Accreditation Criteria for Undergraduate Programs

The Accreditation Criteria for Undergraduate Programs are part of a series of documents associated with the ICACIT Evaluation Cycle and was approved by the ICACIT Board of Directors at its meeting on December 13, 2023

Document Code	Version	Year	Revised
AC-C-01	4.0	2023	13/12/2023

For more information about ICACIT, its program evaluation processes and other activities, you can visit www.icacit.org.pe, send a communication to Av. Del Pinar 152. Office 707. Santiago de Surco. Lima 033. Peru, or to acreditacion@icacit.org.pe

Table of Contents

ICACIT Accreditation Criteria for Undergraduate Programs – Engineering

TAKE INTO CONSIDERATION THAT:
(1) THIS DOCUMENT CONTAINS CRITERIA ESTABLISHED AND APPROVED BY THE ICACIT BOARD OF DIRECTORS.
(2) **BOLD** SEGMENTS INDICATE RECENT CHANGES APPROVED BY THE ICACIT BOARD OF DIRECTORS.

GENERAL CRITERIA

These criteria are intended to ensure quality and to promote the systematic pursuit of improved quality of education in order to meet the needs of constituencies in a dynamic and competitive environment. It is the responsibility of the institution seeking ICACIT Accreditation of a program to clearly demonstrate that the program meets these criteria.

CRITERION 1. Students

The program must monitor and evaluate the students performance throughout their training, offering the necessary and constant support to achieve the expected progress, promoting success in achieving the graduate attributes, thus allowing graduates to achieve the program educational objectives.

Students must be advised regarding curriculum, career development and job placement, in a structured way.

The program must have and enforce policies for: (a) admitting new and transfer students; (b) granting equivalent academic credits for courses taken at other institutions; and (c) developing pre-professional internships.

The admission process to the program must establish criteria in accordance with the admission profile, clearly specified in the prospectuses, which are public.

The program must design, implement and maintain student leveling mechanisms before the start of their studies.

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

The programme must maintain and make use of agreements with higher education institutions in the country and abroad for the mobility of students and professors, as well as for the exchange of experiences.

CRITERION 2. Program Educational Objectives and Graduates Follow-up

Program educational objectives must be public and consistent with the mission of the institution, the needs of the program constituencies, and these criteria.

There must be a documented and effective process for establishing and periodically reviewing educational objectives involving program constituencies. This review must be systematically used to ensure that the program educational objectives remain consistent with the institution's mission, the needs of the program constituencies, and these criteria.

The program must maintain an updated record of its graduates, establish a permanent link and monitor their job placement.

CRITERION 3. Graduate Attributes

The program must have documented graduate attributes that prepare graduates for the achievement of the program educational objectives.

The program must design appropriate processes and tools for the assessment of graduate attributes.

The program must enable students to achieve, upon graduation, each of the following graduate attributes:

- For Engineering Programs:

[AG-I01] The Professional and the World: Analyze and evaluate the impact of solutions to complex engineering problems on the sustainable development of society, the economy, sustainability, health and safety, legal frameworks, and the environment.

[AG-I02] Ethics: Apply ethical principles, professional ethics, and norms of engineering practice, adhere to relevant legal framework, and respect the diversity of human groups.

[AG-I03] Individual and Team Work: Function effectively as an individual and as a member of a team, in a multidisciplinary, collaborative, and inclusive environment, using face-to-face and remote interaction mechanisms and their combinations, establishing goals and strategies to meet their objectives.

[AG-I04] Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, through the preparation and understanding of reports and design documentation, and through the preparation and delivery of effective presentations, according to the target audience.

[AG-I05] Project Management: Apply the principles of engineering management and economic decision-making considering eventual risks, as a member and leader in a team, to manage projects in multidisciplinary environments.

[AG-I06] Lifelong Learning: Recognize the need and is prepared to: i) learn independently and continuously, ii) adapt to new and emerging technologies, and iii) apply critical thinking in the broadest context of technological change.

[AG-I07] Engineering Knowledge: Apply knowledge of mathematics, natural sciences, computing, and fundamental and specialized engineering knowledge to develop solutions to complex engineering problems.

[AG-I08] Problem Analysis: Identify, search for information, characterize and analyze complex engineering problems and their context, reaching informed conclusions using knowledge of mathematics, natural sciences, and engineering sciences from a holistic perspective for sustainable development.

[AG-I09] Design and Development of Solutions: Design creative solutions to complex engineering problems and design systems, components, or processes to meet identified needs within realistic constraints, as required, public health and safety, whole-life cost, net zero carbon, resource, cultural, social, economic, and environmental needs.

[AG-I10] Investigation: Conduct investigations of complex engineering problems using research methods including research-based knowledge, design and conduct of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.

[AG-I11] Tool Usage: Create, select, apply, and recognize limitations of appropriate techniques, resources, and modern engineering and IT tools, including prediction and modeling, to complex engineering problems.

CRITERION 4. Continuous Improvement

The program must have implemented a quality assurance system **that incorporates the ICACIT Accreditation Criteria**.

The program must regularly use appropriate, documented processes in the assessment and evaluation of the graduate attributes and the program educational objectives.

The results of these evaluations must be systematically used as input to: (1) the continuous improvement of the program **and (2) the sustainability of compliance with the ICACIT Accreditation Criteria**. Other available information may also be used to assist in the continuous improvement of the program.

The program must define, implement and monitor improvement plans for the aspects that have been participatively identified and prioritized as opportunities for improvement.

CRITERION 5. Curriculum

The program must ensure consistency of the curriculum with the graduate attributes, the program educational objectives and the mission of the institution.

The curriculum must include at least:

- For Engineering Programs:

  [P-I01] One year of a combination of college-level mathematics and basic sciences (some with experimental components) appropriate to the discipline.

  [P-I02] One and a half years of engineering topics, comprising engineering sciences and engineering design appropriate to the student's field of study.

  [P-I03] A general education component that complements the technical content of the curriculum, and that is consistent with the objectives of the program and the institution.

  [P-I04] Students should be prepared for the practice of engineering through a curriculum that culminates in an engineering design experience based on knowledge and skills acquired in previous courses, incorporating appropriate engineering standards and multiple realistic constraints.

One year is equivalent to 40 credits in the Peruvian educational system.

CRITERION 6. Faculty

Each faculty member dedicated to teaching in the program must have professional experience and academic training consistent with his or her expected contributions to the program.

