



Criteria and procedures for accreditation

Of Engineering Careers 2025

Colegio Federado de Ingenieros y de Arquitectos

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Presentation

The Colegio Federado de Ingenieros y de Arquitectos de Costa Rica (CFIA), in response to global trends toward establishing accreditation systems for architecture and Engineering education programs, began a process in 1993 to develop an Accreditation System.

As a fundamental part of this process, with the evaluation of members of the Canadian Engineering Accreditation Board (CEAB), “substantially equivalent accreditation” was achieved for several engineering programs, under internationally recognized standards and procedures.

This process led to the generation of experience and technical training for a significant number of CFIA members, which has enabled the establishment of its own accreditation system, recognized by the International Engineering Alliance (IEA), as the CFIA and its accreditation agency, AAPIA, have been accepted as signatory members of the Washington Accord and the Lima Accord.

For CFIA and its member associations: Colegio de Ingenieros Civiles, Colegio de Ingenieros Topógrafos, Colegio de Ingenieros Electricistas, Mecánicos e Industriales, Colegio de Ingenieros Tecnólogos, Chamber of Industries of Costa Rica, Costa Rican Chamber of Construction, and Accreditation Council, it is with great satisfaction that we present the “Criteria and Procedures for the Accreditation of Engineering Programs 2025.” We are confident that this document will contribute significantly to improving the quality of engineering education in Costa Rica.

Similarly, with the implementation of this manual, a significant and momentous step is being taken in the CFIA’s responsibility to stimulate the continuous improvement of engineering study programs and ensure the Costa Rican community the foundations for rigorous, ethical, and efficient professional practice.

Accreditation Council. San José, Costa Rica, December 2024

Approval of Signatory Status

Confirmation of outcomes from the Washington Accord Meeting



I write to formally advise you of the outcome of the closed session of the Washington Accord meeting held on Monday 22nd June 2020.

The Washington Accord Executive Committee would like to thank our CFIA colleagues for their engagement with the IEA and participation at the virtual IEAM2020.

We are pleased to advise that the Washington Accord Signatories agreed that CFIA be made a Signatory of the Washington Accord. Recognition of the substantial equivalence of CFIA's accredited programs by other Signatories begins one year prior to the date of admission to Signatory status.

Congratulations to all our colleagues at CFIA. We can confirm that the IEA website has been updated to reflect the Signatory status of Costa Rica, represented by CFIA.

Should you have any questions regarding this letter please contact the IEA Secretariat directly in writing.

Yours Sincerely,

A stylized, dark ink signature of Em Prof Elizabeth Taylor, consisting of several horizontal strokes.

Em Prof Elizabeth Taylor

WA Executive Committee Chair

A stylized, dark ink signature of Prof Kai Sang Lock, featuring a large 'K' and 'S' followed by 'Lock'.

Prof Kai Sang Lock

WA Executive Committee Deputy Chair

1. Description of the Agency.

1.1 AAPIA: The Accreditation Agency for Engineering and Architecture Programs (AAPIA) is a body of the Colegio Federado de Ingenieros y de Arquitectos de Costa Rica (CFIA), established by agreement of CFIA General Board of Directors (JDG) to develop quality assessment processes in the academic field of higher education for engineering, architecture, and related disciplines.

1.2 Accreditation process: This is an evaluation process that seeks to determine whether an engineering or architecture training program meets the quality standards established to ensure relevant training. To this end, an accreditation model, criteria, and procedures based on the good practices established by the International Engineering Alliance, defined in the Washington Accord and endorsed by the Lima Accord, are used.

The accreditation criteria include the evaluation of graduate attributes, continuous improvement, policies and procedures to support the student training process, the academic curriculum, and the program environment.

The CFIA's Engineering and Architecture Program Accreditation Council is the body responsible for administering the accreditation process for engineering and architecture programs in Costa Rica, in compliance with the primary purposes stipulated in Article 4 of the CFIA's Organic Law, which establishes in paragraphs a) and c):

- To stimulate the progress of Engineering and architecture, as well as the sciences, arts, and crafts related to them.
- Promote the educational, social, economic, technical, artistic, and legal conditions necessary for the evolution of the professions that comprise it and cooperate with state and private institutions in everything that involves improving the country's development.

1.3 Historical summary of the Agency: On July 3, 1903, by means of Decree Law No. 34, the Technical Faculty of the Republic was created, which later became the Colegio

Federado de Ingenieros y de Arquitectos (CFIA) by Law of the Republic No. 4925, of December 17, 1971.

In February 1993, under the auspices of UPADI (Unión Panamericana de Asociaciones de Ingenieros), the “First Pan American Seminar and First National Congress on Institutional Evaluation and Accreditation of Engineering Education” was organized, marking the beginning of the CFIA’s participation in the analysis of accreditation processes.

With the Support of the Canadian International Development Agency (CIDA), the collaborative project entitled “Accreditation of Engineering Education Programs in Latin America” was implemented during the period from 1994 to 1997. This effort had the following goal: “To help create a framework for the accreditation of engineering education programs in Latin America and to encourage the creation of accreditation systems.”

