Engineering Accreditation Commission

# CRITERIA FOR ACCREDITING

# ENGINEERING PROGRAMS

Effective for Reviews during the 2026-2027 Accreditation Cycle
Incorporates all changes approved by the ABET Board of Delegates
Engineering Area Delegation as of October 24, 2025

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# Criteria for Accrediting Engineering Programs

Effective for Reviews during the 2026-2027 Accreditation Cycle

## Introduction

These criteria apply to all accredited engineering programs. Furthermore, these criteria are intended to foster the systematic pursuit of improvement in the quality of engineering education that satisfies the needs of its constituencies in a dynamic and competitive environment. It is the responsibility of the institution seeking accreditation of an engineering program to demonstrate clearly that the program meets the following criteria.

**This document contains four sections:**

The first section includes important **definitions**.

The second section contains the **General Criteria for Baccalaureate Level Programs** that must be satisfied by all programs accredited by the Engineering Accreditation Commission of ABET and the **General Criteria for Master's Level Programs** that must be satisfied by those programs seeking advanced level accreditation.

The third section contains the **Program Criteria** that must be satisfied by certain programs. The applicable Program Criteria are determined by the technical specialties indicated by the title of the program. Overlapping requirements need to be satisfied only once.

The fourth section contains **Proposed Changes to the Criteria** which, following a 180-day period of review and public comment, will be considered for adoption in the criteria for the next review cycle onwards.

## Definitions

While ABET recognizes and supports the prerogative of institutions to adopt and use the terminology of their choice, it is necessary for ABET volunteers and staff to have a consistent understanding of terminology. With that purpose in mind, the Commissions will use the following basic definitions:

**Program Educational Objectives**

> Program educational objectives are broad statements that describe what graduates are expected to attain within a few years after graduation. Program educational objectives are based on the needs of the program's constituencies.

**Program Constituencies**

> Program constituencies are groups, including external groups, identified by the program that have a common interest in the program and can provide meaningful input regarding the program educational objectives.

**Student Outcomes**

Student outcomes describe what students are expected to know and be able to do by the time of graduation. These relate to the knowledge, skills, and behaviors that students acquire as they progress through the program.

**Assessment**

Assessment is one or more processes that identify, collect, and prepare data to evaluate the attainment of student outcomes. Effective assessment uses relevant direct, indirect, quantitative and qualitative measures as appropriate to the outcome being measured. Appropriate sampling methods may be used as part of an assessment process.

**Evaluation**

Evaluation is one or more processes for interpreting the data and evidence accumulated through assessment processes. Evaluation determines the extent to which student outcomes are being attained. Evaluation results in decisions and actions regarding program improvement.

**Respectful Environment**

A respectful environment is inclusive and supports, values, and treats all members fairly and with dignity.

The Engineering Accreditation Commission of ABET recognizes that its constituents may consider certain terms to have certain meanings; however, it is necessary for the Engineering Accreditation Commission to have consistent terminology. Thus, the Engineering Accreditation Commission will use the following definitions in applying the criteria:

**Basic Science**

Basic sciences are disciplines focused on knowledge or understanding of the fundamental aspects of natural phenomena. Basic sciences consist of chemistry and physics and other natural sciences including life, earth, and space sciences.

**College-Level Mathematics**

College-level mathematics consists of mathematics that requires a degree of mathematical sophistication at least equivalent to that of introductory calculus. For illustrative purposes, some examples of college-level mathematics include calculus, differential equations, probability, statistics, linear algebra, and discrete mathematics.

**Complex Engineering Problems**

Complex engineering problems include one or more of the following characteristics: involving wide-ranging or conflicting technical issues, having no obvious solution, addressing problems not encompassed by current standards and codes, involving diverse groups of stakeholders, including many component parts or sub-problems, involving multiple disciplines, or having significant consequences in a range of contexts.

**Engineering Design**

Engineering design is a process of devising a system, component, or process to meet desired needs and specifications within constraints. It is an iterative, creative, decision-making process in which the basic sciences, mathematics, and engineering sciences are applied to convert resources into solutions. Engineering design involves identifying opportunities, developing requirements, performing analysis and synthesis, generating multiple solutions, evaluating solutions against requirements, considering risks, and making trade-offs, for the purpose of obtaining a high-quality solution under the given circumstances. For illustrative purposes only, examples of possible constraints include accessibility, aesthetics, codes, constructability, cost, ergonomics, extensibility, functionality, interoperability, legal considerations, maintainability, manufacturability, marketability, policy, regulations, schedule, standards, sustainability, or usability.

**Engineering Science**

Engineering sciences are based on mathematics and basic sciences but carry knowledge further toward creative application needed to solve engineering problems. These studies provide a bridge between mathematics and basic sciences on the one hand and engineering practice on the other.

**Team**

A team consists of more than one person working toward a common goal.

# I. GENERAL CRITERIA FOR BACCALAUREATE LEVEL PROGRAMS

All programs seeking accreditation from the Engineering Accreditation Commission of ABET must demonstrate that they satisfy all of the following General Criteria for Baccalaureate Level Programs.

## Criterion 1. Students

Student performance must be evaluated. Student progress must be monitored to foster success in attaining student outcomes, thereby enabling graduates to attain program educational objectives. Students must be advised regarding curriculum and career matters.

The program must have and enforce policies for accepting both new and transfer students, awarding appropriate academic credit for courses taken at other institutions, and awarding appropriate academic credit for work in lieu of courses taken at the institution. The program must have and enforce procedures to ensure and document that students who graduate meet all graduation requirements.

## Criterion 2. Program Educational Objectives

The program must have published program educational objectives, as defined in these criteria, that are consistent with the mission of the institution and the needs of the program's various constituencies. There must be a documented, systematically utilized, and effective process, involving all constituencies identified by the program, for the periodic review of these program educational objectives that ensures they remain consistent with the institutional mission and the needs of the program's constituencies.

## Criterion 3. Student Outcomes

The program must have documented student outcomes that support the program educational objectives. Attainment of these outcomes prepares graduates to enter the professional practice of engineering. Student outcomes are outcomes (1) through (7), plus any additional outcomes that may be articulated by the program.

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. an ability to communicate effectively with a range of audiences.
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative environment, establish goals, plan tasks, and meet objectives.
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

## Criterion 4. Continuous Improvement

The program must regularly use appropriate, documented processes for assessing and evaluating the extent to which the student outcomes are being attained. The results of these evaluations must be systematically utilized as input for the program's continuous improvement actions. Other available information may also be used to assist in the continuous improvement of the program.