Faculty competence should be demonstrated based on factors such as: academic background, professional experience, training and certifications, contributions to the discipline, teaching effectiveness, communication skills, and participation in professional societies. Collectively, the faculty should possess the breadth and depth to cover all areas of the program's curriculum.

There must be sufficient faculty to accommodate adequate levels of: (a) student-faculty interaction; (b) student advising; (c) interaction with industrial and professional practitioners, as well as employers of students.

The program must demonstrate that it is not critically dependent on one individual.

The program must ensure the development, professional updating and strengthening of the teaching capacities of its professors.

The program faculty must have and demonstrate sufficient authority to ensure appropriate program direction, as well as to develop and implement processes for assessing, evaluating, and continuously improving the program.

CRITERION 7. Facilities

Offices, classrooms, laboratories and associated equipment must be adequate, according to the study modality in which the program is offered, to support the achievement of the graduate attributes and provide a climate conducive to learning.

Modern tools, equipment, computing resources and appropriate laboratories must be available, accessible and systematically maintained and upgraded to enable students to achieve the graduate attributes and to support the needs of the program.

The program must provide students with appropriate guidance for the safe and proper use of available tools, equipment, computer resources and laboratories.

Information and reference centres and IT and communications infrastructure must be adequate and up-to-date to support the academic and professional activities of students and faculty.

The program must have access to information and reference centres, according to the needs of students and professors, available at the institution, managed through a program of continuous updating and improvement.

The program must have implemented an accessible integrated information and communication system, to support academic management, R&D&I&E and administrative management.

The program should ensure that students, faculty and staff have access to wellness services to improve their performance and training, and evaluate the impact of such services.

CRITERION 8. Institutional Support

Support and leadership from the institution's authorities must be adequate to ensure the quality and continuity of the program, as well as to promote inclusive education and social responsibility activities in the program.

Resources including institutional services, financial resources and staff (administrative and technical) assigned to the program must be adequate to meet its needs.

The resources available to the program must be sufficient to acquire, maintain and operate the infrastructure, facilities and equipment appropriate to the program, and to foster an environment in which the graduate attributes can be achieved.

The resources available for the program must be sufficient to attract, retain and train faculty to maintain an appropriately qualified faculty.

The program must manage the financial resources necessary for its operation, strengthening and sustainability over time.

PROGRAM CRITERIA

Each program must satisfy the applicable specific criteria (if any). Program criteria provide the specificity needed to interpret specific program criteria as they apply to a particular discipline. The requirements stipulated in the program criteria are limited to the graduate attributes, the curriculum, and the faculty. If a program, by virtue of its name, is subject to two or more sets of specific criteria, that program must satisfy all sets of criteria; however, overlapping requirements must be satisfied only once.

CRITERION 9. Program Criteria

- For Engineering Programs:

PROGRAM CRITERIA FOR AERONAUTICS, AEROSPACE, ASTRONAUTIC ENGINEERING AND SIMILARLY NAMED ENGINEERING PROGRAMS

These criteria apply to engineering programs that include “aeronautics”, “aerospace”, “astronautics”, or similar modifiers in their names.

Curriculum

The curriculum of programs that include the modifier “aeronautics” in their name must include the following topics with sufficient depth for the practice of engineering: aerodynamics, aerospace materials, structures, propulsion, flight mechanics, and stability and control.

The curriculum of programs that include the modifier “astronautics” in their name must include the following topics with sufficient depth for engineering practice: orbital mechanics, space environment, attitude determination and control, telecommunications, space structures, and rocket propulsion.

The curriculum of programs that include the modifier “aerospace”, which combine topics from aeronautical engineering and astronautical engineering, must include all topics with sufficient depth for the practice of engineering in one of the areas – aeronautical engineering or astronautical engineering, as previously described – and, in addition, a similar depth in at least two topics from the other area.

The engineering design experience must include topics appropriate to the name of the program.

Faculty

The program must demonstrate that those faculty teaching the advanced courses understand current professional practice in the aerospace industry.

PROGRAM CRITERIA FOR
AGRICULTURAL, AGROINDUSTRIAL, AGRONOMIC, FORESTRY, FISHERIES, ZOOTECHNIST ENGINEERING
AND SIMILARLY NAMED ENGINEERING PROGRAMS

These criteria apply to engineering programs that include “agricultural”, “agroindustrial”, “agronomics”, “forestry”, “fisheries”, “zootechnician” or similar modifiers in their names.

Curriculum

The curriculum must include mathematics including differential equations, biological sciences and engineering sciences consistent with the program educational objectives and applications in at least one of the following areas: agriculture, aquaculture, forestry, zootechnician, human resources or natural resources.

Faculty

The program must demonstrate that those faculty who teach courses whose primary content is design are qualified to teach the subjects by virtue of their education and experience or professional license.

PROGRAM CRITERIA FOR FOOD, BIOLOGICAL, FOOD INDUSTRY ENGINEERING AND SIMILARLY NAMED ENGINEERING PROGRAMS

These criteria apply to engineering programs that include “food”, “biological”, “biological systems”, “food industries” or similar modifiers in their names with the exception of bioengineering and biomedical engineering programs.

Curriculum

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

Faculty

The program must demonstrate that those faculty who teach courses whose primary content is design are qualified to teach the subjects by virtue of their education and experience or professional license.

PROGRAM CRITERIA FOR ENVIRONMENTAL, SANITARY ENGINEERING AND SIMILARLY NAMED ENGINEERING PROGRAMS

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

Curriculum

The curriculum must include mathematics including differential equations, probability and statistics, calculus-based physics, chemistry (including stoichiometry, equilibrium, and kinetics), earth sciences, biological sciences, and fluid mechanics.

The curriculum must include 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.

The curriculum must include hands-on laboratory experiments and analysis and interpretation of resulting data in more than one environmental engineering focus area (e.g., air, water, soil, environmental health).

The curriculum must include design of environmental engineering systems that include considerations of risk, uncertainty, sustainability, life cycle principles and environmental impact.

The curriculum must include concepts of professional practice, project management, and the roles and responsibilities of public institutions and private organizations in relation to environmental policy and regulation.

Faculty

The program must demonstrate that the majority of faculty teaching courses whose primary content is design are qualified to teach such subjects by virtue of their professional license, their certification in environmental engineering, or their education and experience in design.