On May 22, 1996, CFIA licensing and accreditation committee was formally established, holding its first meeting on June 5. It immediately focused its attention on holding the “Seminar Workshop: Accreditation Process for Engineering and Architecture Degrees” on November 22, 23, and 24 of that year. As a result of this activity, the first proposal for an accreditation manual was obtained.

The CFIA Assembly of Representatives, in its session No. 07-96/97 G. E., agreed on July 28, 1997, to create a Permanent Joint Commission to be responsible for all accreditation processes for engineering and architecture programs.

Through Agreement No. 23 of Session No. 33-97/98-G.E., dated October 22, 1998, the CFIA’s Executive Board agreed to create the Accreditation Council, which was consolidated years later with the establishment of AAPIA.

On the other hand, the efforts of this Joint Accreditation Committee (CPA) resulted in the first engineering program being accredited as “substantially equivalent” in September 1999, under the criteria and procedures of the Canadian Engineering Accreditation Board (CEAB). From this process onwards, the evaluation visit of a

program is carried out by two evaluation teams: one team from the CEAB and another team called the “parallel team” or “shadow team” from CFIA’s CPA.

Under this modality, more than 20 joint evaluation visit processes were carried out at three public universities and three private universities, and 12 engineering programs were accredited.

For architecture, the initiative sought Good accreditation practices from the National Architectural Accrediting Board (NAAB) and the provisions of the UIA-UNESCO Charter for Architectural Education.

On June 26, 2003, CFIA’s Executive Board agreed to establish the Professional Training Department (DFP) as the organizational body responsible for formal links with the academic sector and for implementing the agreements arising from the CPA, which began work in 2004.

In June 2004, CFIA General Board of Directors, at its meeting No. 27-03/04-GE, agreed to establish the Accreditation System of the Colegio Federado de Ingenieros y de Arquitectos as a body under its authority.

In August 2004, within the framework of the First Central American Forum for Accreditation, CFIA, in collaboration with CSUCA, REDICA, inWent, and the DAAD, established a pro-tempore commission for the creation of a specialized accreditation agency for Engineering and Architecture, which would be finalized in 2006 with the establishment of the Central American Agency for the Accreditation of Architecture and Engineering Programs (ACAAI).

By Agreement No. 8 of Session 02, 05/06 of CFIA’s GBD, in November 2005, Addendum No. 1 to the Cooperation Agreement signed between the CFIA and the National Higher Education Accreditation System (SINAES) was approved, establishing the AAPIA as a joint accreditation agency for Architecture and Engineering programs, in which the CPA would represent CFIA.

At its meeting on August 31-05/06, 2006, CFIA's GBD, through Agreement No. 13, approved: "(...) to delegate to the Accreditation Agency for Engineering and Architecture Programs (AAPIA) the recommendations for technical resolutions on accreditation matters."

In 2008, a Memorandum of Understanding was signed between CFIA and Engineers Canada, which states: "CEAB agrees to provide CFIA with the technical assistance required to draft and implement its own accreditation system (...)" and that "Engineers Canada undertakes to assist the future Costa Rican accreditation system in achieving membership in the Washington Accord."

In June 2015, at the general meeting of the International Engineering Alliance, held in Istanbul, Turkey, CFIA was unanimously accepted as a provisional member of the Washington Accord. The application was submitted by Engineers Canada and seconded by Engineers Ireland.

On June 22, 2020, at the International Engineering Alliance's general meeting, held virtually, CFIA was unanimously accepted as a signatory member of the Washington Accord.

In December 2020, the presidency of the Lima Alliance ratified the full membership of CFIA and its accreditation agency within this Latin American body.

In September 2023, within the framework of the 20th Assembly of the Ibero-American Network for Quality Assurance in Higher Education (RIACES), AAPIA was accepted as a full member.

1.4 Mission and Vision.

1.4.1 Mission: To contribute to the continuous improvement of academic programs in Engineering and Architecture through accreditation processes.

1.4.2 Vision: To be the guarantor of quality assurance for academic programs in Engineering and Architecture in Costa Rica.

1.4.3 Quality Policy: We strive to provide accreditation services for engineering and architecture programs that meet the needs and expectations of higher education institutions, based on internationally recognized best practices, the principles and values of CFIA, and a commitment to continuous improvement.

1.5 Accreditation objectives:

- To assure the national and international community that a program of study meets the criteria established to provide relevant training that enables its graduates to apply for a license to practice engineering or architecture in Costa Rica.
- To stimulate the continuous improvement of the Engineering and Architecture study program.
- Facilitate the recognition of studies completed in other countries for the authorization of professional practice, within the provisions of the conventions, treaties, bilateral or multilateral agreements signed by the country.

1.6 Policies and values.

1.6.1 Policies: The strategies that guide the actions of CFIA Accreditation Agency are as follows:

- Accreditation is conceived as a process based on the search for understanding, which aims at improvement and is carried out through dialogue.
- It is recognized that the quality assurance of educational processes, their inputs, outcomes, and contexts are the primary responsibility of higher education institutions.
- The autonomy, identity, and integrity of institutions are deeply respected.
- The requirements of accountability, transparency, and respect lead to consultation with the various stakeholders in the accreditation processes of engineering training programs, as well as in the definition of accreditation criteria and procedures.

- The aim is to contribute both to improving the quality of programs and to their accountability to society, to which they are responsible.