## Criterion 5. Curriculum

The curriculum requirements specify subject areas appropriate to engineering but do not prescribe specific courses. The program curriculum must provide adequate content for each area, consistent with the student outcomes and program educational objectives, to ensure that students are prepared to enter the practice of engineering. The curriculum must include:

a. a minimum of 30 semester credit hours (or equivalent) of a combination of college-level mathematics and basic sciences with experimental experience appropriate to the program.
b. a minimum of 45 semester credit hours (or equivalent) of engineering topics appropriate to the program, consisting of engineering and computer sciences and engineering design, and utilizing modern engineering tools.
c. a broad education component that complements the technical content of the curriculum and is consistent with the program educational objectives.
d. a culminating major engineering design experience that 1) incorporates appropriate engineering standards and multiple constraints, and 2) is based on the knowledge and skills acquired in earlier course work.

## Criterion 6. Faculty

The program must demonstrate that the faculty members are of sufficient number and they have the competencies to cover all of the curricular areas of the program. There must be sufficient faculty to accommodate adequate levels of student-faculty interaction, student advising and counseling, university service activities, professional development, and interactions with industrial and professional practitioners, as well as employers of students.

The program faculty must have appropriate qualifications and must have and demonstrate sufficient authority to ensure the proper guidance of the program and to develop and implement processes for the evaluation, assessment, and continuing improvement of the program. The overall competence of the faculty may be judged by such factors as education, engineering experience, teaching effectiveness and experience, ability to communicate, enthusiasm for developing more effective programs, level of scholarship, participation in professional societies, and licensure as Professional Engineers.

## Criterion 7. Facilities

Classrooms, offices, laboratories, and associated equipment must be adequate to support attainment of the student outcomes and to provide an atmosphere conducive to learning. Modern tools, equipment, computing resources, and laboratories appropriate to the program must be available, and systematically maintained and upgraded to enable students to attain the student outcomes and to support program needs. Students must be provided appropriate guidance regarding the use of the tools, equipment, computing resources, and laboratories available to the program.

The library services and the computing and information infrastructure must be adequate to support the scholarly and professional activities of the students and faculty.

## Criterion 8. Institutional Support

Institutional support, resources, and leadership must be sufficient to: a) ensure the quality and continuity of the program; b) attract, retain, and provide for the continued professional development of a qualified faculty; c) acquire, maintain, and operate infrastructures, facilities and equipment appropriate for the program; and d) create and foster a respectful environment among the program’s students, faculty, staff, and administrators such that the student outcomes can be attained. Resources include institutional services and policies, financial support, and administrative and technical staff.

# II. GENERAL CRITERIA FOR MASTER'S LEVEL PROGRAMS

All programs seeking accreditation from the Engineering Accreditation Commission of ABET must demonstrate that they satisfy either the General Criteria for Stand-Alone Master's Level Programs or the General Criteria for Integrated Baccalaureate-Master's Programs.

## General Criteria for Stand-Alone Master's Level Programs

**Criterion MS1. Students**

Student performance and progress toward completion of their programs of study must be monitored and evaluated. The program must have and enforce policies and procedures to ensure that an individual program of study with specific educational goals is developed for each student. The program must have and enforce procedures to ensure and document that students who graduate meet all graduation requirements.

The program must also have and enforce procedures for verifying that each student has completed a set of post-secondary educational and professional experiences that:

a. Supports the attainment of student outcomes of Criterion 3 of the general criteria for baccalaureate level engineering programs, and
b. Includes at least 30 semester credit hours (or equivalent) of math and basic science, as well as at least 45 semester credit hours (or equivalent) of engineering topics, and a major design experience that meets the requirements of Criterion 5 of the general criteria for baccalaureate level engineering programs.

If the student has graduated from an EAC of ABET accredited baccalaureate program, then the presumption is that these prerequisites/ corequisites have been satisfied. Otherwise, the program must ensure that each student attains these post-secondary educational and professional experiences.

**Criterion MS2. Program Educational Objectives**

The program must have published program educational objectives, as defined in these criteria, that are consistent with the mission of the institution and the needs of the program's various constituencies. There must be a documented, systematically utilized, and effective process, involving all constituencies identified by the program, for the periodic review of these program educational objectives that ensures they remain consistent with the institutional mission and the needs of the program's constituencies.

**Criterion MS3. Student Outcomes**

The program must have documented student outcomes that support the program educational objectives. These outcomes prepare graduates to attain a mastery of a specific field of study or area of professional practice consistent with the master's level program name.

**Criterion MS4. Continuous Improvement**

The master's level engineering program must have a documented and operational process for assessing, maintaining and enhancing the quality of the program.

**Criterion MS5. Curriculum**

Each student's overall program of post-secondary study must satisfy the curricular components of the program criteria relevant to the master's level program name.

The program curriculum must provide adequate content for each component, consistent with the student outcomes and program educational objectives, to ensure that students are prepared to enter the practice of engineering. The curriculum must include:

a. a minimum of 30 semester credit hours (or equivalent) beyond the baccalaureate level.
b. topics in a specific field of study or area of professional practice consistent with the program name and at a level beyond baccalaureate-level programs.

**Criterion MS6. Faculty**

The program must demonstrate that the faculty members are of sufficient number and that they have the competencies to cover all of the curricular areas of the program. The program must have sufficient faculty to accommodate adequate levels of student-faculty interaction, student advising and counseling, university service activities, professional development, and interactions with industrial and professional practitioners, as well as employers of students.

Faculty teaching graduate-level courses must have appropriate educational qualifications by education or experience. The program faculty must have appropriate qualifications and must have and demonstrate sufficient authority to ensure the proper guidance of the program. The overall competence of the faculty may be judged by such factors as education, engineering experience, teaching effectiveness and experience, ability to communicate, level of scholarship, participation in professional societies, and licensure as Professional Engineers.

**Criterion MS7. Facilities**

Classrooms, offices, laboratories, and associated equipment must be adequate to support attainment of the student outcomes and to provide an atmosphere conducive to learning. These resources and facilities must be representative of current professional practice in the discipline.

Means of communication with students, and student access to laboratory and other facilities, must be adequate to support student success in the program, and to provide an atmosphere conducive to learning. Students must be provided guidance on the appropriate and safe use of the resources available to them.

The library and information services, computing and laboratory infrastructure, and equipment and supplies must be available and adequate to support the education of the students and the scholarly and professional activities of the faculty. Remote or virtual access to laboratories and other resources may be employed in place of physical access when such access enables accomplishment of the program's educational activities.

**Criterion MS8. Institutional Support**

Institutional support, resources, and leadership must be sufficient to: a) ensure the quality and continuity of the program; b) attract, retain, and provide for the continued professional development of a qualified faculty; c) acquire, maintain, and operate infrastructures, facilities and equipment appropriate for the program; and d) create and foster a respectful environment among the program's students, faculty, staff, and administrators such that the student outcomes can be attained. Resources include institutional services and policies, financial support, and administrative and technical staff.