PROGRAM CRITERIA FOR ARCHITECTURAL ENGINEERING AND SIMILARLY NAMED ENGINEERING PROGRAMS

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

Curriculum

The curriculum must include mathematics including differential equations, calculus-based physics and chemistry.

The curriculum must address the following four core areas: building structures, building mechanical systems, building electrical systems, and construction management. Graduates are expected to reach 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 in the curriculum required by the general criteria shall support the engineering fundamentals of each of these four areas at the specified level.

The curriculum must include basic concepts of architecture in a context of architectural design and history.

The level of design that the curriculum enables to be achieved must be in a context that: (1) considers systems or processes from other architectural engineering curriculum areas, (2) functions within the overall architectural design, (3) includes communication and collaboration with other members of the design or construction team, (4) includes computer-based technology and takes into account applicable codes and standards, and (5) considers fundamental attributes of building performance and sustainability.

Faculty

The program must demonstrate that faculty who teach courses whose primary content is design are qualified to teach such subjects by virtue of their professional license, or their education and experience in design.

The program must also demonstrate that the majority of faculty teaching architectural design courses are qualified to teach such subjects by virtue of their professional license, or their education and experience in design.

PROGRAM CRITERIA FOR BIOENGINEERING, BIOMEDICAL ENGINEERING AND SIMILARLY NAMED ENGINEERING PROGRAMS

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

Curriculum

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

The curriculum must include the application of principles of engineering, biology, human physiology, chemistry, calculus-based physics, mathematics (including differential equations), and statistics.

The curriculum must include the resolution of biomedical engineering or bioengineering problems, including those associated with the interaction between living and non-living systems.

The curriculum must include the analysis, modeling, design and implementation of biomedical engineering or bioengineering devices, systems, components or processes.

The curriculum must include making measurements and interpreting data from living systems.

PROGRAM CRITERIA FOR
CIVIL ENGINEERING
AND SIMILARLY NAMED ENGINEERING PROGRAMS

These criteria apply to engineering programs that include “civil” or similar modifiers in their names.

Curriculum

The curriculum must include the application of knowledge of mathematics including differential equations, calculus-based physics, chemistry, and at least one additional area of basic sciences.

The curriculum must include the application of probability and statistics to address uncertainty.

The curriculum must include analysis and problem solving in at least four technical areas specific to civil engineering.

The curriculum must include conducting experiments in at least two technical areas of civil engineering and analyzing and interpreting the resulting data.

The curriculum must include the design of a system, component or process in at least two civil engineering contexts.

The curriculum must address the inclusion of sustainability principles in design.

The curriculum must include basic concepts of project management, business, public policy and leadership.

The curriculum must include analysis of professional ethics issues.

The curriculum must address the importance of professional licensure.

Faculty

The program must demonstrate that faculty who teach courses whose primary content is design are qualified to teach such subjects by virtue of their professional license or educational training and experience in design.

PROGRAM CRITERIA FOR CONSTRUCTION ENGINEERING AND SIMILARLY NAMED ENGINEERING PROGRAMS

These criteria apply to engineering programs that include “construction” or similar modifiers in their names.

Curriculum

The curriculum must include the application of knowledge of mathematics including differential and integral calculus, probability and statistics, general chemistry, and calculus-based physics.

The curriculum must include the application of knowledge of construction methods, materials, equipment, planning, scheduling, safety, and cost analysis.

The curriculum must include analysis and design of construction processes and systems in a specialty field of construction engineering.

The curriculum must include basic legal and ethical concepts and the importance of professional engineering licensure in the construction industry.

The curriculum must include basic concepts of management topics such as economics, business, accounting, communications, leadership, decision and optimization methods, engineering economics, engineering management, and cost control.

Faculty

The program must demonstrate that the majority of faculty teaching courses whose primary content is design are qualified to teach such subjects by virtue of their professional license, or their education and experience in design.

The faculty must include at least one member who has had full-time experience and decision-making responsibilities in the construction industry.

PROGRAM CRITERIA FOR ELECTRICAL, ELECTRONICS, TELECOMMUNICATION AND COMPUTER ENGINEERING AND SIMILARLY NAMED ENGINEERING PROGRAMS

These criteria apply to engineering programs that include “electrical”, “electronics”, “computers”, “communications”, “telecommunications”, or similar modifiers in their names.

Curriculum

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

The curriculum must include probability and statistics, including applications appropriate to the name of the program.

The curriculum must include mathematics including differential and integral calculus.

The curriculum must include science (defined as biological, chemical or physical sciences).

The curriculum must include engineering topics (including computer science) necessary to analyze and design complex electrical and electronic devices, software, and systems containing hardware and software components.

The curriculum of programs that include the modifiers “electrical”, “electronics”, “communications”, or “telecommunications” in their name must include advanced mathematics such as differential equations, linear algebra, complex variables, and discrete mathematics.

The curriculum of programs that include the modifier “computers” in their name must include discrete mathematics.

The curriculum of programs that include the modifier “communications” or “telecommunications” in their name must include topics in communication theory and systems.

The curriculum of programs that include the modifier “telecommunications” in their name must include topics on the design and operation of telecommunications networks for voice, data, image and video transmission services.

PROGRAM CRITERIA FOR
ENERGY ENGINEERING
AND SIMILARLY NAMED ENGINEERING PROGRAMS

These criteria apply to engineering programs that include “energy” or similar modifiers in their names.

Curriculum

The curriculum must include topics in general chemistry, physics, differential equations, probability and statistics.

The curriculum must include the application of knowledge on fundamental engineering topics including mechanical design, engineering mechanics, electrical and electronic technology, computer applications, control engineering, and environmental engineering.

The curriculum must include the application of knowledge of engineering sciences including thermodynamics, fluid mechanics, heat and mass transfer, electrical machines, thermal energy, and testing technology in power engineering.

The curriculum must include the design of at least one of the following energy systems: solar, wind, biological, thermal, hydraulic or nuclear.

The curriculum must include laboratory experiments, training in innovation and entrepreneurship.

Faculty

The program must demonstrate that faculty teaching courses whose primary content is design are qualified to teach such subjects by virtue of their education and experience in design.

The faculty must include at least one member who has had full-time experience and decision-making responsibilities in the energy industry.

PROGRAM CRITERIA FOR
PHYSICAL ENGINEERING
AND SIMILARLY NAMED ENGINEERING PROGRAMS

These criteria apply to engineering programs that include "physics" or similar modifiers in their names.