1.6.2 Principles of value:

All persons involved in the accreditation processes must, in the exercise of their functions, guide their actions, words, and decisions by the following axiological principles:

Value	Definition
1. Commitment	Dedication and loyalty to the objectives and responsibilities acquired in the academic and professional spheres.
2. Trust	Belief in the integrity and ability of others to fulfill their responsibilities competently and ethically.
3. Confidentiality	Protection of sensitive and private information, preventing its unauthorized disclosure.
4. Fairness	Fair and impartial treatment of all people, ensuring equal opportunities and rights in the academic environment.
5. Honesty	Acting with integrity and truthfulness, avoiding deception and falsification in all actions and decisions.
6. Impartiality	Making decisions and taking actions without favoritism or prejudice, ensuring fairness and objectivity.
7. Independence	The ability to act without undue influence from third parties, maintaining autonomy in decisions.
8. Objectivity	Evaluating and acting based on facts and evidence, without allowing emotions or prejudices to influence.
9. Respect	Recognition and consideration of the rights, opinions, and dignity of others.

Value	Definition
10. Responsibility	Fulfilling duties and obligations, accepting the consequences of one's actions.
11. Transparency	Openness and clarity in actions and decisions, facilitating access to relevant information.
12. Dialogue	Open and constructive communication between parties, promoting understanding and conflict resolution.

1.6.3. Conflict of interest policy:

Those who do not have a conflict of interest or particular situation that contravenes the policies, principles of value, or rules of conduct stipulated in this manual or in the instruments derived from it may participate as members of the Accreditation Council, technical committees, peer reviewers, or observers of accreditation processes.

2. Organization of the Agency.

2.1 Constitution of the Agency:

2.1.1 Nature: CFIA and its accreditation agency, AAPIA, are non-governmental civil society organizations created by law of the republic, with legal status, assets, and their own governance.

2.1.2 Legal basis: CFIA's accreditation agency, as a body of this organization, is constituted under the provisions of section c, article 4, chapter 2 of the Organic Law of the Colegio Federado de Ingenieros y de Arquitectos de Costa Rica, of December 17, 1971, which states: *"To promote the educational, social, economic, technical, artistic, and legal conditions necessary for the evolution of the professions that comprise it and to cooperate*

with state and private institutions in everything that involves improving the country's development."

2.1.3 Management, control, and oversight: These functions shall be carried out by the following bodies: the Assembly of Representatives, CFIA General Board of Directors, the Accreditation Council, the Technical Committees, and CFIA Executive Directorate.

2.1.4 The Assembly of Representatives: This is the highest authority of CFIA. It is responsible for approving the guidelines, policies, and annual budget of CFIA and the Accreditation Agency.

2.1.5 The General Board of Directors (GBD): Responsible for the overall management of CFIA. It is made up of two representatives from each of the member associations, and all members must be professionals in engineering or architecture. Members of the GBD remain in office for two years and may be re-elected.

It is responsible for overseeing the functions of the Accreditation Agency. It delegates all matters relating to the administration of accreditation processes to CIFA Accreditation Council, without prejudice to the powers conferred on it by law. In addition, it approves the Council's extraordinary budgets, in accordance with the provisions of CFIA Organic Law.

2.1.6 CFIA Accreditation Council: This is a permanent body of CFIA, made up of 14 full members, each with the right to speak and vote. Its composition is as follows: Two representatives from each of the five member associations of CFIA: Colegio de Ingenieros Civiles (CIC), Colegio de Arquitectos de Costa Rica (CACR), Colegio de Ingenieros Electricistas, Mecánicos e Industriales (CIEMI), Colegio de Ingenieros Topógrafos (CIT), Colegio de Ingenieros Tecnólogos (CITEC), two representatives from the Costa Rican Chamber of Construction (CCC), and two representatives from the Costa Rican Chamber of Industries (CICR). All members of the Accreditation Council must be professionals in engineering or architecture.

The members of the Accreditation Council shall remain in office for a period of three years and may be re-elected for a maximum of two additional consecutive terms, for a maximum of nine years.

The positions of president and vice president of the Accreditation Council shall have a term of two years and may be re-elected for a maximum of two consecutive terms.

The functions of the CFIA Accreditation Council are:

- To administer the accreditation processes for Engineering and architecture programs.
- Define the policies, criteria, and procedures for accreditation.
- Inform higher education institutions and the community at large about accreditation policies, criteria, and procedures.
- To supervise the work of the evaluation teams and the organization's staff.
- To train and certify competent evaluators in the accreditation processes.
- Keep up to date with the state of the art in education, accreditation, and the practice of engineering and architecture.
- Recommend cooperation or mutual recognition agreements with accreditation organizations to CFIA's Executive Board.
- Recommend cooperation agreements with accreditation agencies from other professions to CFIA's Executive Board.
- Appoint teams of evaluators to visit Engineering and architecture programs participating in accreditation processes.
- Evaluate Engineering and architecture programs for accreditation in accordance with established policies, criteria, and procedures.
- Decide the period of time for which accreditation is granted to each study program.
- Review and decide on appeals filed by program authorities.
- Participate in national and international forums, seminars, and conferences related to quality assurance in academia.

