



Field 018: Engineering and Technology Education Assessment Blueprint

Domain I—Foundations of Engineering and Technology

0001 Nature of Engineering and Technology (Standard 1)

0002 The Engineering Design Process (Standard 2)

Domain II—Energy, Power, and Communication Systems

0003 Energy Systems and Power Systems (Standard 3)

0004 Communication Systems (Standard 4)

Domain III—Manufacturing and Construction Systems

0005 Manufacturing Systems (Standard 6)

0006 Construction Systems (Standard 7)

Domain IV—Transportation, Biotechnology, and Medical Systems

0007 Transportation Systems (Standard 5)

0008 Biotechnology Systems and Medical Systems (Standard 8)

Domain V—Instruction and Assessment

0009 Instruction and Assessment in Engineering and Technology Education (Standard 9)

Domain	Objectives	Standards	Approximate Test Weight
I. Foundations of Engineering and Technology	0001–0002	1–2	30%
II. Energy, Power, and Communication Systems	0003–0004	3–4	20%
III. Manufacturing and Construction Systems	0005–0006	6–7	20%
IV. Transportation, Biotechnology, and Medical Systems	0007–0008	5, 8	20%
V. Instruction and Assessment	0009	9	10%

Standard 1: Nature of Engineering and Technology

Engineering and technology education teachers have a broad and comprehensive understanding of the historical, cultural, political, societal, and economic roles of engineering and technology, including:

- 1.1** the interrelationships among technology, science, mathematics, and engineering
- 1.2** the historical, cultural, political, societal, and economic contexts of engineering and technology
- 1.3** the effects of engineering and technology on the environment
- 1.4** the role of society and government in regulating and influencing engineering and technology
- 1.5** the role of business, business management, and professionalism in engineering and technology

Standard 2: The Engineering Design Process

Engineering and technology education teachers have a broad and comprehensive understanding of the characteristics of the engineering design process and its role in technology systems, including:

- 2.1** the systems model and steps in the engineering design process
- 2.2** applications of the engineering design process
- 2.3** troubleshooting technology systems
- 2.4** the role of research and development, innovation, and experimentation in technology systems
- 2.5** the role of quality control in technology systems

Standard 3: Energy Systems and Power Systems

Engineering and technology education teachers have a broad and comprehensive understanding of tools, equipment, materials, and procedures used in energy systems and power systems and the scientific and engineering principles underlying these systems, including:

- 3.1** principles of science and engineering in energy and power systems
- 3.2** tools, equipment, and materials used in energy and power systems
- 3.3** processes and procedures used in energy and power systems

Standard 4: Communication Systems

Engineering and technology education teachers have a broad and comprehensive understanding of tools, equipment, materials, and procedures used in communication systems and the scientific and engineering principles underlying these systems, including:

- 4.1** principles of science and engineering in communication systems
- 4.2** tools, equipment, and materials used in communication systems
- 4.3** processes and procedures used in communication systems

Standard 5: Transportation Systems

Engineering and technology education teachers have a broad and comprehensive understanding of tools, equipment, materials, and procedures used in transportation systems and the scientific and engineering principles underlying these systems, including:

- 5.1** principles of science and engineering in transportation systems
- 5.2** tools, equipment, and materials used in transportation systems
- 5.3** processes and procedures used in transportation systems

Standard 6: Manufacturing Systems

Engineering and technology education teachers have a broad and comprehensive understanding of tools, equipment, materials, and procedures used in manufacturing systems and the scientific and engineering principles underlying these systems, including:

- 6.1** principles of science and engineering in manufacturing systems
- 6.2** tools, equipment, and materials used in manufacturing systems
- 6.3** processes and procedures used in manufacturing systems

Standard 7: Construction Systems

Engineering and technology education teachers have a broad and comprehensive understanding of tools, equipment, materials, and procedures used in construction systems and the scientific and engineering principles underlying these systems, including:

- 7.1** principles of science and engineering in construction systems
- 7.2** tools, equipment, and materials used in construction systems
- 7.3** processes and procedures used in construction systems

Standard 8: Biotechnology Systems and Medical Systems

Engineering and technology education teachers have a broad and comprehensive understanding of the basic tools, equipment, materials, and procedures used in biotechnology systems and medical systems and the scientific and engineering principles underlying these systems, including:

- 8.1** principles of science and engineering in biotechnology systems and medical systems and in biotechnology and medical products
- 8.2** tools, equipment, and materials used in biotechnology systems and medical systems
- 8.3** processes and procedures used in biotechnology systems and medical systems
- 8.4** legal and ethical considerations in biotechnology systems and medical systems

Standard 9: Instruction and Assessment in Engineering and Technology Education

Engineering and technology education teachers have a broad and comprehensive understanding of content-specific instruction and assessment in engineering and technology education, including:

- 9.1** the Indiana Academic Standards for Technology Education
- 9.2** the ITEA/CTTE/NCATE Curriculum Standards and the ISTE National Educational Technology Standards
- 9.3** instructional strategies and resources for promoting students' understanding of concepts and skills related to engineering and technology and their relationship to other academic fields
- 9.4** strategies and skills for planning and designing engineering and technology education instruction, including the use of techniques and approaches that meet the needs of diverse learners
- 9.5** instructional strategies to promote student learning and to foster the development of critical-thinking, problem-solving, and performance skills in engineering and technology education
- 9.6** communication methods that promote student learning and foster active inquiry, interaction, and collaboration in the engineering and technology education classroom
- 9.7** strategies and skills for selecting, adapting, and using technological resources to support teaching and learning about engineering and technology
- 9.8** ways to design, create, and manage safe and effective laboratories and learning environments that promote students' success
- 9.9** strategies and skills for effectively assessing students' understanding and mastery of concepts and skills essential to engineering and technology as well as relevant out-of-content-area concepts
- 9.10** strategies and skills for using assessment data to adjust and modify instruction for diverse learners