Curriculum

The curriculum must include the application of knowledge of differential and integral calculus, differential equations, linear algebra, complex analysis and probability.

The curriculum must include the conduct of experiments in mechanics, electromagnetism, quantum physics and statistical thermodynamics and their application, together with methods of numerical analysis, to problems of engineering physics.

The curriculum must include engineering problem solving and design in at least one of the following areas: new and renewable energy resources, materials physics and nanotechnology, semiconductor physics, medical physics, imaging physics, optical engineering, optoelectronics, communications systems, quantum engineering, metrology, spectral analysis systems, numerical analysis or modeling and simulation techniques, thin film technology, nuclear sciences and technologies, environmental pollution, plasma physics, accelerator physics, experimental particle physics, quality control systems, superconductivity, and biophysics.

Faculty

The program must demonstrate that faculty teaching courses whose primary content is design are qualified to teach such subjects by virtue of their education and experience in design.

PROGRAM CRITERIA FOR GEOPHYSICAL, GEOLOGICAL ENGINEERING AND SIMILARLY NAMED ENGINEERING PROGRAMS

These criteria apply to engineering programs that include “geophysical”, “geological”, or similar modifiers in their names.

Curriculum

The curriculum must include mathematics, including differential equations, calculus-based physics, and chemistry, with applications to engineering problems appropriate to the program.

The curriculum must include geological science topics with an emphasis on geological processes and mineral and rock identification.

The curriculum must include visualization and resolution of geological problems in three and four dimensions.

The curriculum must include topics from engineering sciences including statics, properties or strength of materials and geomechanics.

The curriculum must include principles of geology, elements of geophysics, and geological and engineering field methods.

The curriculum must include engineering design problems with one or more of the following considerations: (1) the distribution of physical and chemical properties of earth materials, including surface water, groundwater (hydrogeology), and hydrocarbon fluids; (2) the effects of natural surface and near-surface processes; (3) the impacts of construction projects; (4) the impacts of natural resource exploration, development, and extraction, and subsequent reclamation; (5) waste disposal; and (6) other societal activities on these materials and processes, as appropriate to the program objectives.

Faculty

The program must demonstrate that faculty members teaching courses whose primary content is design are qualified to teach the subject matter by virtue of their professional license or educational training and experience in design.

PROGRAM CRITERIA FOR ENGINEERING MANAGEMENT AND SIMILARLY NAMED ENGINEERING PROGRAMS

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

Curriculum

The curriculum must include the engineering relationships among the management tasks of planning, organizing, leading, controlling, and the human element in production, research, and service organizations.

The curriculum must include the stochastic nature of management systems.

The curriculum must include the integration of management systems into a range of different technological environments.

Faculty

The main professional competence of the teaching staff should be engineering, and professors should have experience in managing engineering and/or technical activities.

PROGRAM CRITERIA FOR INDUSTRIAL ENGINEERING AND SIMILARLY NAMED ENGINEERING PROGRAMS

These criteria apply to engineering programs that include “industrial” or similar modifiers in their names.

Curriculum

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

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

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

The curriculum must include the subject areas of productivity analysis, operational research, probability, statistics, engineering economics, and human factors.

Faculty

The program must demonstrate that faculty teaching core industrial engineering courses understand professional practice and stay current in their respective professional areas.

PROGRAM CRITERIA FOR MANUFACTURING ENGINEERING AND SIMILARLY NAMED ENGINEERING PROGRAMS

These criteria apply to engineering programs that include “manufacturing”, “fabrication”, or similar modifiers in their names.

Curriculum

The curriculum must include topics on materials and manufacturing processes: design of manufacturing processes that result in products that meet specific materials and other requirements.

The curriculum must include topics in process, assembly and product engineering: equipment, tooling and environment necessary for its manufacture.

The curriculum must include topics on manufacturing competitiveness: creating competitive advantages through planning, strategy, quality and manufacturing control.

The curriculum must include topics in manufacturing systems design: analysis, synthesis and control of manufacturing operations using statistical methods.

The curriculum must include laboratory or manufacturing facility experience: measurement of manufacturing process variables and development of technical inferences about the process.

Faculty

The program must demonstrate that faculty remain current in manufacturing engineering practice.

PROGRAM CRITERIA FOR MATERIALS, METALLURGICAL ENGINEERING AND SIMILARLY NAMED ENGINEERING PROGRAMS

These criteria apply to engineering programs that include “materials”, “metallurgical (except extractive metallurgical)”, “ceramics”, “glass”, “polymer”, “biomaterials”, or similar modifiers in their names.

Curriculum

The curriculum must include topics that underlie the four main elements of the field (structure, properties, processing, and performance) related to materials systems, as appropriate to the name of the program.

The curriculum must include topics on the selection and design of materials, processes, or a combination of materials and processes.

The curriculum must include topics on the application of experimental, statistical and computational methods to materials problems.

Faculty

Faculty experience should encompass the four main elements of the field.

PROGRAM CRITERIA FOR MECHANICAL ENGINEERING AND SIMILARLY NAMED ENGINEERING PROGRAMS

These criteria apply to engineering programs that include “mechanical” or similar modifiers in their names.

Curriculum

The curriculum must include the application of principles of engineering, basic sciences, and mathematics (including multivariable calculus and differential equations).

The curriculum must include the application of principles of engineering, basic sciences, and mathematics in the modeling, analysis, design, and implementation of physical systems, components, or processes.

The curriculum must include both thermal and mechanical systems.

The curriculum must include an in-depth treatment of thermal or mechanical systems.

Faculty

The program must demonstrate that the professors responsible for the higher level of the program remain up to date in their areas of specialty.

PROGRAM CRITERIA FOR
MECHATRONICS ENGINEERING
AND SIMILARLY NAMED ENGINEERING PROGRAMS

These criteria apply to engineering programs that include “mechatronics” or similar modifiers in their names.

Curriculum

The curriculum must include the application of knowledge of calculus-based physics and mathematics including multivariable calculus, differential equations, differential and integral calculus, complex variables, statistics, optimization, and linear algebra.

The curriculum must include the application of knowledge of sensor technologies and computer science and engineering sciences.

The curriculum must include the design and analysis of complex electromechanical devices and associated software, as well as the design and analysis of systems containing hardware and software and that can interact with dynamic systems.

Faculty

The program must demonstrate that faculty teaching courses whose primary content is design are qualified to teach such subjects by virtue of their education and experience in design.