- Collaborate with counterpart organizations with which agreements have been signed in the development of mutually acceptable standards and criteria, as well as in the exchange of experiences that encourage good practices in accreditation.
- Support, advise, and participate in accreditation processes outside Costa Rica.
- Advise higher education institutions offering Engineering and architecture programs on general accreditation matters.
- Provide information on accredited Engineering and architecture study programs.

2.1.7 Technical committees: There are two technical committees, one for engineering and one for architecture, made up of CFIA-registered professionals with experience and knowledge in program accreditation matters. Each technical committee will be coordinated by a member of the Accreditation Council. The main functions of the technical committees are:

- To update the accreditation criteria and procedures manuals, as well as the related assessment tools.
- Participating in training activities related to the accreditation processes.
- To be part of the visiting teams, if so determined by the CFIA Accreditation Council.
- Contributing to the evaluation of the progress of improvement projects presented by accredited programs.

2.1.8 CFIA Executive Directorate: The executive function of the Accreditation Agency is the responsibility of the CFIA's executive director, who may delegate it to the person responsible for the administrative management of the accreditation agency.

2.1.9 Head of Engineering Processes: Responsible for the following functions:

- Comply with the policies established by the CFIA Accreditation Council, the General Board of Directors, and the Assembly of Representatives, and ensure their enforcement.
- To execute all agreements made by the CFIA Accreditation Council.

- Planning, organizing, coordinating, and executing all matters related to the operation of the CFIA Accreditation Agency, in accordance with laws, regulations, and agreements. This includes: operational plan, budget, work report, regular and special meetings of the CFIA Accreditation Council, liaison with accreditation agencies, and updating of criteria and procedure manuals.

3. Accreditation of Engineering study programs.

3.1 Definition: Accreditation is a periodic process of evaluating an educational program, which ultimately allows for a judgment to be made on the value and merit of its quality and ensures that it meets the minimum conditions necessary to provide relevant academic training in a professional discipline.

As an evaluation process, it involves the structured and reflective analysis of relevant information about the program under study, which is grouped into categories or evaluation components, whose combination and interactions represent the program. This information is interpreted in light of a reference framework composed of criteria, indicators, and minimum benchmarks considered appropriate for assessing the quality of the program.

If a study program is accredited, it means that an authorized educational organization, through clearly established rules and using appropriate resources, meets or exceeds the minimum requirements for training people in the specified field. This is publicly guaranteed by an accrediting body, which in this case is the Accreditation Agency of the Colegio Federado de Ingenieros y de Arquitectos.

3.2 Stages of accreditation: From the evaluators' point of view, accreditation has three stages: internal evaluation or self-evaluation, external evaluation or hetero-evaluation, and finally, meta-evaluation or synthesis evaluation.

Self-evaluation is carried out by the “university agents” themselves, who are responsible for the study program, and its immediate purpose is the continuous improvement of the program, as well as the preparation for external evaluation.

The hetero-evaluation is carried out by “external academic and professional peers,” considered qualified evaluators who, from the objectivity provided by their position, have the responsibility to issue an evaluative report on the program under review, indicating whether or not it complies with the established criteria. The report is submitted to the Accreditation Council of CFIA, which must render a decision regarding

the status of the evaluated program and inform the CFIA's General Board of Directors accordingly.

Meta-evaluation (evaluation of the evaluation) is carried out on the process undertaken, with the aim of continuously improving it. It is the responsibility of the accreditation agency involved to develop it, as part of its internal quality assurance system.

3.3 Purpose of accreditation: The general purpose of accreditation is to identify, according to established criteria, engineering programs in which graduates have been trained for the relevant practice of the discipline and, therefore, possess the necessary initial competencies for professional practice in the particular field of engineering, consistent with the degree received, and are therefore eligible to apply for the respective license.

The CFIA establishes that its members must be competent in their discipline and understand the impact of professional practice on society and the environment. For this reason, the accreditation process must indicate which program provides an adequate level of engineering content and promotes the development of the skills, abilities, and values that enable graduates to perform successfully, under solid ethical principles and with a commitment to sustainable development.

3.4 General characteristics of the process: Accreditation is voluntary and is only carried out when requested by the authorities of the institution offering university-level engineering programs.

Accreditation is granted to individual Engineering programs; it is not granted to departments, faculties, or universities as a whole.

The accreditation status and duration are decided by the CFIA Accreditation Council, based on the evaluation of the information provided by the program administrators, the peer review report, and the improvement plan submitted.

The accreditation process integrates and articulates quantitative and qualitative criteria.

The accreditation process is characterized by its respect for the idiosyncrasies and particularities of each program, but it requires compliance with established standards.

The information submitted by the authorities of a program under evaluation must be complete, clear, truthful, objective, and relevant. Failure to comply with any of these aspects may result in the nullity of the process and the need to start a new one.

The evaluation is carried out by a team of peers who may come from both academia and industry.

The information provided by the peer evaluators must be complete, clear, truthful, and objective, to allow for an adequate assessment of the study program in terms of accreditation.

Both the information provided by the authorities in charge of the program under evaluation and that provided by the peer evaluators, as well as the deliberations within the CFIA Accreditation Council, are confidential.

