

## Kansas Licensure Standards for Technology Education Educators

**\*\*Learner(s) is defined as children including those with disabilities or exceptionalities, who are gifted, and students who represent diversity based on ethnicity, race, socioeconomic status, gender, language, religion, and geographic origin.**

<b>Standard 1: Content Knowledge. The teacher of technology and engineering education demonstrates an understanding of the nature of technology and its relationship to society.</b>	
<b>Function 1: The teacher demonstrates an understanding of the nature of technology.</b>	
<b>Content Knowledge (CK)</b>	<b>Professional Skills (PS)</b>
1.1.1 CK The teacher understands technology and engineering education, technological literacy, and the characteristics and scope of technology—its role in human adaptation to the natural world, its development, direction, commercialization, and rate of growth.	1.1.4 PS The teacher communicates solutions verbally or by constructing physical, graphic, or mathematical models.
1.1.2 CK The teacher understands the core concepts of technology—systems, resources, requirements, optimization and tradeoffs, processes, and controls.	1.1.5 PS The teacher applies mathematical and scientific principles as they relate to technological systems.
1.1.3 CK The teacher understands the relationships among technologies and the influences and connections between science, technology, engineering, and mathematics (i.e. STEM) –integration, interactions, interrelationships, technological development, technology transfer, invention and innovation, knowledge protection and patents, and advancements.	1.1.6 PS The teacher applies knowledge and skills regarding diverse technological systems to solve practical problems.
	1.1.7 PS The teacher develops and uses curricula that encourage students to see, question, and interpret technological ideas from diverse perspectives.
<b>Function 2: The teacher demonstrates an understanding of technology and its relationship to society.</b>	
<b>Content Knowledge (CK)</b>	<b>Professional Skills (PS)</b>
1.2.1 CK The teacher has knowledge of the cultural, social, economic, and political effects of technology, including impacts and consequences, ethical issues, influences and changes resulting from technology; especially on social institutions such as the family and the political system.	1.2.6 PS The teacher identifies the positive and negative effects of technology on the individual, society, and the environment.
1.2.2 CK The teacher understands the effects of technology on the environment, including good and bad effects, and ways to decrease the negative environmental impact of technological systems and processes (e.g. by reducing resource inputs, reducing waste, recycling), and knows how to evaluate trade-offs with respect to different approaches.	1.2.7 PS The teacher creates activities that clarify the relationship between technology, society, and the environment.
1.2.3 CK The teacher understands the role of society and how various factors (e.g. marketing, economics, environment) affect invention, innovation, technology development and use of technology, including society’s needs and wants, its values and interests, and its demands and acceptance of technology.	1.2.8 PS The teacher develops and uses technology-based activities to help students understand technology as a knowledge base that is historical, current, and futuristic in nature.

1.2.4 CK The teacher understands critical changes in technology and its influence throughout the different periods of human history (e.g. the Iron Age, the Industrial Revolution, and the Information Age).	
1.2.5 CK The teacher understands the influence that significant technological innovations have had on human history and on today's world and can use past and present technological developments to discover trends and to predict possible future developments and their effects.	

<b>Standard 2: Content Knowledge: The teacher of technology and engineering education demonstrates an understanding of design, engineering, and problem solving.</b>	
<b>Function 1: The teacher demonstrates an understanding of design, engineering, and problem solving.</b>	
<b>Content Knowledge (CK)</b>	<b>Professional Skills (PS)</b>
2.1.1 CK The teacher understands the attributes of design—implementing the steps of the design process, design requirements, and use of designing product and system development.	2.1.9 PS The teacher uses the problem solving method to solve problems.
2.1.2 CK The teacher understands the engineering design process.	2.1.10 PS The teacher applies engineering design procedures and principles to design problems.
2.1.3 CK The teacher understands the attributes of the problem solving model.	2.1.11 PS The teacher is able to sketch solutions, make technical drawings, and use CAD (computer-aided design or computer-assisted design) to create two- and three-dimensional drawings.
2.1.4 CK The teacher knows how to select and use tools in a design process including the creation, testing, evaluation, and communication of solutions.	2.1.12 PS The teacher constructs a model or prototype of a product or system and makes necessary adjustments.
2.1.5 CK The teacher understands how to organize and communicate the solution to a design problem.	2.1.13 PS The teacher is able to test and evaluate designs in relation to pre-established criteria and constraints, using conceptual, physical, and/or mathematical models at various intervals of the design process in order to check design, note potential improvements, and redefine as needed.
2.1.6 CK The teacher understands systems thinking (i.e. input, process, output, feedback) and knows how to model it for students.	2.1.14 PS The teacher documents the design process by developing a portfolio to illustrate the process used to design a solution to a given problem.
2.1.7 CK The teacher knows how to apply the design process to systems and problems in power and energy, transportation, communication technologies, manufacturing, and construction.	2.1.15 PS The teacher evaluates and communicates through presentation the observations, processes, and results of the entire design process.
2.1.8 CK The teacher knows how to operate, maintain, and troubleshoot technological systems.	