## General Criteria for Integrated Baccalaureate-Master's Level Programs

### Criterion MI1. Students

Student performance must be evaluated. Student progress must be monitored to foster success in attaining student outcomes, thereby enabling graduates to attain program educational objectives. Students must be advised regarding curriculum and career matters.

The program must have and enforce policies for accepting both new and transfer students, awarding appropriate academic credit for courses taken at other institutions, and awarding appropriate academic credit for work in lieu of courses taken at the institution.

The program must have and enforce procedures to ensure and document that students who graduate meet all graduation requirements.

The program must have and enforce policies and procedures to ensure that an individual program of study with specific educational goals is developed for each student as part of the master's level component of the program.

### Criterion MI2. Program Educational Objectives

The program must have published program educational objectives, as defined in these criteria, that are consistent with the mission of the institution and the needs of the program's various constituencies. There must be a documented, systematically utilized, and effective process, involving all constituencies identified by the program, for the periodic review of these program educational objectives that ensures they remain consistent with the institutional mission and the needs of the program's constituencies.

### Criterion MI3. Student Outcomes

The program must have documented student outcomes that support the program educational objectives. Attainment of these outcomes prepares graduates to enter the professional practice of engineering. Student outcomes are outcomes (1) through (7), plus any additional outcomes that may be articulated by the program.

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. an ability to communicate effectively with a range of audiences.
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

5. an ability to function effectively on a team whose members together provide leadership, create a collaborative environment, establish goals, plan tasks, and meet objectives.
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

In addition, the program must have outcomes for the master's level component that prepare graduates to attain a mastery of a specific field of study or area of professional practice consistent with the program name.

**Criterion MI4. Continuous Improvement**

The baccalaureate-level component of the program must regularly use appropriate, documented processes for assessing and evaluating the extent to which Student Outcomes (1)-(7) are being attained. The results of these evaluations must be systematically utilized as input for the program's continuous improvement actions. Other available information may also be used to assist in the continuous improvement of the program.

The master's level component of the program must have a documented and operational process for assessing, maintaining and enhancing the quality of the program.

**Criterion MI5. Curriculum**

The curriculum requirements specify subject areas appropriate to engineering but do not prescribe specific courses. The program curriculum must provide adequate content for each area, consistent with the student outcomes and program educational objectives, to ensure that students are prepared to enter the practice of engineering. The curriculum must include:

a. a minimum of 30 semester credit hours (or equivalent) of a combination of college-level mathematics and basic sciences with experimental experience appropriate to the program.
b. a minimum of 45 semester credit hours (or equivalent) of engineering topics appropriate to the program, consisting of engineering and computer sciences and engineering design, and utilizing modern engineering tools.
c. a broad education component that complements the technical content of the curriculum and is consistent with the program educational objectives.
d. a culminating major engineering design experience that 1) incorporates appropriate engineering standards and multiple constraints, and 2) is based on the knowledge and skills acquired in earlier course work.

The curriculum must also include:

e. a minimum of 30 semester credit hours (or equivalent) beyond the baccalaureate level.
f. topics in a specific field of study or area of professional practice consistent with the program name and at a level beyond the baccalaureate level.

**Criterion MI6. Faculty**

The program must demonstrate that the faculty members are of sufficient number and they have the competencies to cover all of the curricular areas of the program. There must be sufficient faculty to accommodate adequate levels of student-faculty interaction, student advising and counseling, university service activities, professional development, and interactions with industrial and professional practitioners, as well as employers of students.

The program faculty must have appropriate qualifications and must have and demonstrate sufficient authority to ensure the proper guidance of the program and to develop and implement processes for the evaluation, assessment, and continuing improvement of the program. The overall competence of the faculty may be judged by such factors as education, engineering experience, teaching effectiveness and experience, ability to communicate, enthusiasm for developing more effective programs, level of scholarship, participation in professional societies, and licensure as Professional Engineers.

In addition, faculty teaching graduate level courses must have appropriate educational qualifications by education or experience.

**Criterion MI7. Facilities**

Classrooms, offices, laboratories, and associated equipment must be adequate to support attainment of the student outcomes and to provide an atmosphere conducive to learning. Resources and facilities for the master's level portion of the program must be representative of current professional practice in the discipline.

Modern tools, equipment, computing resources, and laboratories appropriate to the program must be available, and safely and systematically maintained and upgraded to enable students to attain the student outcomes and to support program needs. Means of communication with students, and student access to laboratory and other facilities, must be adequate to support student success in the program, and to provide an atmosphere conducive to learning. Students must be provided guidance on the appropriate and safe use of tools, equipment, computing resources, laboratories, and other resources available to them.

The library and information services, computing and laboratory infrastructure, and equipment and supplies must be available and adequate to support the education of the students and the scholarly and professional activities of the faculty. Remote or virtual access to laboratories and other resources may be employed in place of physical access when such access enables accomplishment of the program's educational activities.

**Criterion MI8. Institutional Support**

Institutional support, resources, and leadership must be sufficient to: a) ensure the quality and continuity of the program; b) attract, retain, and provide for the continued professional development of a qualified faculty; c) acquire, maintain, and operate infrastructures, facilities and equipment appropriate for the program; and d) create and foster a respectful environment among the program's students, faculty, staff, and administrators such that the student outcomes can be attained. Resources include institutional services and policies, financial support, and administrative and technical staff.

## III. PROGRAM CRITERIA

Each program at the baccalaureate or master's level must satisfy applicable Program Criteria (if any). Program Criteria provide the specificity needed for interpretation of the general criteria as applicable to a given discipline. Requirements stipulated in the Program Criteria are limited to the areas of curricular topics and faculty qualifications. If a program, by virtue of its title, becomes subject to two or more sets of Program Criteria, then that program must satisfy each set of Program Criteria; however, overlapping requirements need to be satisfied only once.

## Aerospace and Similarly Named Engineering Programs

### Lead Society: American Institute of Aeronautics and Astronautics

These program criteria apply to engineering programs that include “aerospace,” “aeronautical,” “astronautical,” or similar modifiers in their titles.

1. Curriculum

The curriculum must include modeling, simulation, computing, and testing applied to the design and analysis of aerospace systems or subsystems and their operations. In this context, modeling is the development of abstract representations (mathematical, logical, or computational) of systems, capturing their essential features and dynamics. In addition, simulation is the execution of models over time or under varying conditions to observe responses, perform analysis, and draw conclusions.

Aeronautical engineering or similarly named engineering programs must cover atmospheric flight.

Astronautical engineering or similarly named engineering programs must cover space flight and the means to get to space.

Aerospace engineering programs or similarly named engineering programs must include content from both aeronautical engineering and astronautical engineering topics.

The curriculum must include design experience which contains content appropriate to the program name, though the culminating design experience for aerospace may be either aeronautical and/or astronautical system focused.