PROGRAM CRITERIA FOR
MINING ENGINEERING
AND SIMILARLY NAMED ENGINEERING PROGRAMS

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

Curriculum

The curriculum must include mathematics including differential equations, calculus-based physics, general chemistry, and probability and statistics with application to mining engineering problems.

The curriculum must include topics in geological sciences including mineral deposit characterization, physical geology, structural or engineering geology, and mineral and rock identification and properties.

The curriculum must include engineering topics such as statics, dynamics, strength of materials, fluid mechanics, thermodynamics and electrical circuits.

The curriculum must include engineering topics on 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.

The curriculum must include topics on complex engineering problems and engineering design tasks in such subjects as rock fragmentation, mineral or coal processing, mine surveying, mine valuation, resource or reserve estimation, mine sustainability, and mine automation, as appropriate to the program objectives.

The curriculum must include laboratory experiences in geological concepts, rock mechanics, mine ventilation, and other topics appropriate to the program objectives.

Faculty

The program must demonstrate that faculty who teach courses on mine ventilation and rock mechanics, as well as those courses whose primary content is design, are qualified to teach the subject matter by virtue of their professional license or educational background and design experience.

PROGRAM CRITERIA FOR NAVAL ENGINEERING AND SIMILARLY NAMED ENGINEERING PROGRAMS

These criteria apply to engineering programs that include “naval”, “naval architecture”, “marine”, “maritime”, “oceanic”, or similar modifiers in their names.

Curriculum

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

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

The curriculum of programs whose names contain the modifier “naval architecture” must also include hydrostatics, structural mechanics, properties of materials, energy or propulsion systems, and instrumentation appropriate to naval architecture.

The curriculum of programs whose names contain the modifiers “marine”, “maritime”, “naval” or similar, must also include energy or propulsion systems, properties of materials and instrumentation appropriate for marine engineering.

The curriculum of programs whose names include the modifier “oceanic” or similar must also include solid mechanics, hydrostatics, oceanography, water waves, and underwater acoustics.

Faculty

The program must demonstrate that faculty members stay up to date in their areas of expertise.

PROGRAM CRITERIA FOR NUCLEAR, RADIOLOGICAL ENGINEERING AND SIMILARLY NAMED ENGINEERING PROGRAMS

These criteria apply to engineering programs that include “nuclear”, “radiological”, or similar modifiers in their names.

Curriculum

The curriculum must include the following topics with sufficient depth for engineering practice: (1) mathematics for the analysis of complex nuclear or radiological problems; (2) atomic and nuclear physics; (3) radiation transport and interaction with matter; (4) nuclear or radiological systems and processes; (5) nuclear fuel cycles; (6) detection and measurement of nuclear radiation; and (7) design of nuclear or radiological systems.

Faculty

The program must demonstrate that faculty primarily engaged in the program have current knowledge of nuclear or radiological engineering through their educational background or experience.

PROGRAM CRITERIA FOR OPTICAL, PHOTONICS ENGINEERING AND SIMILARLY NAMED ENGINEERING PROGRAMS

These criteria apply to engineering programs that include “optics”, “photonics”, or similar modifiers in their names.

Curriculum

The structure of the curriculum must provide both breadth and depth across the range of engineering topics implied in the name 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 sciences, 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.

Faculty

The program must demonstrate that faculty who teach courses with significant design content are qualified to teach the subject matter by virtue of their design experience and subject matter knowledge.

PROGRAM CRITERIA FOR
PETROLEUM, NATURAL GAS ENGINEERING
AND SIMILARLY NAMED ENGINEERING PROGRAMS

These criteria apply to engineering programs that include “petroleum”, “natural gas”, or similar modifiers in their names.

Curriculum

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

The curriculum must include mathematics including differential equations, probability and statistics, fluid mechanics, strength of materials and thermodynamics.

The curriculum must include the design and analysis of well systems and procedures for drilling and completing wells.

The curriculum must include the characterization and evaluation of subsurface geological formations and their resources using geoscientific and engineering methods.

The curriculum must include the design and analysis of production, injection and fluid handling systems.

The curriculum must include the application of reservoir engineering principles and practices to optimize resource development and management.

The curriculum must include the use of project economics and resource valuation methods for design and decision making under conditions of risk and uncertainty.

PROGRAM CRITERIA FOR MINERAL PROCESSING, EXTRACTIVE METALLURGICAL ENGINEERING AND SIMILARLY NAMED ENGINEERING PROGRAMS

These criteria apply to engineering programs that include “mineral processing”, “extractive metallurgical”, or similar modifiers in their names.

Curriculum

The curriculum must include mathematics including differential equations, calculus-based physics, general chemistry, and probability and statistics with engineering applications appropriate to the name of the program.

The curriculum must include geological sciences, including general geology and mineralogy.

The curriculum must include the following engineering topics: (1) statics and fluid mechanics; (2) fundamental processing topics, including mass and heat balance, materials characterization and analysis, chemical or metallurgical thermodynamics, energy and mass transfer, and kinetic reactions; (3) process engineering topics, including flowsheet design, instrumentation and control, grinding, solid/liquid separation, and physical separations, including flotation; (4) other: materials handling and engineering economics.

The curriculum must include laboratory experiences in mineral processing, including laboratory methods, design of experiments, and computer software applications, depending on the name of the program.

The curriculum of programs that include the modifier “extractive metallurgical” or similar modifiers in their name must include hydrometallurgy, electrometallurgy, and pyrometallurgy, with appropriate associated laboratory experiences.

PROGRAM CRITERIA FOR
FIRE PROTECTION ENGINEERING
AND SIMILARLY NAMED ENGINEERING PROGRAMS

These criteria apply to engineering programs that include “fire protection” or similar modifiers in their names.

Curriculum

The curriculum must include topics on the application of science and engineering to protect the public health, safety, and welfare 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.

The curriculum must include topics on the application of the above four principles to solve field problems using computational, experimental, and performance-based design methods.

Faculty

The program must demonstrate that faculty remain current in the practice of fire protection engineering.

PROGRAM CRITERIA FOR
CHEMICAL, BIOCHEMICAL, BIOMOLECULAR ENGINEERING
AND SIMILARLY NAMED ENGINEERING PROGRAMS

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

Curriculum

The curriculum must include applications of mathematics, including differential equations and statistics, to engineering problems.

The curriculum must include college-level chemistry and physics topics, some of them at an advanced level, depending on the program objectives.