**Standard 3: Content Knowledge: The teacher of technology and engineering education demonstrates an understanding of the systems of the designed world, the knowledge and skills needed in a technological world, and the career fields associated with it.**

**Function 1: The teacher of technology and engineering education demonstrates an understanding of the systems of the designed world, the knowledge and skills needed in a technological world, and the career fields associated with it.**

<b>Content Knowledge (CK)</b>	<b>Professional Skills (PS)</b>
3.1.1 CK The teacher understands and can teach the concepts and systems associated with technologies of the designed world.	3.1.6 PS The teacher troubleshoots, analyzes, and maintains systems to ensure their safe, proper, and precise function.
3.1.2 CK The teacher understands the concepts of integrating science, technology, engineering, and mathematics to solve problems and find solutions in the technological world.	3.1.7 PS The teacher uses appropriate technologies and processes to access, retrieve, organize, process, maintain, interpret, and evaluate information in order to communicate ideas and findings.
3.1.3 CK The teacher understands, develops, and reinforces the qualities of an effective worker in today’s technological world.	3.1.8 PS The teacher integrates science, technology, engineering, and mathematics into the technology and engineering education classroom.
3.1.4 CK The teacher can describe and differentiate between the major types of careers and professionals associated with technology, including engineers, engineering technologists, industrial technologists, technicians, and craftsman.	3.1.9 PS The teacher integrates lessons and provides students with opportunities relating to careers in the technological world.
3.1.5 CK The teacher understands and can teach the concepts and systems associated with technologies of the designed world including: a. Medical technologies b. Agricultural and bio-related technologies c. Energy, power, and transportation technologies d. Information and communication technologies e. Production technologies—manufacturing and construction technologies	

**Standard 4: Content Knowledge.** The teacher of technology and engineering education demonstrates an understanding of knowledge and applications of major concepts, principles, theories, and systems associated with energy, power, and transportation technologies.

**Function 1: The teacher demonstrates an understanding of knowledge and applications of major concepts, principles, theories, and systems associated with energy and power technologies.**

<b>Content Knowledge (CK)</b>	<b>Professional Skills (PS)</b>
4.1.1 CK The teacher knows how to apply mathematical and scientific principles to solve problems involving the harnessing, transfer, loss, transmission, and conversion of power and energy.	4.1.8 PS The teacher is able to develop and solve energy and power system problems and document the solutions.
4.1.2 CK The teacher understands energy utilization systems (e.g. internal combustion, external combustion, electric motors, hybrid systems).	
4.1.3 CK The teacher understands different forms of energy (e.g. mechanical, electrical, thermal, chemical, nuclear, etc.) and the differences between them.	
4.1.4 CK The teacher understands the relationship between energy, power, and transportation technologies.	
4.1.5 CK The teacher knows how energy is classified, measured, and controlled.	
4.1.6 CK The teacher knows how to apply concepts of power and energy to solve problems related to them.	
4.1.7 CK The teacher understands safety rules and regulations associated with energy and power technologies.	