Only the names of programs that meet the accreditation criteria and, therefore, in the opinion of the CFIA Accreditation Council, hold accredited status, as well as the period of validity of this status, are made public.

Any change in the program that alters the conditions under which it was accredited must be reported to the CFIA Accreditation Council, which will decide whether or not a new evaluation process is necessary.

For accreditation purposes, a program is characterized by a formally approved and published academic curriculum, which is considered as an entity by the institution and can be considered independently. All program options are examined according to the principle that a program is only as strong as its “weakest link”; a program is accredited if and only if all training paths, options, or emphases meet the established accreditation criteria.

If the program is offered at different locations or campuses, either partially or in full, the evaluation visit will only include the locations for which the corresponding evaluation has been requested. In such cases, the accreditation criteria must be met at all locations or campuses to be evaluated.

The CFIA Accreditation Council does not evaluate or accredit degrees, diplomas, certificates, or components thereof that are not in engineering; only engineering degrees will be announced in the annual report on accredited programs.

The CFIA Accreditation Council must have evidence that the degree options offered by the program each contain significantly different curricular content and that the name of the option accurately describes the curricular content.

The CFIA Accreditation Council must have evidence that the name of the program is appropriate for all of its options.

Accreditation is granted for a limited number of years, which may be from three to six years maximum. The number of years of accreditation is based on the value and merits demonstrated by the program in meeting the accreditation criteria and the autonomous decision of the CFIA Accreditation Council.

3.5 General evaluation categories: The program is analyzed by breaking it down, for evaluation purposes, into segments that interact with each other, each with its own characteristics that differentiate it from the others. These segments are referred to here as categories.

The set of categories, with their interactions, represents the program. The goal of the evaluation process is to assign a “quality value” to each of the categories and, from there, infer the overall quality of the program.

3.5.1 Evaluation categories:

3.5.1.1 Definition: An evaluation category is the analytical division used to determine the value and merit of an aspect that characterizes an educational process. It comprises a specific set of criteria, indicators, and standards that are used to analyze, measure, and rate the effectiveness and compliance of an academic program, ensuring that it meets the necessary conditions for relevant education.

The established evaluation categories are:

- **Curriculum:** A structured set of subjects, objectives, content, resources, activities, and learning assessment strategies that define the academic training a student must follow to obtain an academic degree in disciplinary field.
- **Academics:** Evaluation of the qualifications, experience, continuing education, and performance of individuals who participate in substantive academic functions: teaching, research, community outreach, links with the productive sector, and innovation.
- **Infrastructure:** Physical and technological resources available and common spaces that support the educational process.
- **Program administration:** Organization, management, and internal policies of the institution that ensure the proper academic and administrative functioning of the study program. This includes management processes, decision-making, and support for the academic community.
- **Students and graduates:** Evaluation of the means and resources that enable compliance with the admission profile, vocational consolidation, student retention and performance, as well as the engagement and feedback of graduates of the educational program.

3.6 Entry requirements: In order to carry out the accreditation visit, the initial requirement must first be met. These requirements are: authorization of the degree program, academic degree, title, and program graduates.

3.6.1 Authorization to operate:

3.6.1.1 Only degree programs authorized by the competent body in the country are subject to accreditation. Therefore, the agreement number and date of authorization to operate must be indicated.

3.6.2 Level, academic degree, and title:

3.6.2.1 The academic level of the curriculum must be university level and correspond to a second-level or degree program (bachelor's degree).

3.6.2.2 The authorized academic degree and title must be indicated, in accordance with the nomenclature of degrees and titles in higher education.

3.6.2.3 For the purposes of national and international recognition under the Washington Accord (WA), only programs that award a bachelor's degree are accredited.

3.6.2.4 For the purposes of national recognition, programs that grant a bachelor's degree may be accredited.

3.6.2.5 Baccalaureate programs are accredited provided that they are recognized for professional practice by the CFIA or the corresponding professional association.

3.6.2.6 Individual programs with an academic degree of Bachelor's may only be accredited if they do not offer the academic level of Licentiate.

3.6.2.7 If a degree program offers both academic degrees, the accreditation process for the Bachelor's degree includes the Bachelor's degree, on the understanding that it is a single training program.

3.6.3 Name of the program: It must correspond to and be consistent with the nature of the program, and explicitly indicate in the title of the diploma awarded that it is an engineering program. The title of the program must be descriptive of the content of the curriculum.

3.6.4 Cohort of graduates: The program under evaluation must have at least one cohort of graduates with the corresponding academic degree. For new programs, the evaluation may be carried out when students are in their final academic cycle, so that the accreditation decision coincides with the graduation process.

4. Accreditation criteria.

4.1. Curriculum (Curricular content): From a comprehensive perspective, the curriculum **must** provide the curricular elements that enable appropriate training in all aspects that qualify students for relevant professional practice when they enter the labor market.

A. General aspects

The training process **must** seek to continuously improve the curriculum and ensure that its objectives are relevant.

4.1.1 Commitment to improving the curriculum: The program being accredited **must** be committed to the continuous improvement of the curriculum.

4.1.1.1 It **must** have effective processes and instruments for periodic review of the academic curriculum, which effectively incorporates representatives of different stakeholders.

4.1.1.2 The objectives and content of the program **must** be up to date with the state of the art (or knowledge) of the profession.