## Agricultural and Similarly Named Engineering Programs

### Lead Society: American Society of Agricultural and Biological Engineers

These program criteria apply to engineering programs that include “agricultural,” “forest,” “agroindustrial” or similar modifiers in their titles.

1. Curriculum

The curriculum must include mathematics through differential equations, biological and engineering sciences consistent with the program educational objectives and applications in agriculture, aquaculture, forestry, human, or natural resources.

2. Faculty

The program shall demonstrate that those faculty members teaching courses that are primarily design in content are qualified to teach the subject matter by virtue of education and experience or professional licensure.

## Architectural and Similarly Named Engineering Programs

### Lead Society: American Society of Civil Engineers
### Cooperating Society: American Society of Heating, Refrigerating, and Air-Conditioning Engineers

These program criteria apply to engineering programs that include "architectural" or similar modifiers in their titles.

1. Curriculum

The curriculum must include mathematics through differential equations, calculus-based physics, and chemistry. The four basic architectural engineering curriculum areas are building structures, building mechanical systems, building electrical systems, and construction/construction management. The curriculum must provide coverage at the synthesis (design) level in one of these areas, the application level in a second area, and the comprehension level in the remaining two areas. The engineering topics required by the general criteria shall support the engineering fundamentals of each of these four areas at the specified level. The curriculum must include the basic concepts of architecture in a context of architectural design and history.

The design level must be in a context that:

a. Considers the systems or processes from other architectural engineering curricular areas,
b. Works within the overall architectural design,
c. Includes communication and collaboration with other design or construction team members,
d. Includes computer-based technology and considers applicable codes and standards, and
e. Considers fundamental attributes of building performance and sustainability.

2. Faculty

The program must demonstrate that faculty teaching courses that are primarily engineering design in content are qualified to teach the subject matter by virtue of professional licensure, or by education and design experience. It must also demonstrate that the majority of the faculty members teaching architectural design courses are qualified to teach the subject matter by virtue of professional licensure, or by education and design experience.

## Bioengineering and Biomedical and Similarly Named Engineering Programs

Lead Society: Biomedical Engineering Society

Cooperating Societies: American Ceramic Society, American Institute of Chemical Engineers, American Society of Agricultural and Biological Engineers, American Society of Mechanical Engineers, and IEEE

These program criteria apply to engineering programs that include “bioengineering,” “biomedical,” or similar modifiers in their titles.

1. Curriculum

The structure of the curriculum must provide both breadth and depth across the range of engineering and science topics consistent with the program educational objectives and student outcomes.

The curriculum must include experience in:

a. Applying principles of engineering, biology, human physiology, chemistry, calculus-based physics, mathematics (through differential equations) and statistics;
b. Solving bio/biomedical engineering problems, including those associated with the interaction between living and non-living systems;
c. Analyzing, modeling, designing, and realizing bio/biomedical engineering devices, systems, components, or processes; and
d. Making measurements on and interpreting data from living systems.

## Biological and Similarly Named Engineering Programs

Lead Society: American Society of Agricultural and Biological Engineers
Cooperating Societies: American Academy of Environmental Engineers and Scientists, American Ceramic Society, American Institute of Chemical Engineers, American Society of Civil Engineers, American Society of Mechanical Engineers, Biomedical Engineering Society, CSAB, IEEE, Institute of Industrial and Systems Engineers, and The Minerals, Metals, and Materials Society

These program criteria apply to engineering programs that include "biological," "biological systems," "food," or similar modifiers in their titles with the exception of bioengineering and biomedical engineering programs.

1. Curriculum

The curriculum must include mathematics through differential equations, college-level chemistry and biology, advanced biological sciences, and applications of engineering to biological systems.

2. Faculty

The program shall demonstrate that those faculty members teaching courses that are primarily design in content are qualified to teach the subject matter by virtue of education and experience or professional licensure.

## Chemical, Biochemical, Biomolecular, and Similarly Named Engineering Programs

### Lead Society: American Institute of Chemical Engineers

These program criteria apply to engineering programs that include "chemical," "biochemical," "biomolecular," or similar modifiers in their titles.

1. Curriculum

The curriculum must include:

a. Applications of mathematics, including differential equations and statistics to engineering problems.
b. College-level chemistry and physics courses, with some at an advanced level, as appropriate to the objectives of the program.
c. Engineering application of these sciences to the design, analysis, and control of processes, including the hazards associated with these processes.

Programs with biochemical, biomolecular, or similar modifiers in their titles must also include biologically-based engineering applications in their curriculum as appropriate to the program's name and educational objectives.

## Civil and Similarly Named Engineering Programs

### Lead Society: American Society of Civil Engineers

These program criteria apply to engineering programs that include "civil" or similar modifiers in their titles.

1. Curriculum

The curriculum must include:

a. Application of:
    i. mathematics through differential equations, probability and statistics, calculus-based physics, chemistry, and either computer science, data science, or an additional area of basic science
    ii. engineering mechanics, materials science, and numerical methods relevant to civil engineering
    iii. principles of sustainability, risk, and resilience to civil engineering problems
    iv. the engineering design process in at least two civil engineering contexts
    v. an engineering code of ethics to ethical dilemmas
b. Solution of complex engineering problems in at least four specialty areas appropriate to civil engineering
c. Conduct of experiments in at least two civil engineering contexts and reporting of results
d. Explanation of:
    i. concepts and principles in project management and engineering economics
    ii. professional attitudes and responsibilities of a civil engineer, including licensure and safety

2. Faculty

The program must demonstrate that faculty teaching courses that are primarily design in content are qualified to teach the subject matter by virtue of professional licensure, or by education and design experience.

## Construction and Similarly Named Engineering Programs

### Lead Society: American Society of Civil Engineers

These program criteria apply to engineering programs that include "construction" or similar modifiers in their titles.

1. Curriculum

The curriculum must include:

a. Application of:
   i. mathematics through differential and integral calculus, probability and statistics, general chemistry, and calculus-based physics;
   ii. knowledge of construction methods, materials, equipment, planning, scheduling, safety, and cost analysis.
b. Analysis and design of construction processes and systems in a construction engineering specialty field.
c. Explanation of:
   i. basic legal and ethical concepts and the importance of professional engineering licensure in the construction industry;
   ii. basic concepts of management topics such as economics, business, accounting, communications, leadership, decision and optimization methods, engineering economics, engineering management, and cost control.

2. Faculty

The program must demonstrate that the majority of faculty teaching courses that are primarily design in content are qualified to teach the subject matter by virtue of professional licensure, or by education and design experience. The faculty must include at least one member who has had full-time experience and decision-making responsibilities in the construction industry.

## Cybersecurity Engineering and Similarly Named Engineering Programs

### Co-Lead Societies: IEEE, CSAB, International Council on Systems Engineering (INCOSE)

These program criteria apply to engineering programs that include “cybersecurity”, “computer security”, “cyber operations”, “information assurance”, “information security”, or similar modifiers in their titles.