**Function 2: The teacher demonstrates an understanding of knowledge and applications of major concepts and systems associated with transportation technologies.**

<b>Content Knowledge (CK)</b>	<b>Professional Skills (PS)</b>
4.2.1 CK The teacher knows the inputs used in transportation systems (e.g. capital, materials, time, people).	4.2.5 PS The teacher is able to develop and produce a transportation product or system and document the solution.
4.2.2 CK The teacher understands the components of transportation vehicles and support systems; including infrastructures and subsystems for propulsion, suspension, control, and guidance.	
4.2.3 CK The teacher understands the different processes and systems involved in transportation operations (e.g. receiving, storing, loading, moving, unloading), along with the role each process plays in the efficiency of the overall system.	
4.2.4 CK The teacher understands safety rules and regulations associated with transportation technologies.	

**Standard 5: Content Knowledge. The teacher of technology and engineering education demonstrates an understanding of knowledge and applications of major concepts, principles, theories, and systems associated with information and communication technologies.**

**Function 1: The teacher demonstrates an understanding of knowledge and applications of major concepts, principles, theories, and systems associated with information and communication technologies.**

<b>Content Knowledge (CK)</b>	<b>Professional Skills (PS)</b>
5.1.1 CK The teacher understands major concepts, principles, and terminology related to information systems.	5.1.14 PS The teacher uses computers and calculations to access, retrieve, organize, process, maintain, interpret, and evaluate information in order to communicate.
5.1.2 CK The teacher knows how to use the problem solving process to identify appropriate tools and materials to address communication problems.	5.1.15 PS The teacher uses communication systems equipment including photography, printing, technical drawing, electronic communication, telecommunication, digital imaging, and computer technology.
5.1.3 CK The teacher understands operating systems, software applications, communication devices, and networking components in the information or communication technology classroom/laboratory.	5.1.16 PS The teacher integrates math and science applications into information and communication technology activities.
5.1.4 CK The teacher recognizes the various types of network structures (e.g. LAN, MAN, WAN) currently used.	
5.1.5 CK The teacher understands the concepts that make up the communication systems model.	
5.1.6 CK The teacher understands concepts, terminology, and processes related to audio, video, electronic, telecommunications, data, technical, photographic, computer technologies, and graphic communications as applied to communication systems.	
5.1.7 CK The teacher knows how to design and plan an effective message for a given communication system.	
5.1.8 CK The teacher knows the impacts of communication technology and media on society and culture.	
5.1.9 CK The teacher understands legal and ethical issues regarding the use of communication and information technologies (e.g. copyright, privacy, security).	
5.1.10 CK The teacher knows issues and trends in information and communication technologies.	
5.1.11 CK The teacher knows how to evaluate, use, and maintain communication products and systems.	
5.1.12 CK The teacher knows how to apply mathematical and scientific principles to solve problems related to information and communication technology.	
5.1.13 CK The teacher understands safety rules and regulations associated with information and communication technologies.	

<b>Standard 6: Content Knowledge: The teacher of technology and engineering education demonstrates an understanding of knowledge and applications of major concepts, principles, theories, and systems associated with production technologies (manufacturing and construction).</b>	
<b>Function 1: The teacher demonstrates an understanding of the knowledge and application of production technologies.</b>	
<b>Content Knowledge (CK)</b>	<b>Professional Skills (PS)</b>
6.1.1 CK The teacher knows how to apply the universal systems model to manufacturing and construction processes.	6.1.10 PS The teacher knows how to use, assess, and maintain production technology products and systems.
6.1.2 CK The teacher understands the gathering processes associated with harvesting, drilling, and mining to obtain raw materials and their conversion into standard stock material suitable for production.	6.1.11 PS The teacher demonstrates safe practices and procedures associated with the secondary processing of materials into products and/or structures.
6.1.3 CK The teacher understands and knows how to integrate math and science concepts such as static and dynamic loads and how they produce forces (e.g. compression, tension, torsion) that affect stability and failure in a structure.	6.1.12 PS The teacher creates and maintains a safe laboratory environment reflecting state and national program standards for production technology.
6.1.4 CK The teacher understands the relationship of manufacturing and construction to other technologies, industry, and society.	6.1.13 PS The teacher develops, implements, and maintains a safety plan that includes orientation of all students to safety practices and documentation of their performance, evaluation of facilities and recommendations for improvement, and communicates the value and performance of prudent safety practices.
6.1.5 CK The teacher understands industrial safety rules and regulations associated with production technology.	6.1.14 PS The teacher develops, uses, and maintains a system for equipment maintenance, ordering of laboratory equipment and supplies, and providing for safe and orderly materials handling and storage.
6.1.6 CK The teacher knows how to operate, maintain, and organize production technology equipment in a technology and engineering education laboratory.	6.1.15 PS The teacher integrates science, technology, engineering, and math concepts into the production technologies.
6.1.7 CK The teacher understands safety procedures related to tools, equipment, materials, processes, and environmental factors found in the production technology learning environments.	6.1.16 PS The teacher develops and implements public relations strategies to promote production technology in technology and engineering education.
6.1.8 CK The teacher understands state and federal laws, liability issues and legal responsibilities relating to safety in the production technology learning environment.	
6.1.9 CK The teacher knows how to use public relations strategies to promote production technology.	
<b>Function 2: The teacher demonstrates an understanding of the knowledge and application of manufacturing technologies.</b>	
6.2.1 CK The teacher understands the components of a manufacturing system associated with enterprise, research and development, finance, production planning, production, quality control, and marketing.	6.2.6 PS The teacher instructs students to design a product, design and build tooling, sequence operations, and produce the product.