4.1.2 Curriculum orientation: The program must have an explicit curriculum orientation, expressed in its objectives.

4.1.2.1 The general objectives of the curriculum **must** be clear, relevant to the nature of the program's subject matter, and aligned with the intended training.

4.1.2.2 The contribution made by the different subjects in the academic curriculum to the achievement of the general objectives of the curriculum **must** be explicit.

4.1.2.3 Some of the learning objectives, content, and activities of selected subjects **must** integrate aspects related to the attributes of graduates. **It must** be verified that all attributes are included in the curriculum.

4.1.2.4 The learning objectives, content, and activities of selected subjects **must** integrate elements related to sustainable development goals, particularly those relevant to the professional field of the degree program.

4.1.2.5 The orientation of the curriculum **must** be known to those who make up the academic community: teachers, students, and administrative staff.

B. Academic professional profile

The training provided by the academic curriculum should provide a broad-based foundation for engineering practice ().

The evaluation of the academic-professional profile focuses on the attributes of graduates, which should guide the program's educational efforts so that the planning, implementation, and evaluation of teaching activities take into account the learning outcomes that demonstrate the achievement of the skills implied by the attributes of graduates.

4.1.3 Graduate attributes: The program must have relevant and effective policies and actions in place to incorporate all graduate attributes into the educational process of the program being accredited, regardless of the degree level (see definitions and types of attributes in the glossary of terms and concepts).

4.1.3.1. The organization and process followed for the incorporation of attributes **must** be indicated.

4.1.3.2 The commitment of authorities, academics, and students to adopt the attributes approach in the educational process **must** be demonstrated.

4.1.3.3 The mapping of attributes **must** be presented in the academic curriculum. This mapping **must** indicate at least in which subject and in which academic cycle a given attribute is developed or evaluated, as well as the corresponding level of expected development: initial, intermediate, or advanced.

4.1.3.4 There **must** be means, tools, and indicators to verify the achievement of each of the attributes, as well as the results obtained from their application.

4.1.3.5 The program **must** demonstrate the actions taken based on the results obtained in the evaluation of the incorporation of the attributes and the improvement in the educational process.

4.1.4 Curriculum structure: The curriculum structure or “curriculum grid” of the study plan graphically represents the complete range of subjects and the relationship between them, the disciplinary areas, and the cross-cutting themes established therein.

4.1.4.1 The curriculum structure or “curriculum grid” of the study plan **must** be relevant to the nature and subject matter of the educational process.

4.1.4.2 The areas of development or thematic areas, cross-cutting themes (if any), subjects common to other engineering programs (common core), as well as the organization and sequence of subjects **must** be presented.

4.1.4.3 It is advisable for the curriculum to include optional or elective courses or subjects that enable the particular educational interests of the student body to be addressed, that are relevant to the emerging demands of the labor market, or that highlight areas of emphasis in the training.

4.1.4.4 The authorities and academics of the program **must** supervise and monitor that the objectives and content studied in all areas of the program are relevant, up-to-date, and sufficient to promote the achievement of the attributes of graduates and contribute to the growth of commitment to sustainable development goals.

4.1.5 Duration of the curriculum: The total duration of the curriculum must enable the achievement of the established learning objectives, the understanding of the study content, the advanced development of the attributes of graduates, and a commitment to sustainable development. The calculation applies differently to face-to-face training processes than to those offered remotely or virtually, whether synchronous or asynchronous (See definition and calculation process in the glossary of terms and concepts).

4.1.5.1 The total duration of the curriculum must be at least equivalent in terms of teacher-student interaction time or scheduled training activities to 2,250 accreditation units (AU) for a bachelor’s degree and 1,800 accreditation units (AU) for an associate’s degree.

C. Minimum components of the curriculum

For evaluation purposes, the contents of the subjects in the curriculum must be grouped and meet the established minimums of teacher-student interaction or scheduled educational activity in five categories: Mathematics, Natural Sciences, Engineering Sciences, Engineering Design, and complimentary studies.

4.1.6 Mathematics (MT): The curriculum **must** include sufficient time for teacher-student interaction or scheduled educational activities in the area of mathematics at the university level to support engineering education.

4.1.6.1 The program **must** have a minimum of 225 AU. This applies to both bachelor's and master's degrees.

4.1.6.2 The minimum content that the curriculum **must** include in the area of mathematics is: Differential and Integral Calculus, Linear Algebra, Differential Equations, Numerical Analysis, Probability, and Statistics.

4.1.7 Natural sciences (NS): The curriculum **must** include sufficient time for teacher-student interaction or scheduled educational activities in the area of Natural Sciences at the university level to support engineering education.

4.1.7.1. The program **must** have a minimum of 225 AU in the area of Natural Sciences for both Bachelor's and Bachelor's degrees.

4.1.7.2. The minimum content that the curriculum **must** have in the area of Natural Sciences is: Classical Physics, General Chemistry, Biology, and Geosciences (the latter two if they apply to the program).

4.1.7.3. Relevant and appropriate laboratory, workshop, or field experience **must** be ensured to complement the theoretical aspects of the subjects.

4.1.8 The combination of mathematics and natural sciences (MT+CN) content: This **must** be at least 495 AU, leaving 45 AU for any combination deemed appropriate, both for bachelor's degrees and high school diplomas.

