsystems (e.g., powertrains, suspensions).											

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Test Content Categories											
C. Understands aerodynamic principles related to the design of transportation vehicles.											
Domain VI – Biotechnology and Computer Technology											
<i>Competency 025: The Technology Education teacher understands the role of biotechnology in business, industry and society s.</i>											
A. Demonstrates knowledge of applications of bio-related technologies in business and industry.											
B. Demonstrates knowledge of ethical and legal considerations associated with the selection, development and use of bio-related technologies, including emerging and innovative technologies.											
C. Identifies the intended and unintended effects of bio-related technology (e.g., effect of hazardous waste on the environment, social and economic effects of bio-related technologies) and strategies for assessing risks and benefits of bio-related technologies.											
<i>Competency 026: The Technology Education teacher demonstrates knowledge of principles of bio-related technologies.</i>											
A. Understands the scientific principles of bio-related technologies.											
B. Demonstrates knowledge of principles and methods used in environmental engineering.											

Required Course Numbers											
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C. Understands issues related to renewable and nonrenewable resources.											
D. Demonstrates knowledge of tools, equipment and materials used in bio-related technologies.											
Competency 027: <i>The Technology Education teacher demonstrates knowledge of basic principles related to computer technology.</i>											
A. Identifies types, characteristics and functions of computer hardware (e.g., server, router, video card, hub, modem), software applications (e.g., spreadsheets, firewall software, database management software, FTP client) and operating systems.											
B. Understands basic concepts of computer network architecture (e.g., LAN, WAN, Internet) and principles of data transfer within and between computer networks (e.g., role of network protocols such as TCP/IP).											
C. Knows how to perform routine installation, maintenance and troubleshooting procedures for stand-alone computers and computer networks.											
D. Understands the role of computer programs and computer languages in computer technology.											

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Competency 028: <i>The Technology Education teacher understands appropriate and effective uses of computer technology.</i>											
A. Understands computer system requirements for given applications.											
B. Identifies characteristics and uses of a variety of computer software applications (e.g., productivity, graphic design, modeling, multimedia, authoring).											
C. Demonstrates knowledge of issues (e.g., ethical, legal, commercial, privacy) related to security (e.g., use of firewalls and virus-protection software, passwords and log on procedures and protocols) and the use of computer technology to transfer and access information.											