6.2.2 CK The teacher knows the key concepts and historical developments associated with the efficiency of production.	6.2.7 PS The teacher instructs students to successfully organize and manage a manufacturing enterprise, including the research and development, financing, production planning, production, quality control, and marketing of a product.
6.2.3 CK The teacher understands the differences between manufacturing systems that involve mass production (e.g. flexible, continuous, batch, custom production).	
6.2.4 CK The teacher knows the variety and properties of materials used in the manufacture of products and can use selection criteria and information to determine the best material for manufacturing purposes.	
6.2.5 CK The teacher knows the secondary processing methods of converting standard stock industrial materials into finished products (e.g. casting and molding, forming, assembling).	
<b>Function 3: The teacher demonstrates an understanding of the knowledge and application of construction technologies.</b>	
6.3.1 CK The teacher understands the components of a construction system associated with enterprise, research and development, finance, production planning, production, quality control, and marketing.	6.3.7 PS The teacher instructs students to successfully organize and manage the construction of a structure, including scheduling, site preparation, building major structural elements, utilities installation, finishing the structure and site, servicing, and selling.
6.3.2 CK The teacher understands the key concepts, processes, and terminology related to construction.	
6.3.3 CK The teacher knows the variety and properties of materials used in the construction of structures and can evaluate the suitability of material based on selection criteria and specifications for a given construction project.	
6.3.4 CK The teacher understands the numerous constraints on structural designs, such as building codes, cost, and function associated with construction.	
6.3.5 CK The teacher knows the systems and subsystems of buildings and structures and the functions they perform in residential, commercial, and civil types of construction.	
6.3.6 CK The teacher understands the variety of processes used in construction, including on-site and prefabricated techniques for residential, commercial, and civil types of construction.	

**Standard 7: Instructional Practice. The teacher of technology and engineering education demonstrates an understanding of organization, maintenance and management, safety and laboratory practices associated with teaching technology and engineering education.**

**Function 1: The teacher demonstrates an understanding of organization, maintenance and management, safety and laboratory practices associated with teaching technology and engineering education.**

Content Knowledge	Professional Skills
7.1.1 CK The teacher demonstrates knowledge, including the application of computers and media related to the design, organization, and management of technology and engineering education facilities to accommodate current and future multidisciplinary activities and project-based learning.	7.1.7 PS The teacher creates and maintains a safe laboratory environment that reflects state and national program standards for technology and engineering education.
7.1.2 CK The teacher knows how to design, conduct, manage, and assess laboratory/field experiences.	7.1.8 PS The teacher develops, uses, and maintains a system for equipment maintenance, ordering of laboratory equipment and supplies, and providing for safe and orderly materials handling and storage (e.g. material safety data sheets).
7.1.3 CK The teacher can operate and maintain technology and engineering education laboratory equipment.	7.1.9 PS The teacher develops, implements, and maintains a safety plan that includes orientation of all students to safety practices and documentation of their performance, evaluation of facilities and recommendations for improvement, and communicates the value and performance of prudent safety practices.
7.1.4 CK The teacher knows about general safety procedures related to tools, equipment, materials, and processes found in the technology and engineering education-learning environment.	7.1.10 PS The teacher organizes facilities to accommodate current/future multidisciplinary, project-based, and STEM learning activities.
7.1.5 CK The teacher understands state and federal laws, liability issues, and legal responsibilities relating to safety in the technology and engineering education learning environment.	
7.1.6 CK The teacher knows about the environmental factors contributing to the safety, health, and educational performance in the technology and engineering education learning environment (e.g. lighting, climate control, air quality, organization and placement of equipment).	