1. Curriculum

The structure of the curriculum must provide both breadth and depth across the range of engineering topics implied by the title of the program. The curriculum must include:

a. Probability, statistics, and cryptographic topics including applications appropriate to the program.
b. Discrete mathematics and specialized mathematics appropriate to the program, such as, abstract algebra, information theory, number theory, complexity theory, and finite fields.
c. Engineering topics necessary to determine cybersecurity requirements and to analyze, design, test, and protect complex devices and systems that incorporate hardware, software, and human components.
d. Application of protective technologies and forensic techniques.
e. Analysis and evaluation of components and systems with respect to security and to maintaining operations in the presence of risks and threats.
f. Consideration of legal, regulatory, privacy, ethics, and human behavior topics as appropriate to the program.

The curriculum must provide both breadth and depth across the range of engineering and computing topics necessary for the application of computer security principles and practices to the design, implementation, and operation of the physical, software, and human components of a system, as appropriate to the program.

2. Faculty

The program must demonstrate that faculty members teaching core engineering topics understand methods of engineering design, engineering problem solving, and engineering practice with specific relevance to security.

## Ecological and Similarly Named Engineering Programs

### Co-Lead Societies: American Academy of Environmental Engineers and Scientists, American Society of Agricultural and Biological Engineers, and American Society of Civil Engineers

1. Curriculum

The curriculum must include:

a. mathematics through differential equations, probability and statistics, calculus-based physics, and college-level chemistry.
b. earth science, fluid mechanics, hydraulics, and hydrology.
c. biological and advanced ecological sciences that focus on multi-organism self-sustaining systems at a range of scales, systems ecology, ecosystem services, and ecological modeling.
d. material and energy balances; fate and transport of substances in and between air, water, and soil; thermodynamics of living systems.
e. applications of ecological principles to engineering design that include considerations of climate, species diversity, self-organization, uncertainty, sustainability, resilience, interactions between ecological and social systems, and system-scale impacts and benefits.

2. Faculty

The program must demonstrate that those faculty members teaching courses that are primarily design in content are qualified to teach the subject matter by virtue of professional licensure or by education and equivalent design experience.

## Electrical, Computer, Communications, Telecommunication(s), and Similarly Named Engineering Programs

Lead Society: IEEE

Cooperating Society for Computer Engineering Programs: CSAB

These program criteria apply to engineering programs that include “electrical,” “electronic(s),” “computer,” “communication(s),” telecommunication(s), or similar modifiers in their titles.

1. Curriculum

The structure of the curriculum must provide both breadth and depth across the range of engineering topics implied by the title of the program.

The curriculum must include probability and statistics, including applications appropriate to the program name; mathematics through differential and integral calculus; sciences (defined as biological, chemical, or physical science); and engineering topics (including computing science) necessary to analyze and design complex electrical and electronic devices, software, and systems containing hardware and software components.

The curriculum for programs containing the modifier “electrical,” “electronic(s),” “communication(s),” or “telecommunication(s)” in the title must include advanced mathematics, such as differential equations, linear algebra, complex variables, and discrete mathematics.

The curriculum for programs containing the modifier “computer” in the title must include discrete mathematics.

The curriculum for programs containing the modifier “communication(s)” or “telecommunication(s)” in the title must include topics in communication theory and systems.

The curriculum for programs containing the modifier “telecommunication(s)” must include design and operation of telecommunication networks for services such as voice, data, image, and video transport.

## Engineering, General Engineering, Engineering Physics, Engineering Science, and Similarly Named Engineering Programs

Lead Society: American Society for Engineering Education

These program criteria apply to engineering programs that include “engineering (without modifiers),” “general engineering,” “engineering physics,” or “engineering science(s),” in their titles.

There are no program-specific criteria beyond the General Criteria.

## Engineering Management and Similarly Named Engineering Programs

Lead Society: Institute of Industrial and Systems Engineers
Cooperating Societies: American Institute of Chemical Engineers, American Society of Civil Engineers, American Society of Mechanical Engineers, IEEE, Society of Manufacturing Engineers, and Society of Petroleum Engineers

These program criteria apply to engineering programs that include “management” or similar modifiers in their titles.

1. Curriculum

The structure of the curriculum must provide both breadth and depth across engineering management topics, including appropriate course sequencing, consistent with the program educational objectives and student outcomes.

The curriculum must include topics covering the management of technical personnel, projects, and organizations, including:

a. Management topics which may include project management, technology management, team building, and strategy; and
b. Financial resource topics chosen from examples such as engineering economics, accounting, estimating, and finance; and
c. Modeling topics for decision-making in a stochastic world, which may include production management, quality control, simulation, and operations research.

2. Faculty

Programs must demonstrate that faculty members teaching courses that are primarily engineering management in content are qualified through education in engineering, and education or experience in managing engineering or technical activities.

## Engineering Mechanics and Similarly Named Engineering Programs

### Lead Society: American Society of Mechanical Engineers

These program criteria apply to engineering programs that include "mechanics" or similar modifiers in their titles.

1. Curriculum

The curriculum must include mathematical and computational topics necessary to analyze, model, and design physical systems consisting of solid and fluid components under steady state and transient conditions.

2. Faculty

The program must demonstrate that faculty members responsible for upper-level professional courses maintain currency in their specialty area(s).

## Environmental Engineering and Similarly Named Engineering Programs

Lead Society: American Academy of Environmental Engineers and Scientists
Cooperating Societies: American Institute of Chemical Engineers, American Society of Agricultural and Biological Engineers, American Society of Civil Engineers, American Society of Heating, Refrigerating and Air-Conditioning Engineers, American Society of Mechanical Engineers, SAE International, and Society for Mining, Metallurgy, and Exploration

These program criteria apply to engineering programs that include "environmental," "sanitary," or similar modifiers in their titles.

1. Curriculum

The curriculum must include:

a. Mathematics through differential equations, probability and statistics, calculus-based physics, chemistry (including stoichiometry, equilibrium, and kinetics), earth science, biological science, and fluid mechanics.
b. Material and energy balances, fate and transport of substances in and between air, water, and soil phases; and advanced principles and practices relevant to the program objectives.
c. Hands-on laboratory experiments, and analysis and interpretation of the resulting data in more than one major environmental engineering focus area, e.g., air, water, land, environmental health.
d. Design of environmental engineering systems that includes considerations of risk, uncertainty, sustainability, life-cycle principles, and environmental impacts.
e. Concepts of professional practice and project management, and the roles and responsibilities of public institutions and private organizations pertaining to environmental policy and regulations.

2. Faculty

The program must demonstrate that a majority of those faculty members teaching courses that are primarily design in content are qualified to teach the subject matter by virtue of professional licensure, board certification in environmental engineering, or by education and equivalent design experience.