The curriculum must include the application of these sciences (chemistry and physics) to engineering for the design, analysis and control of processes, including the hazards associated with these processes.

The curriculum of programs whose names include the modifiers "biochemical", "biomolecular", or similar, must also include biologically based engineering applications, as appropriate to the name and program educational objectives.

PROGRAM CRITERIA FOR SOFTWARE ENGINEERING AND SIMILARLY NAMED ENGINEERING PROGRAMS

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

Curriculum

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

The curriculum must include topics on: (1) software requirements, (2) software architecture, (3) software design, (4) software construction, (5) software testing, (6) software engineering operations, (7) software maintenance, (8) software configuration management, (9) software engineering management, (10) software engineering process, (11) software engineering models and methods, (12) software quality, (13) software security, (14) software engineering professional practice, (15) software engineering economics, (16) computer science foundations, (17) mathematical foundations, and (18) engineering foundations.

The curriculum must include software engineering processes and tools appropriate for the development of complex software systems.

The curriculum must include discrete mathematics, probability, and statistics, with appropriate applications to software engineering.

Faculty

The program must demonstrate that faculty teaching software engineering core topics understand the professional practice of software engineering and remain current in their areas of professional or academic specialization.

PROGRAM CRITERIA FOR
TEXTILE ENGINEERING
AND SIMILARLY NAMED ENGINEERING PROGRAMS

These criteria apply to engineering programs that include “textile” or similar modifiers in their names.

Curriculum

The curriculum must include topics in mathematics, physics, chemistry and statistics.

The curriculum must include the application of advanced knowledge of mathematics including multivariable analysis, differential equations or linear algebra.

The curriculum must include the application of knowledge of mechanics, strength of materials, materials science and thermodynamics.

The curriculum must include the design of a product, process or system in the field of textile materials and technology.

The curriculum must include the measurement, control and technical analysis of the properties of textile materials and the variables of their production processes.

The curriculum must include the identification of changes during production and assess the effects of these changes on the behavior of the textile material.

The curriculum must include applications in at least one of the following basic technological areas: fiber, yarn, weaving, finishing or confection.

Faculty

The program must demonstrate that faculty members teaching courses whose primary content is design are qualified to teach such subjects by virtue of their educational and professional experience.

PROGRAM CRITERIA FOR
SURVEYING, GEOMATICS ENGINEERING
AND SIMILARLY NAMED ENGINEERING PROGRAMS

These criteria apply to engineering programs that include “surveying”, “geomatics”, or similar modifiers in their names.

Curriculum

The curriculum must include mathematics, including statistics, to support the analysis of complex surveying/geomatics problems.

The curriculum must include historical and legal elements of land ownership, particularly where surveying/geomatics are an integral part.

The curriculum must include science and data analysis for conformity of precision and accuracy.

The curriculum must include structure, format, storage, management, publication and visualization of data, and legal responsibilities related to the public.

The curriculum must include modern measurement and design technologies necessary to model, locate or construct elements on, under or at the Earth's surface.

The curriculum must include increased depth in a minimum of four subject areas, consistent with the program educational objectives, chosen from the following: (1) boundary or land surveying, (2) engineering surveys, (3) photogrammetry and remote sensing, (4) geodesy and geodetic surveying, (5) cartography, including map projections and coordinate systems, (6) geospatial data science and land information systems, (7) civil engineering topics that will help the student meet the requirements for professional licensure.

Faculty

The program must demonstrate that faculty who teach courses whose primary content is design or professional practice are qualified to teach such subjects by virtue of their professional license or educational and professional experience.

PROGRAM CRITERIA FOR TRANSPORTATION, TRAFFIC ENGINEERING AND SIMILARLY NAMED ENGINEERING PROGRAMS

These criteria apply to engineering programs that include “transportation”, “traffic”, or similar modifiers in their names.

Curriculum

The curriculum must include the application of knowledge of calculus, geometry and algebra, probability and statistics, and calculus-based physics.

The curriculum must include a solid foundation in engineering mechanics, engineering graphics, and operations research.

The curriculum must include the application of fundamental knowledge of civil engineering, mechanical engineering, electricity and electronics, computer technology and information control technology in transportation systems.

Faculty

The program must demonstrate that faculty members teaching courses whose primary content is design are qualified to teach such subjects by virtue of their educational and professional experience.

SUPPLEMENTARY CRITERIA

Each program must meet the supplementary criteria that it selects in its respective Request for Evaluation considering that:

1. **Criterion 10 – Research and Social Responsibility** is applicable in evaluations for initial accreditation purposes (new programs) and reaccreditation
2. **Criterion 11 – International Label of Educational Quality** is only applicable in the following cases:
   a. Evaluations for ICACIT Reaccreditation purposes.
   b. Evaluations of programs with current ICACIT Accreditation with at least two previous general evaluations.

The selection of a supplementary criterion in the Request for Evaluation implies that it will be considered in determining the final accreditation action of the program.

CRITERION 10. Research and Social Responsibility

The program must articulate the teaching-learning process with R&D&I&E and social responsibility activities, consistent with the program objectives, in which students and professors participate.

The program must manage, regulate and ensure the quality of the R&D&I&E carried out by the professors, related to the disciplinary area to which they belong, in coherence with the R&D&I&E policy of the institution.

The program must ensure the rigor, relevance and quality of the students' R&D&I&E work in order to obtain the bachelor degree and professional title.

The program must encourage the results of R&D&I&E work carried out by professors to be published, incorporated into teaching and made known to the academic community and students.

The program must identify, define and develop social responsibility actions linked to the comprehensive training of students.

The program must implement environmental policies and monitor compliance with prevention measures in this area.

CRITERION 11. International Label of Educational Quality

Student Workload Requirements: The program's curriculum must include a minimum of:

- 180 ECTS credits

EUR-ACE Graduates Attributes: The program must enable all graduates to demonstrate the following graduate attributes:

[EU-1] Knowledge and Understanding

EU-1.1 Knowledge and understanding of the mathematics, computing and other basic sciences underlying their engineering specialisation, at a level necessary to achieve the other graduate attributes;

EU-1.2 Knowledge and understanding of engineering fundamentals underlying their specialisation, at a level necessary to achieve the other graduate attributes, including some awareness at their forefront;

EU-1.3 Awareness of the wider multidisciplinary context of engineering.