<b>Standard 8: Professional Responsibility: The teacher of technology and engineering education demonstrates an understanding of the profession, its curriculum, instructional practices for individual learners and learning, and college and career readiness practices for students.</b>	
<b>Function 1: The teacher demonstrates an understanding of the technology and engineering education profession.</b>	
<b>Content Knowledge (CK)</b>	<b>Professional Skills (PS)</b>
8.1.1 CK The teacher knows about the technology and engineering education professional organizations and educational opportunities.	8.1.4 PS The teacher participates in professional organizations associated with technology and engineering education—their publications, resources, and opportunities for professional development.
8.1.2 CK The teacher is aware of technology and engineering education related student organizations and their activities and opportunities for leadership development.	8.1.5 PS The teacher serves as an effective advisor to a technology and engineering student organization.
8.1.3 CK The teacher knows how to use public relations strategies to promote technology and engineering education.	8.1.6 PS The teacher develops and implements public relations strategies to promote technology and engineering education.
<b>Function 2: The teacher demonstrates an understanding of the technology and engineering education curriculum.</b>	
<b>Content Knowledge (CK)</b>	<b>Professional Skills (PS)</b>
8.2.1 CK The teacher understands the historical evolution of the discipline.	8.2.3 PS The teacher discusses, develops, and implements programs and curricular materials reflecting state and national curricular models for technology and engineering education and sequences courses appropriately to the developmental level of students.
8.2.2 CK The teacher understands the state and national curricular models for technology and engineering education and the sequencing of courses associated with the developmental level of students.	8.2.4 PS The teacher creates and uses interdisciplinary learning experiences allowing students to integrate knowledge, skills, and methods of inquiry from several subject areas focusing on the practical application of that knowledge.
<b>Function 3: The teacher demonstrates and understanding of the technology and engineering education instructional practices.</b>	
<b>Content Knowledge (CK)</b>	<b>Professional Skills (PS)</b>
8.3.1 CK The teacher understands educational principles and practices relating to technology and engineering education.	8.3.5 PS The teacher selects and uses appropriate instructional strategies and assessment practices in teaching various technology and engineering education programs.
8.3.2 CK The teacher knows about issues of equity, diversity, and special populations regarding the participation of all students in the technology and engineering education program.	8.3.6 PS The teacher is able to teach multidisciplinary activities and project-based learning.
8.3.3 CK The teacher knows the relationship of technology and engineering education concepts to other subject areas and to students' life experiences.	8.3.7 PS The teacher provides classroom and laboratory learning experiences in technology-related subjects that are appropriate for every student, regardless of gender, race, ethnicity, or special needs.
8.3.4 CK The teacher knows how to design, conduct, manage, and assess laboratory/field experiences related to technology and engineering education.	8.3.8 PS The teacher effectively uses appropriate educational or instructional technology to develop and present instructional material.

	8.3.9 PS The teacher facilitates the discovery of individual talents, aptitudes, interests, and potentials related to technology-based careers by providing “real world” learning opportunities.
<b>Function 4: The teacher demonstrates an understanding of college and career readiness practices in technology and engineering education.</b>	
8.4.1 CK The teacher knows the current knowledge, skills, and dispositions needed for success in post-secondary education, business, and/or industry.	8.4.4 PS The teacher provides students opportunities to develop the knowledge, skills, and dispositions necessary for success in post-secondary education, business, and/or industry.
8.4.2 CK The teacher is aware of local, state, and/or national practices for college and career readiness.	8.4.5 PS The teacher participates in local, state, and/or national initiatives for college and career readiness for all students.
8.4.3 CK The teacher is aware of current and future career opportunities in technology and engineering related fields.	8.4.6 PS The teacher communicates and provides students with experiences to learn about future education and career opportunities.