

COMPETENCIES FOR SECONDARY TEACHERS: INDUSTRIAL TECHNOLOGY GRADES 7-12



In addition to the Arkansas Teaching Standards (ATS) and the competencies for the Teacher Excellence and Support System (TESS), including competencies regarding the knowledge and use of educational technology that reflect the International Society for Technology in Education standards, the teacher of Industrial Technology, grades 7-12, shall also demonstrate knowledge and competencies in the following areas:

1. TECHNOLOGY AND SOCIETY

AR Engineering and Technology Education Frameworks:

Introduction to ETE Units 1-2
Fundamentals of ETE Unit 1
Design Applications I Unit 1
Design Applications II Unit 2

ITEEA STLs: Standards 1-7

- 1.1 Ability to understand the nature of technology, technology and engineering education, and technological literacy
- 1.2 Ability to understand how technology influences culture and history
- 1.3 Ability to understand the impacts of technology on family, social institutions, and the political system
- 1.4 Ability to understand how technology effects various factors (marketing, economics, environment) to influence technological development and innovation
- 1.5 Ability to understand the environmental impact of technological systems and processes
- 1.6 Ability to understand the relationship between science, technology, engineering, and mathematics

2. TECHNOLOGICAL DESIGN AND PROBLEM SOLVING

AR Engineering and Technology Education Frameworks:

Introduction to ETE Units 2-6
Fundamentals of ETE Unit 1-5
Design Applications I Unit 1-2
Design Applications II Unit 1-2

ITEEA STLs: Standards 8-13

- 2.1 Ability to understand the engineering design process by
 - Identifying the problem and define design criteria and constraints
 - Generating possible solutions, select, develop, and refine design proposals using analysis and creativity
 - Evaluating, testing, and optimizing designs, using specifications, design principles, modeling, experimentation, and prototyping
 - Implementing, documenting, and presenting the solution to a design problem
- 2.2 Ability to understand the relationship between technology and engineering
- 2.3 Ability to understand how to select the tools, materials, and processes used in the engineering design process
- 2.4 Ability to understand how to apply the engineering design process to systems and problems related to
 - energy, power, and transportation technologies
 - information and communications technologies
 - manufacturing and construction technologies
- 2.5 Ability to understand systems thinking and how to safely operate, maintain, and troubleshoot technological systems

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3. ENERGY, POWER, AND TRANSPORTATION

AR Engineering and Technology Education
Frameworks:
Introduction to ETE Unit 6
Fundamentals of ETE Unit 5
Design Applications II Unit 1

ITEEA STLs: Standards 11, 16, & 18

- 3.1 Ability to understand the various forms of energy and the relationship between energy, power, and work
- 3.2 Ability to understand and apply safety practices related to working with energy and power technologies
- 3.3 Ability to understand how energy and power are generated, measured, and controlled
- 3.4 Ability to understand the different processes involved in transportation systems and technologies
- 3.5 Ability to understand and apply safety practices related to working with transportation technologies
- 3.6 Ability to understand the components of vehicles and support systems including
 - Propulsion
 - Suspension
 - Control and guidance
- 3.7 Ability to understand how to apply mathematical and scientific principles related to energy, power, and transportation technologies
- 3.8 Ability to understand how to apply the concepts of energy, power, and transportation technologies to solve related problems

4. INFORMATION AND COMMUNICATION TECHNOLOGIES

AR Engineering and Technology Education
Frameworks:
Introduction to ETE Unit 3
Fundamentals of ETE Unit 2
Design Applications I Unit 2

ITEEA STLs: Standards 11 & 17

- 4.1 Ability to understand the major concepts and terminology related to information and communications technologies
- 4.2 Ability to understand information and communication technologies using a systems model that includes inputs, processes, and outputs
- 4.3 Ability to understand the impacts of information and communication technologies on media, society, and culture; including the legal and ethical issues
- 4.4 Ability to understand how to identify and apply the appropriate tools and materials to solving a problem related to information and communications
- 4.5 Ability to understand the importance of current issues and trends in information and communications technologies

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5. MANUFACTURING AND CONSTRUCTION TECHNOLOGIES

AR Engineering and Technology Education
Frameworks:

Introduction to ETE Units 4 & 5
Fundamentals of ETE Units 3 & 4
Design Applications I Unit 1
Design Applications II Unit 2

ITEEA STLs: Standards 19 & 20

- 5.1 Ability to understand the major concepts and terminology related to manufacturing and construction technologies
- 5.2 Ability to understand manufacturing and construction technologies using a systems model that includes inputs, processes, and outputs
- 5.3 Ability to understand the various tools, materials, and processes used in manufacturing and construction
- 5.4 Ability to understand the concepts of automated systems used in manufacturing and construction systems
- 5.5 Ability to understand the designs, specifications, costs, and functions used in manufacturing and construction
- 5.6 Ability to understand and apply industry safety practices related to working with manufacturing and construction technologies

6. PEDAGOGICAL AND PROFESSIONAL STUDIES

AR Engineering and Technology
Education Frameworks:

Introduction to ETE Unit 7
Fundamentals of ETE Unit 6
Design Applications I Unit 3
Design Applications II Unit 3

ITEEA STLs:
Standards 1-7

- 6.1 Ability to understand how to develop a project-based curriculum centered on state and national standards
- 6.2 Ability to understand how to choose, design, adapt, and implement instructional strategies that are central to the study of technology and engineering
- 6.3 Ability to understand how to operate, service, and maintain equipment in the technology and engineering laboratory
- 6.4 Ability to understand how to create a safe laboratory environment for students, including instruction in the appropriate practices and procedures in the use of tools, materials, and processes
- 6.5 Ability to understand how to evaluate and assess students, both formally and informally, in a project-based learning environment
- 6.6 Ability to understand the relationship between technology and engineering education, industry, and advisory committees
- 6.7 Ability to understand the relationship of classroom learning experiences and student organizations
- 6.8 Ability to understand the importance of personal professional development, including membership in professional associations and organizations
- 6.9 Ability to understand the impact of educational policy, funding, and legislation
- 6.10 Ability to understand the importance of collaboration with faculty across all subject areas to provide students with authentic, integrated learning experiences