4.1.9 Engineering Sciences (ES): The curriculum **must** include sufficient time for teacher-student interaction or schedules training activities in the field of engineering sciences at the university level to support relevant training in the specific field of the profession involved.

4.1.9.1. The curriculum **must** include teacher-student interaction time in the area of engineering sciences equivalent to no less than 315 AU, for both bachelor's and master's degrees.

4.1.9.2. The minimum content **must** be relevant to the field of professional activity specific to the corresponding engineering discipline (see glossary of terms and concepts).

4.1.9.3. Adequate laboratory, workshop, or field experience **must** be ensured that is relevant and serves as a complement to the theoretical aspects of the subjects.

4.1.9.4. It is advisable to include content from other Engineering professions, other than those specific to the program, which enable assessment and exposure to a multidisciplinary perspective.

4.1.10. Design (DI): The curriculum **must** include time for teacher-student interaction or scheduled training activities in the area of engineering design at the university level, sufficient to support relevant training in the specific field of the profession involved.

4.1.10.1. The curriculum **must** include teacher-student interaction time or schedules training activities in the area of Engineering Design equivalent to no less than 315 AU, for both Bachelor's and Master's degrees.

4.1.10.2. The minimum content **must** be relevant to the fields of professional practice specific to the corresponding engineering discipline.

4.1.10.3. Adequate laboratory, workshop, or field experience **must** be ensured to complement the theoretical aspects of the subjects.

4.1.10.4 In developing the Engineering Design content of the curriculum, relevant modern engineering tools and instruments **should** be used.

4.1.11 The combination of engineering science and Engineering design content (CI+DI):

This must be at least 990 AU, for both Bachelor's and Bachelor's degrees, leaving 360 AU for any combination deemed appropriate.

4.1.12. Complementary studies (EC): The curriculum must include time for teacher-student interaction or scheduled training activities that enable comprehensive training.

4.1.12.1. The curriculum **must** include time for teacher-student interaction or scheduled educational activities in the area of complementary studies equivalent to no less than 315 AU, both for bachelor's and high school degrees.

4.1.12.2. The curriculum **must** include objectives, content, and learning experiences that enable comprehensive training, complement the technical aspects of the program, promote the development of the attributes of the corresponding graduates, and foster growth in commitment to sustainable development. (See glossary of terms and concepts).

4.1.13 Meaningful design experience: Regardless of the type of degree or final academic qualification, the training process **must** culminate in a meaningful design experience, which may take the form of a final project or piece of work for graduation.

4.1.13.1 The experience **must** be relevant, provide the opportunity to integrate the knowledge and skills acquired throughout the training process, and expose students to the concepts of teamwork, project management, and sustainable design.

4.1.13.2 This experience **must** be supervised and evaluated by a licensed teacher who is qualified to practice engineering or another relevant professional discipline, as established by applicable legislation.

4.1.14. Safety training: All students in particular and the academic community in general **must** be provided with adequate training in aspects related to personal safety, applicable in the various institutional spaces and in the development of training activities in laboratories, workshops, fieldwork, and professional internships.

4.1.14.1 Training **must** include instruction in safety principles, standards, procedures, and equipment.

4.1.14.2 It is advisable to form teams or brigades to respond to emergencies.

D. Training process: The various training activities should contribute to the achievement of the skills required to begin a relevant professional practice and be based on an approach that makes it possible to verify what a student should be able to know, understand, do, and value as a result of the training received.

4.1.15. Training strategies: It **must** be verified that the teaching and learning training strategies are consistent with the requirements for the start of professional practice, in particular with the attributes of graduates, and that they contribute to the commitment to sustainable development.

4.1.15.1 Training activities **must** enable experiences in line with the requirements for the start of professional practice, prioritizing the committed participation of students in their training process.

4.1.15.2 The techniques and instruments for assessing learning **must** be consistent with the educational objectives and the nature of the activities carried out.

4.1.15.3 It **must** be ensured that the instruments for assessing learning are developed on the basis of technical criteria that ensure their validity and reliability.

4.1.15.4 Relevant feedback on the results of the learning assessment **must** be provided in such a way that it contributes effectively to the training process of the person being assessed and to the improvement of the training activities used.

4.1.16 Incorporation of artificial intelligence: The appropriate incorporation of artificial intelligence tools into the training process must be ensured.

4.1.16.1 The level of integration of artificial intelligence tools in depth and breadth **must** be aligned with the training objectives, the achievement of attributes, and the commitment to sustainable development.

4.1.16.2 The development of technical skills for the use of artificial intelligence tools by students in the program **must** be ensured.

4.1.16.3 Student's ability to critically evaluate and use information generated by artificial intelligence **should** be encouraged.

4.1.16.4 The ethical, responsible, and safe use of Artificial Intelligence tools **should** be promoted.

4.1.16.5 It is advisable to have a regulatory framework with policies governing the use of Artificial Intelligence in education.

4.2. Academics: The evaluation of the academic staff of the degree program seeks to discern their suitability to contribute to the achievement of the educational objectives, the attributes of graduates, sustainable development, their effective participation in the substantive functions of academic practice, as well as the contextual conditions that favor their efforts in this regard.