## Fire Protection and Similarly Named Engineering Programs

### Lead Society: Society for Fire Protection Engineers

These program criteria apply to engineering programs that include "fire protection" or similar modifiers in their title.

1. Curriculum

The curriculum must include topics in the application of science and engineering to protect the health, safety, and welfare of the public from the impacts of fire, including the principles of: 1) fire science; 2) human behavior and evacuation; 3) fire protection systems; and 4) fire protection analysis.

Curriculum topics must also include the integration of the above four principles to solve field problems using computational, experimental and performance-based design methods.

2. Faculty

The program must demonstrate that faculty members maintain currency in fire protection engineering practice.

## Geological and Similarly Named Engineering Programs

### Lead Society: Society for Mining, Metallurgy, and Exploration

These program criteria apply to engineering programs that include "geological" or similar modifiers in their titles.

1. Curriculum

The curriculum must include:

a. mathematics including differential equations, calculus-based physics, and chemistry, with application to geological engineering problems;
b. geological science topics that emphasize geologic processes and the identification of minerals and rocks;
c. visualization of and solutions to geological problems in three and four dimensions;
d. engineering sciences including statics, properties/strength of materials, and geomechanics;
e. principles of geology, elements of geophysics, geological and engineering field methods; and
f. geological engineering design problems, which must include one or more of the following considerations:
    i. the distribution of physical and chemical properties of earth materials, including surface water, ground water (hydrogeology), and fluid hydrocarbons;
    ii. the effects of surface and near-surface natural processes;
    iii. the impacts of construction projects;
    iv. the impacts of exploration, development, and extraction of natural resources, and consequent remediation; disposal of wastes; and other activities of society on these materials and processes, as appropriate to the program objectives.

2. Faculty

The program must demonstrate that faculty members teaching courses that are primarily design in content are qualified to teach the subject matter by virtue of professional licensure, or by education and design experience.

## Industrial and Similarly Named Engineering Programs

### Lead Society: Institute of Industrial and Systems Engineers

These program criteria apply to engineering programs that include "industrial" or similar modifiers in their titles.

1. Curriculum

The curriculum must provide both breadth and depth across the range of engineering science, computer science, and engineering design topics implied by the title and objectives of the program.

The curriculum must include design, analysis, operation, and improvement of integrated systems that produce or supply products or services in an effective, efficient, sustainable, and socially responsible manner.

The curriculum must utilize real-world experiences and business perspectives.

The curriculum must include the topical areas of productivity analysis, operations research, probability, statistics, engineering economy, and human factors.

2. Faculty

The program must demonstrate that faculty members who teach core industrial engineering courses have an understanding of professional practice and maintain currency in their respective professional areas.

## Manufacturing and Similarly Named Engineering Programs

Lead Society: Society of Manufacturing Engineers

These program criteria apply to engineering programs that include "manufacturing" and similar modifiers in their titles.

1. Curriculum

The program must include curricular content in the following areas:

a. materials and manufacturing processes: design of products, manufacturing processes, and systems that meet specific design intent, material, life cycle, and other requirements;
b. process, assembly and product engineering: utilizing modern engineering equipment, tooling, and environment necessary for their manufacture;
c. manufacturing competitiveness: creation of competitive advantage through advanced manufacturing technologies, manufacturing planning, strategy, quality, and control;
d. manufacturing systems design: analyze, synthesize, and control manufacturing operations using statistical methods; and
e. manufacturing laboratory or facility experience: measurement of manufacturing process input variables, analysis of output responses, and development of technical inferences about the process.

The culminating major engineering design experience must address a manufacturing engineering problem.

2. Faculty

The program must demonstrate that faculty members maintain currency in manufacturing engineering practice.

## Materials (1), Metallurgical (2), Ceramics (3), and Similarly Named Engineering Programs

(1,2) Lead Society for Materials and Metallurgical Engineering Programs: The Minerals, Metals & Materials Society

(3) Lead Society for Ceramics Engineering Programs: American Ceramic Society

(1) Cooperating Societies for Materials Engineering Programs: American Ceramic Society, American Institute of Chemical Engineers, and American Society of Mechanical Engineers

(2) Cooperating Society for Metallurgical Engineering Programs: Society for Mining, Metallurgy, and Exploration

(3) Cooperating Society for Ceramics Engineering Programs: The Minerals, Metals & Materials Society

These program criteria apply to engineering programs including “materials”, “metallurgical (except extractive metallurgical)”, “ceramics”, “glass”, “polymer”, “biomaterials”, and similar modifiers in their titles.

1. Curriculum

The curriculum must include topics that:

a. underlie the four major elements of the field: (i.e., structure, properties, processing, and performance) related to material systems, as appropriate to the program title;
b. employ selection and design of materials, processes, or a combination of materials and processes; and
c. apply experimental, statistical, and computational methods to materials problems.

2. Faculty

Program faculty expertise must encompass the four major elements of the field.

## Mechanical and Similarly Named Engineering Programs

### Lead Society: American Society of Mechanical Engineers

These program criteria will apply to all engineering programs that include “mechanical” or similar modifiers in their titles.

1. Curriculum

In preparation for professional practice, the curriculum must include:

a. principles of engineering, basic science, and mathematics (including multivariate calculus and differential equations);
b. applications of these topics to modeling, analysis, design, and realization of physical systems, components, or processes;
c. coverage of both thermal and mechanical systems; and
d. in-depth coverage of either thermal or mechanical systems.

2. Faculty

The program must demonstrate that faculty members responsible for the upper-level professional courses maintain currency in their specialty area(s).

## Mechatronics, Robotics, and Similarly Named Engineering Programs

Co-Lead Societies: American Society of Mechanical Engineers and IEEE
Cooperating Societies: CSAB, Society of Manufacturing Engineers

These program criteria apply to engineering programs that include “mechatronics”, “robotics”, or similar modifiers in their titles.

1. Curriculum

The structure of the curriculum must provide both breadth and depth across the range of engineering topics implied by the title of the program.

The curriculum must include:

a. Differential calculus, integral calculus, differential equations, linear algebra, and calculus-based physics
b. Engineering topics including mechanical systems, electronic circuits, control systems, and computer science, as well as the application of sensors, actuators, and embedded controllers
c. Modeling, analysis, and design of systems or processes that integrate hardware and software to control mechanical systems

2. Faculty

The program must demonstrate that faculty members responsible for upper-level courses in engineering topics are maintaining currency in their specialty area(s).

## Mineral Processing, Extractive Metallurgical, and Similarly Named Engineering Programs

Lead Society: Society for Mining, Metallurgy, and Exploration
Cooperating Society for Extractive Metallurgical Engineering Programs: The Minerals, Metals & Materials Society

These program criteria apply to engineering programs that include "mineral processing," "extractive metallurgical," or similar modifiers in their titles.