[EU-2] Engineering Analysis

EU-2.1 Ability to analyse complex engineering products, processes and systems in their field of study; to select and apply relevant methods from established analytical, computational and experimental methods; to correctly interpret the outcomes of such analyses;

EU-2.2 Ability to identify, formulate and solve engineering problems in their field of study; to select and apply relevant methods from established analytical, computational and experimental methods; to recognise the importance of non-technical –societal, health and safety, environmental, economic and industrial - constraints.

[EU-3] Engineering Design

EU-3.1 Ability to develop and design complex products (devices, artefacts, etc.), processes and systems in their field of study to meet established requirements, that can include an awareness of non-technical – societal, health and safety, environmental, economic and industrial– considerations; to select and apply relevant design methodologies;

EU-3.2 Ability to design using an awareness of the forefront of their engineering specialisation.

[EU-4] Investigations

EU-4.1 Ability to conduct searches of literature, to consult and to critically use scientific databases and other appropriate sources of information, to carry out simulation and analysis in order to pursue detailed investigations and research of technical issues in their field of study;

EU-4.2. Ability to consult and apply codes of practice and safety regulations in their field of study;

EU-4.3 Laboratory/workshop skills and ability to design and conduct experimental investigations, interpret data and draw conclusions in their field of study.

[EU-5] Engineering Practice

EU-5.1 Understanding of applicable techniques and methods of analysis, design and investigation and of their limitations in their field of study;

EU-5.2 Practical skills for solving complex problems, realising complex engineering designs and conducting investigations in their field of study;

EU-5.3 Understanding of applicable materials, equipment and tools, engineering technologies and processes, and of their limitations in their field of study;

EU-5.4 Ability to apply norms of engineering practice in their field of study;

EU-5.5 Awareness of non-technical -societal, health and safety, environmental, economic and industrial - implications of engineering practice;

EU-5.6 Awareness of economic, organisational and managerial issues (such as project management, risk and change management) in the industrial and business context.

[EU-6] Making Judgements

EU-6.1 Ability to gather and interpret relevant data and handle complexity within their field of study, to inform judgements that include reflection on relevant social and ethical issues;

EU-6.2 Ability to manage complex technical or professional activities or projects in their field of study, taking responsibility for decision making.

[EU-7] Communication and Team-working

EU-7.1 Ability to communicate effectively information, ideas, problems and solutions with engineering community and society at large;

EU-7.2 Ability to function effectively in a national and international context, as an individual and as a member of a team and to cooperate effectively with engineers and non-engineers.

[EU-8] Lifelong Learning

EU-8.1 Ability to recognise the need for and to engage in independent life-long learning;

EU-8.2 Ability to follow developments in science and technology.

Program Educational Objectives: The program educational objectives should reflect the needs of employers and other stakeholders. The graduate's attributes should be demonstrably consistent with the program educational objectives.

Teaching and Learning Process: The teaching and learning process should enable the achievement of the graduate attributes. The program curriculum should specify how this will be achieved.

Resources: Program resources must be sufficient to enable the achievement of the graduate attributes.

Admission, transfer, progression and graduation of students: The criteria for admission, transfer, progression and graduation of students from the program must be clearly specified and published, and the results of these processes must be monitored.

Internal Quality Assurance: The program must be supported by effective quality assurance policies and procedures.

GLOSSARY OF TERMS

1. **ICACIT Accreditation:** ICACIT Accreditation is an audit of compliance with international standards of the *Washington Accord* and the *Sydney Accord* of the *International Engineering Alliance*, the *Seoul Accord*, the *Canberra Accord* and the *European Network for Accreditation of Engineering Education*, adopted by ICACIT.
2. **Initial ICACIT Accreditation:** It is the ICACIT Accreditation granted to a program for the first and only time, normally after its first evaluation, considering that it has not been granted ICACIT Accreditation in the past.
3. **Quality assurance:** Term referring to an ongoing and continuous process of evaluating (assessing, monitoring, ensuring, maintaining and improving) the quality of a higher education system, institution or programme. As a regulatory mechanism, quality assurance focuses on both accountability and improvement, providing information and judgements through a consistent process and well-established criteria. Quality assurance activities depend on the existence of the necessary institutional mechanisms preferably supported by a strong quality culture. Quality management, quality improvement, quality control and quality evaluation are means through which quality assurance is guaranteed.
4. **Graduate Attributes:** It is a set of individually measurable outcomes that describe what students are expected to know and be able to do upon graduation. Graduate attributes are clear and succinct statements that refer to the skills, knowledge, and behaviors that students acquire throughout their progress in the program.
5. **Self-Study:** It is the internal review process of the quality of a program that includes an analysis of its strengths and limitations.
6. **Academic quality:** It is defined as the level of achievement of the program objectives in accordance with the institutional mission and the needs of the constituents; which allows graduates to achieve the graduate attributes and enter professional practice.
7. **ICACIT evaluation cycle**: It is a series of activities organized between the months of January and December of each year to complete the evaluation process of a program in order to achieve ICACIT Accreditation.
8. **College-level basic sciences:** They are disciplines focused on the knowledge or understanding of the fundamental aspects of natural phenomena. They are an indispensable part of an engineering program and consist of chemistry, physics, as well as other natural sciences including life, earth and space sciences.
9. **Engineering sciences:** They are rooted in mathematics and basic sciences, but extend knowledge toward the creative application needed to solve engineering problems by providing the knowledge base for engineering specialties. These may include topics such as solid mechanics, fluid mechanics, thermodynamics, electrical and electronic circuits, computer science (except programming topics), materials science, soil mechanics, aerodynamics, control systems, among others, depending on the discipline.
10. **Advisory committee:** It is a consultative body whose main function is to advise the program in the periodic review of the curriculum and the establishment and review of its educational objectives. It is made up of professionals with extensive experience who come from professional organizations, industry and government.
11. **Student advising:** It is an educational service provided by qualified professionals that consists of a series of formal activities planned to accompany and guide students in achieving their goals.

