GACE® Engineering and Technology Education Assessment
Test at a Glance
Updated June 2017

See the GACE® Engineering and Technology Assessment Study Companion for practice questions and preparation resources.

Assessment Name	Engineering and Technology Education
Grade Level	EC–12
Test Code	Test I: 052 Test II: 053 Combined Test I and Test II: 552
Testing Time	Test I: 2 hours Test II: 2 hours Combined Test I and Test II: 4 hours
Test Duration	Test I: 2.5 hours Test II: 2.5 hours Combined Test I and Test II: 5 hours
Test Format	Computer delivered
Number of Selected-response Questions	Test I: 60 Test II: 60 Combined Test I and Test II: 120
Question Format	The test consists of a variety of short-answer questions such as selected-response questions, where you select one answer choice or multiple answer choices (depending on what the question asks for), questions where you enter your answer in a text box, and other types of questions. You can review the possible question types in the *Guide to Taking a GACE Computer-delivered Test*.
Number of Constructed-response Questions	Test I: 0 Test II: 0 Combined Test I and Test II: 0

About This Test

The GACE Engineering and Technology Education assessment is designed to measure the professional knowledge of prospective EC−12 Technology Education teachers in the state of Georgia.

This assessment includes two tests. You may take either test individually or the full assessment in a single session. The testing time is the amount of time you will have to answer the questions on the test. Test duration includes time for tutorials and directional screens that may be included in the test.

The questions in this assessment assess both basic knowledge across content areas and the ability to apply principles.

The total number of questions that are scored is typically smaller than the total number of questions on the test. Most tests that contain selected-response questions also include embedded pretest questions, which are not used in calculating your score. By including pretest questions in the assessment, ETS is able to analyze actual test-taker performance on proposed new questions and determine whether they should be included in future versions of the test.

Content Specifications

Each test in this assessment is organized into content **subareas**. Each subarea is further defined by a set of **objectives** and their **knowledge statements**.

- The objectives broadly define what an entry-level educator in this field in Georgia public schools should know and be able to do.
- The knowledge statements describe in greater detail the knowledge and skills eligible for testing.
- Some tests also include content material at the evidence level. This content serves as descriptors of what each knowledge statement encompasses.

See a breakdown of the subareas and objectives for the tests in this assessment on the following pages.

Test I Subareas

Subarea	Approx. Percentage of Test
I. Engineering Design and Application	40%
II. Engineering and Technology Teaching Practices	33%
III. Engineering Profession and Professional Growth	27%

Test I Objectives

Subarea I: Engineering Design and Application

Objective 1: Understand the engineering design process

The beginning Engineering and Technology Education teacher:

A. Demonstrates ability to apply the engineering design process to model and solve problems using engineering principles

B. Applies skills to use and maintain technological products and systems for engineering design

C. Assesses the impact of products and systems

Objective 2: Apply and use engineering principles in the engineering design process

The beginning Engineering and Technology Education teacher:

A. Is familiar with engineering principles within

- medical technologies

- agricultural and related biotechnologies

- energy and power technologies

- information and communication technologies

- transportation technologies

- manufacturing technologies

- construction technologies

B. Understands the engineering design process, including iterative design, identifying realistic constraints, and applying decision making skills for selecting optimal solutions

Subarea II: Engineering and Technology Teaching Practices

Objective 1: Understand and use a variety of effective teaching practices that enhance and extend learning of engineering technology

The beginning Engineering and Technology Education teacher:

A. Ensures that the space and physical arrangement of instructional facilities are conducive to effective instruction and safety

B. Develops instructional goals and objectives for the engineering and technology education curriculum that are clear, relevant, and meaningful and that can be assessed

Objective 2: Understand and be able to interpret, develop, and implement curriculums for engineering and technology education programs, including instructional methods of teaching for the classroom and engineering and technology education lab activities

The beginning Engineering and Technology Education teacher:

A. Implements a variety of teaching methods (e.g., production lab and classroom workspaces) to enhance student learning in engineering and technology education

B. Selects and uses appropriate materials and resources for effectively teaching subject material in engineering and technology education

C. Demonstrates and incorporates safe laboratory procedures in classroom, lab, and field environments

D. Uses standard and authentic assessment tools and strategies to monitor individual and group progress in achieving learning goals

E. Provides students with leadership opportunities and practical experience in engineering and technology-related fields through student organizations and professional organizations

Subarea III: Engineering Profession and Professional Growth

Objective 1: Understand the organizational structure and historical development of career and engineering education and practice and its relationship to American business, industry, and careers

The beginning Engineering and Technology Education teacher:

A. Describes how engineering and technology education literacy can assist individuals in participating in society's decisions regarding the use of technology

B. Identifies sources of information about regulations and guidelines for the construction and use of instructional facilities in engineering and technology education

C. Is familiar with engineering disciplines, such as

- electrical engineering
- chemical engineering
- mechanical engineering
- civil engineering
- industrial engineering
- aeronautical/aerospace engineering
- automotive engineering
- computer software engineering
- biomedical engineering

Objective 2: Work with business, industry, and labor in establishing school/business/community partnerships and advisory committees

The beginning Engineering and Technology Education teacher:

A. Can apply oral and written skills to effectively communicate engineering and technology design decisions
B. Can apply management skills for leading interdisciplinary teams of students to solve complex problems

Test II Subareas

Subarea	Approx. Percentage of Test
I. The Nature of Technology and Society	33%
II. Abilities for a Technical World	33%
III. Design and Modeling	33%

Test II Objectives

Subarea I: The Nature of Technology and Society

Objective 1: Understand human, cultural, and social issues related to technology and practice legal and ethical behavior

The beginning Engineering and Technology Education teacher:

A. Explains the cultural, social, economic, and political effects of technology

B. Describes the advantages and disadvantages of technology on the environment and society

C. Recognizes the role of society in the development and use of technology

Objective 2: Demonstrate problem solving and construct knowledge about the fundamentals of technology

The beginning Engineering and Technology Education teacher:

A. Describes the characteristics and scope of technology

B. Identifies the core concepts of technology (STL2)

C. Explains the relationships among technologies and the connections between technology and other fields of study

D. Describes the influence of technology on history

Subarea II: Abilities for a Technological World

Objective 1: Demonstrate ability to use technological products and systems to support learning

The beginning Engineering and Technology Education teacher:

A. Understands and applies the universal systems model of technology

B. Distinguishes between the engineering design process and the universal systems model

Objective 2: Describe the role of troubleshooting, research and development, invention and innovation, and experimentation in problem solving in engineering and technology education

The beginning Engineering and Technology Education teacher:

A. Develops an understanding of the core concepts of invention and innovation

B. Develops an understanding of research and development as a specific problem-solving approach

Objective 3: Demonstrate an understanding of and be able to select and use various technologies

The beginning Engineering and Technology Education teacher:

A. Has an understanding of and uses
   - medical technologies
   - agricultural and related biotechnologies
   - energy and power technologies
   - information and communication technologies
   - transportation technologies
   - manufacturing technologies
   - construction technologies

Subarea III: Design and Modeling

Objective 1: Know how to implement technology across content areas to foster collaboration, communication, and innovation

The beginning Engineering and Technology Education teacher:

A. Demonstrates oral and written skills to effectively communicate engineering and technology design decisions

B. Demonstrates management skills for leading interdisciplinary teams to solve complex problems

Objective 2: Determine the selection and application of tools to gather, evaluate, validate, and use information

The beginning Engineering and Technology Education teacher:

A. Identifies the attributes of design
B. Evaluates the results of the engineering design process
C. Uses and analyzes modeling and prototyping
    - Mathematical
    - Physical
    - Interpret data and report
    - Prototyping