1. Curriculum

The curriculum must include:

a. mathematics through differential equations, calculus-based physics, general chemistry, and probability and statistics with engineering applications appropriate to the program name;
b. geological sciences, including general geology and mineralogy;
c. engineering topics:
    i. statics and fluid mechanics;
    ii. fundamental processing topics, including mass and heat balances, materials characterization and analysis, chemical or metallurgical thermodynamics, energy and mass transfer, and kinetic reactions;
    iii. process engineering topics, including flowsheet design, instrumentation and control, comminution, solid/liquid separation, and physical separations including flotation; and
    iv. other engineering topics, including materials handling and engineering economics.
d. Mineral processing laboratory experiences including laboratory methods, design of experiments, and applications of computer software, as appropriate to the program name.

Programs containing the modifier "extractive metallurgical" or similar terminology in the title must include hydrometallurgy, electrometallurgy, and pyrometallurgy, with appropriate associated laboratory experiences.

## Mining and Similarly Named Engineering Programs

### Lead Society: Society for Mining, Metallurgy, and Exploration

These program criteria apply to engineering programs that include “mining” or similar modifiers in their titles.

1. Curriculum

The curriculum must include:

a. mathematics through differential equations, calculus-based physics, general chemistry, and probability and statistics with application to mining engineering problems;
b. geological science topics including characterization of mineral deposits, physical geology, structural or engineering geology, and mineral and rock identification and properties; and,
c. engineering topics including:
    i. statics, dynamics, strength of materials, fluid mechanics, thermodynamics, and electrical circuits;
    ii. complex engineering problems and engineering design tasks related to both surface and underground mining, including: mining methods, planning and design, ground control and rock mechanics, health and safety, environmental issues, materials handling, and mine ventilation;
    iii. additional engineering topics incorporating complex engineering problems and engineering design tasks into topics such as rock fragmentation, mineral or coal processing, mine surveying, mine valuation, resource/reserve estimation, mine sustainability, and mine automation as appropriate to the program’s educational objectives.
    iv. laboratory experience in geologic concepts, rock mechanics, mine ventilation, and other topics appropriate to the program’s objectives.

2. Faculty

The program must demonstrate that faculty members teaching courses covering mine ventilation and rock mechanics, as well as those courses that are primarily design in content, are qualified to teach the subject matter by virtue of professional licensure, or by education and design experience.

## Naval Architecture, Marine Engineering, Ocean Engineering, and Similarly Named Engineering Programs

Lead Society: Society of Naval Architects and Marine Engineers
Cooperating Societies for Ocean Engineering: American Society of Civil Engineers and IEEE

These program criteria apply to engineering programs that include "naval architecture", "marine engineering", "naval engineering", "maritime engineering", "ocean engineering" or similar titles.

1. Curriculum

The structure of the curriculum must provide both breadth and depth across the range of engineering topics implied by the title of the program.

The curriculum must include applications of probability and statistics, fluid mechanics, dynamics, and engineering design at the system level.

The curriculum for programs with titles containing "naval architecture" must also include hydrostatics, structural mechanics, materials properties, energy/propulsion systems, and instrumentation appropriate to naval architecture.

The curriculum for programs with titles containing "marine engineering", "naval engineering", "maritime engineering" or similar terms must also include energy/propulsion systems, materials properties, and instrumentation appropriate to marine engineering.

The curriculum for programs with titles containing "ocean engineering" or similar terms must also include solid mechanics, hydrostatics, oceanography, water waves, and underwater acoustics.

2. Faculty

The program must demonstrate that faculty members have maintained currency in their specialty area.

## Nuclear, Radiological, and Similarly Named Engineering Programs
Lead Society: American Nuclear Society

These program criteria apply to engineering programs that include "nuclear," "radiological," or similar modifiers in their titles.

1. Curriculum

The program must include the following curricular topics in sufficient depth for engineering practice:

a. mathematics, to support analyses of complex nuclear or radiological problems,
b. atomic and nuclear physics,
c. transport and interaction of radiation with matter,
d. nuclear or radiological systems and processes,
e. nuclear fuel cycles,
f. nuclear radiation detection and measurement,
g. nuclear or radiological system design.

2. Faculty

The program must demonstrate that faculty members primarily committed to the program have current knowledge of nuclear or radiological engineering by education or experience.

## Optical, Photonic, and Similarly Named Engineering Programs

Lead Society: IEEE

These program criteria apply to all engineering programs that include “optical,” “photonic,” or similar modifiers in their titles.

1. Curriculum

The structure of the curriculum must provide both breadth and depth across the range of engineering topics implied by the title of the program.

The curriculum must include theoretical instruction and laboratory experience in geometrical optics, physical optics, optical materials, optical devices and systems, and photonic devices and systems.

The curriculum must include chemical science, calculus-based physics, multivariable calculus, differential equations, linear algebra, complex variables, probability, statistics and their application in solving engineering problems.

The curriculum must also include design experiences that incorporate the application of engineering principles to model, analyze, design, and realize optical and/or photonic devices and/or systems.

2. Faculty

Faculty members who teach courses with significant design content must be qualified by virtue of design experience as well as subject matter knowledge.

## Petroleum and Similarly Named Engineering Programs

### Lead Society: Society of Petroleum Engineers

These program criteria apply to engineering programs that include "petroleum," "natural gas," or similar modifiers in their titles.

1. Curriculum

The curriculum must provide both breadth and depth across the range of engineering topics implied by the title and objectives of the program.

The curriculum must include:

a. mathematics through differential equations, probability and statistics, fluid mechanics, strength of materials, and thermodynamics;
b. design and analysis of well systems and procedures for drilling and completing wells;
c. characterization and evaluation of subsurface geological formations and their resources using geoscientific and engineering methods;
d. design and analysis of systems for producing, injecting, and handling fluids;
e. application of reservoir engineering principles and practices for optimizing resource development and management; and
f. the use of project economics and resource valuation methods for design and decision making under conditions of risk and uncertainty.

## Software and Similarly Named Engineering Programs

Lead Society: CSAB
Cooperating Society: IEEE

These program criteria apply to engineering programs that include “software” or similar modifiers in their titles.

1. Curriculum

The curriculum must provide both breadth and depth across the range of engineering and computer science topics implied by the title and objectives of the program.

The curriculum must include computing fundamentals, software design and construction, requirements analysis, security, verification, and validation; software engineering processes and tools appropriate for the development of complex software systems; and discrete mathematics, probability, and statistics, with applications appropriate to software engineering.

2. Faculty

The program must demonstrate that faculty members teaching core software engineering topics have an understanding of professional practice in software engineering and maintain currency in their areas of professional or scholarly specialization.