12. **Constituencies:** People or group of people with certain characteristics who have an interest in the program's activities. These may be professors, students, employers, graduates, the advisory committee, and others that the program considers appropriate.
13. **ECTS credit:** One European Credit Transfer System (ECTS) credit is equivalent to 25 to 30 hours per semester of student workload. One academic year represents a total of 60 ECTS credits.
14. **Student performance:** It is the student's performance in the cognitive, affective and psychomotor areas.
15. **Critically dependent on one individual:** A program is critically dependent on a faculty member if an entire portion of the program is eliminated or severely degraded if that faculty member leaves.
16. **Engineering design:** It is a creative, iterative, decision-making process in which basic sciences, mathematics, and engineering sciences are applied to find viable solutions to a problem that does not necessarily have a single answer. This process includes conceptualizing ideas; identifying and formulating problems; comprehensively applying a variety of disciplines and technologies; creating ideas; identifying constraints and finding solutions to the problem under those constraints; verifying results; demonstrating ideas with plans, arguments, equations, or programs; communicating with others; collaborating with others (teamwork); and continually planning and implementing as planned. All of these tasks are expected to be performed in a holistic manner. Constraints encompass public health and safety, life-cycle cost, net zero carbon, resource, cultural, social, economic, and environmental issues.
17. **General education:** These are studies that provide an appreciation of the broader issues that enable graduates to practice professionally in society. These studies may include management, economics, law, history, finance or a foreign language.
18. **Inclusive education:** An education that promotes mutual respect and the value of all people and builds educational environments in which the approach to learning, institutional culture and curriculum reflect the value of diversity.
19. **Evaluation:** It consists of one or more processes designed to interpret the information and evidence accumulated through assessment processes. Evaluation determines the degree to which the graduate attributes and the program educational objectives are being achieved. Evaluation leads to decisions and actions to improve the program.
20. **ICACIT evaluator:** He/she is a distinguished professional in the areas of architecture, science, computing, engineering and engineering technology, coming from academia, industry and/or government, who has a vast experience in his/her professional field and who, in his/her role as a voluntary evaluator, conducts and/or manages the evaluation processes for ICACIT Accreditation purposes, based on the current ICACIT accreditation policies, procedures and criteria, playing an important role in promoting the continuous improvement of educational quality in higher education programs and being a protagonist in the improvement of his/her profession.
21. **Engineering management:** It refers to the generic functions of management (planning, organization, direction and control) applied together with engineering knowledge in contexts that include project management, construction, operations, maintenance, quality, risk, change and business.
22. **Graduate:** This is a student who has completed a program, fulfilling the established requirements, and has obtained the academic degree.
23. **R&D&I&E:** Research, development, innovation and entrepreneurship.
24. **Self-Study Report:** It is the primary document that each program uses to explain how it meets all applicable ICACIT accreditation criteria, policies and procedures. The self-study report forms the initial basis for determining whether the program meets ICACIT requirements.
25. **College-level mathematics:** Mathematics whose level of sophistication is at least equivalent to introductory calculus and is above the level of algebra and trigonometry. It represents a solid

foundation for the topics of the discipline and should emphasize mathematical concepts and principles, as well as numerical analysis. Some examples of college-level mathematics include: calculus, differential equations, probability, statistics, linear algebra, and discrete mathematics.

26. **Assessment:** It consists of one or more processes in which information is identified, collected, and prepared to assess the achievement of graduate attributes and program educational objectives. Effective assessment uses appropriate direct, indirect, quantitative, and qualitative measures relevant to the outcome being measured. Appropriate sampling methods may be used as part of a measurement process.
27. **Study modality**: It is the way in which the student learns, within an organized structure that determines the place, the means, the times and the forms of communication. The study modality can be face-to-face, blended or distance learning.
28. **Monitor:** It is a continuous and systematic process to verify that a certain process is carried out according to what is scheduled in order to achieve the objectives, without necessarily implying a response or action.
29. **Program educational objectives:** They are general statements that describe what graduates are expected to accomplish in the first few years after graduation. The educational objectives of the program are based on the needs of the program's constituencies.
30. **Postgraduate:** It is the level of higher education studies that leads to obtaining the consecutive academic degrees of master and doctor, after the undergraduate degree.
31. **Undergraduate:** It is the level of higher education studies that leads to obtaining the academic degree of bachelor.
32. **Complex engineering problems:** These are those that require deep fundamental and specialized knowledge of engineering, including scientific literature on the discipline; and have one or more of the following characteristics:
    - They are high-level problems including components or sub-problems;
    - They are unknown problems or those that involve uncommon aspects;

    and their solutions have one or more of the following characteristics:
    - are not obvious and require originality or analysis based on fundamentals
    - are outside the scope of norms, standards and codes;
    - involve diverse groups of stakeholders with very diverse needs;
    - involve wide-ranging or contentious issues: technicians, engineers and interested or affected parties.
33. **Documented and effective process:** That process that has a written and/or graphic description of how it is executed and is effective in a sustained manner over time.
34. **Program:** It is an organized and integrated educational experience that culminates with the attainment of an academic degree. The program will have educational objectives, graduate attributes, a curriculum, faculty, and facilities.
35. **Different programs:** Those programs that can be differentiated by the academic degree obtained upon completion and which specifies at which headquarters, branch, campus or location it is offered, in addition to the study modality in which it is offered.
36. **Social responsibility**: Social responsibility refers to the obligation of an organization's management towards the welfare and interests of the society in which it operates.
37. **Realistic constraints**: They address, as required, public health and safety considerations, life cycle cost, net zero carbon, resource, cultural, social, economic and environmental considerations.
38. **Wellness services:** Programs that manage health care services, health insurance, social assistance, scholarships, sports, arts, among others.

39. **Integrated information and communication system**: It is a set of elements and data that, through continuous and organized activities of the educational institution, keeps the educational institution and society informed through direct communication.
40. **Systematically:** Carried out continuously and periodically, based on a set of principles, standards, methods or procedures.

PROPOSED CHANGES TO THE ICACIT ACCREDITATION CRITERIA

Changes to ICACIT accreditation criteria may be proposed by the Accreditation Committees and must be approved by the ICACIT Board of Directors. Typically, changes to ICACIT accreditation criteria take effect in the evaluation cycle immediately following their approval. However, this period may be extended, where appropriate, and suggested changes may require a period for public review and comment prior to approval

The following section presents the proposed changes to ICACIT's accreditation criteria as approved by the ICACIT Board of Directors at its December 2023 session, for a review and comment period expiring on June 30, 2024. The ICACIT Board of Directors will determine, based on the comments received and the proposals of the Accreditation Committees, the content of the criteria to be adopted.

Comments related to the proposed changes must be sent in writing to Av. Del Pinar 152. Office 707. Santiago de Surco. Lima 033. Peru, or by email to acreditacion@icacit.org.pe.

Proposed Changes

No proposed changes to criteria have been determined.