## Surveying and Similarly Named Engineering Programs

Lead Society: National Society for Professional Surveyors
Cooperating Society: American Society of Civil Engineers

These program criteria apply to engineering programs that include surveying, geomatics, or similar modifiers in their titles.

1. Curriculum

The curriculum must include:

a. Mathematics, including statistics, to support analyses of complex surveying/geomatics problems;
b. Historical and legal elements of land ownership, particularly where surveying/geomatics are an integral part;
c. Data science and analysis for conformance of precision and accuracy;
d. Data structure, format, storage, management, publication, visualization, and the related legal responsibilities to the public;
e. Modern measurement and design technologies necessary to model, locate or construct features above, below or on the Earth's surface;
f. Added depth in a minimum of four subject areas, consistent with the program's educational objectives, chosen from the following:
    - boundary or land surveying,
    - engineering surveys,
    - photogrammetry and remote sensing,
    - geodesy and geodetic surveying,
    - mapping including map projections and coordinate systems,
    - geospatial data science and land information systems,
    - civil engineering topics that assist the student in meeting the requirements for licensure in the state or region.

2. Faculty

Programs must demonstrate that faculty members teaching courses that are primarily design or professional practice in content are qualified to teach the subject matter by virtue of professional licensure or by a combination of educational and professional experience.

## Systems and Similarly Named Engineering Programs

### Co-Lead Societies: American Society of Mechanical Engineers, CSAB, IEEE, Institute of Industrial and Systems Engineers, ISA, International Council on Systems Engineering (INCOSE), and SAE International

These program criteria apply to engineering programs that include “systems” or “and systems” in their titles, with the exception of those that use the word “systems” with a direct modifier, such as mechanical systems, biological systems, control systems, etc.

1. Curriculum

The structure of the curriculum must provide both breadth and depth across the range of engineering topics implied by the title of the program.

The curriculum must include the following topics:

a. Advanced mathematics, including probability and statistics, and computing fundamentals, with practical applications thereof.
b. Engineering topics necessary to define, synthesize, analyze, design, and evaluate complex systems containing hardware and software, and human elements (where appropriate), in a holistic manner across the lifecycle.
c. Systems design and analysis topics, such as decision analysis, risk analysis (cost, schedule, and performance), trade-off analysis, optimization, modeling based engineering, simulation, sensitivity analysis techniques, or requirements engineering.

2. Faculty

The program shall demonstrate that those faculty members teaching courses that are primarily design in content are qualified to teach the subject matter by virtue of education and experience or professional licensure.

## IV. PROPOSED CHANGES TO THE CRITERIA

The following section presents proposed changes to these criteria as approved by the ABET Engineering Area Delegation on October 24, 2025 for a 180-day review and comment period. Comments will be considered until June 15, 2026. The ABET Engineering Area Delegation will determine, based on the comments received and on the advice of the EAC, the content of the adopted criteria. The adopted criteria will then become effective following the ABET Engineering Area Delegation meeting in the fall of 2026 and would first be applied by the EAC for accreditation reviews during the 2027-28 accreditation review cycle.

# Proposed Changes to EAC General Criteria - Criterion 5

## General Criteria for Engineering Programs

<u>Criterion 5. Curriculum</u>

The curriculum requirements specify subject areas appropriate to engineering but do not prescribe specific courses. The program curriculum must provide adequate content for each area, consistent with the student outcomes and program educational objectives, to ensure that students are prepared to enter the practice of engineering. The curriculum must include:

a. a minimum of 30 semester credit hours (or equivalent) of a combination of college-level mathematics and basic sciences with experimental experience appropriate to the program. If the program requires completion of specific college-level mathematics and basic sciences before entry, they may be included with appropriate documentation.
b. a minimum of 45 semester credit hours (or equivalent) of engineering topics appropriate to the program, consisting of engineering and computer sciences and engineering design, and utilizing modern engineering tools.
c. a broad education component that complements the technical content of the curriculum and is consistent with the program educational objectives.
d. a culminating major engineering design experience that 1) incorporates appropriate engineering standards and multiple constraints, and 2) is based on the knowledge and skills acquired in earlier course work.

# Proposed Program Criteria for Chemical, Biochemical, Biomolecular, and Similarly Named Engineering Programs

Lead Society: American Institute of Chemical Engineers

These program criteria apply to engineering programs that include "chemical," "biochemical," "biomolecular," or similar modifiers in their titles.

1. Curriculum

The curriculum must include:

a. Applications of mathematics, including differential equations and statistics to engineering problems.
b. College-level chemistry and physics courses, with some at an advanced level~~, as appropriate to the objectives of the program~~.
c. Engineering topics of material and energy balances, thermodynamics, fluid mechanics, heat and mass transfer, reaction and/or reactor engineering, process control, and separations.
d. Engineering application of these sciences and engineering topics to the design, analysis, and control of processes, including the hazards associated with these processes.

Programs with biochemical, biomolecular, or similar modifiers in their titles must also include biologically-based engineering applications in their curriculum as appropriate to the program's name and educational objectives.

2. Faculty

The program must demonstrate that those faculty members teaching program-specific courses have had training or professional development on effective teaching and learning strategies within the past six years.

# Proposed Program Criteria for Environmental Engineering and Similarly Named Engineering Programs

Lead Society: American Academy of Environmental Engineers and Scientists
Cooperating Societies: American Institute of Chemical Engineers, American Society of Agricultural and Biological Engineers, American Society of Civil Engineers, American Society of Heating, Refrigerating and Air-Conditioning Engineers, American Society of Mechanical Engineers, SAE International, and Society for Mining, Metallurgy, and Exploration

These program criteria apply to engineering programs that include "environmental," "sanitary," or similar modifiers in their titles.

1. Curriculum

The curriculum must include:

a. Mathematics through differential equations, probability and statistics, calculus-based physics, chemistry (including stoichiometry, equilibrium, and kinetics), earth science, biological science, and fluid mechanics.
b. Material and energy balances~~,~~; fate and transport of substances in and between air, water, and soil, and interactions with biota in these media phases; and advanced principles and practices relevant to the program objectives.
c. Hands-on laboratory experiments, and analysis and interpretation of the resulting data in more than one major environmental engineering focus area, e.g., air, water, land, environmental health.
d. Design of environmental engineering systems that includes considerations of risk, uncertainty, sustainability, life-cycle principles, and environmental impacts. Design of environmental engineering systems must include use of computational tools.
e. Concepts of professional practice and project management, and the roles and responsibilities of public institutions and private organizations pertaining to the protection and improvement of the environment, and applications of economics and ethics in environmental engineering ~~environmental policy and regulations~~.

2. Faculty

The program must demonstrate that a majority of ~~those faculty members teaching~~ courses that are primarily design in content are taught by faculty members who are qualified to teach the subject matter by virtue of professional licensure, board certification in environmental engineering, or by education and equivalent design experience.