A. General characteristics

The program **must** have the relevant conditions for the optimal development of its academic staff and the academic activities they carry out.

4.2.1 Hiring: The program **must** ensure a hiring scheme that prioritizes academic, professional, and personal merits and gender equality, as well as enable the best possible conditions for remuneration for their services.

4.2.1.1 The program **must** have schemes for attracting, selecting, and retaining academics that enable the hiring of the right people to carry out its educational project.

4.2.1.2 The program **must** provide an induction scheme for its academic staff that enables them to adapt satisfactorily to the organizational environment.

4.2.1.3 The program **must** have effective policies to promote gender equality in the hiring of its academic staff.

4.2.2 Academic organizational climate: The program **must** provide favorable conditions and an environment conducive to effective academic work.

4.2.2.1 The program **must** have effective and relevant policies and actions in place to facilitate proper academic practice.

4.2.2.2 It is advisable for the program to periodically conduct evaluations of the organizational climate, the results of which should serve as input for continuous improvement.

4.2.2.3 It is advisable for the main results of the organizational climate assessment to be disclosed to the academic community.

4.2.3 Number of academics: The program **must** have a sufficient number of academics to cover all areas of the program's development, enable adequate teacher-student interaction (), provide academic guidance to students, participate in the development, control, and administration of the academic curriculum, and cover all substantive areas of academic practice.

4.2.3.1 A significant percentage of the academic staff associated with subjects whose content is related to Engineering Sciences or Engineering Design **must** work on a full-time basis.

4.2.3.2 This percentage **must** be at least equivalent to having one academic for each general curricular area associated with content specific to Engineering Sciences and Engineering Design in the curriculum.

4.2.3.3 If full-time equivalents are considered for the calculations, an equitable allocation and proportion of the academic workload **must** be respected.

4.2.3.4 Priority **should** be given to hiring full-time academics in areas that the program considers relevant and has identified as having a greater need, but with special attention to hiring academics linked to subjects whose content is related to Engineering Sciences or Engineering Design.

4.2.3.5 It is advisable that a significant percentage of academic staff, duly justified, be hired on a part-time basis. Hiring less than a quarter of full-time staff is not considered advisable.

4.2.3.6 A significant percentage of academic staff involved in mathematics and natural sciences courses in the program **should** work full-time.

4.2.4 Academic and administrative career: The career **should** have an effective means of promotion and advancement in the academic and administrative status of its staff.

4.2.4.1 A scale of academic categories **must** be established and applied to enable academic and administrative staff to be promoted within the institution on the basis of proven academic and professional merit.

4.2.5 Academic council or equivalent: There must be an academic staff council or equivalent that facilitates the exchange of information, dialogue, and opinion on academic and administrative aspects of the program.

4.2.5.1 The academic council **should** meet periodically (at least once per academic year), with the participation of full-time (or tenured) academic staff and the program director. This meeting may be extended to other academic staff in the program, a representative of the student body, and administrative support staff.

4.2.5.2 The program's management authority **should** follow up on the agreements reached and verify their implementation.

4.2.5.3 It is advisable for the academic council or equivalent to have a clear and documented understanding of its authority and responsibility in the academic aspects of the program, regardless of the administrative structure within which it operates.

4.2.6 Curriculum and attributes committee: There **must** be at least one academic staff committee responsible for managing the program's curriculum and guiding the incorporation of the attributes approach into the educational process.

4.2.6.1 The committee's focus should be on the continuous updating of the curriculum, course syllabi, and the achievement of graduate attributes.

4.2.6.2 The majority of the committee members should be professionals who are members of CFIA or the corresponding professional association, licensed and qualified to practice professionally.

4.2.6.3 This committee **should** meet periodically and record the agreements reached.

4.2.7 Academic workload: The assignment of work to academic staff must be equitable and enable them to carry out their teaching and university duties, as well as participate in research, social outreach, innovation, and liaison with the productive and professional sectors.

4.2.7.1 The time allocated to academic staff for teaching, research, outreach, innovation, and outreach **must** be specified.

4.2.7.2 It is advisable that the number of students per course be appropriate to the nature and demands of the educational activity being carried out. It is necessary to ensure that the number of students per course is appropriate so that it does not hinder the effectiveness of the courses and the performance of the teaching staff.

4.2.7.3 A significant percentage of the workload of academic staff in the program related to teaching **should** be allocated to student support, academic guidance, and lesson preparations.

4.2.8 Research, outreach, innovation, and engagement: The program **must** ensure that, in addition to university teaching, the other substantive functions of higher education are fulfilled: research, outreach, innovation, and engagement.

4.2.8.1 At least the full-time academic staff teaching Engineering Sciences or Engineering Design courses must be participating or have participated in a research, social outreach, innovation, or outreach project in the three years prior to the visit.

4.2.8.2 The program **must** report the main results, effects, or impacts of these participations.

4.2.8.3 Academic staff must effectively incorporate the results of their own or others' research into their teaching work, as well as encourage their students' research skills and their participation in community outreach activities, innovation, or links with the productive and professional sectors.

4.2.9 Evaluation of teaching performance: The program **must** ensure that academic staff who perform as teachers in the various substantive functions of their practice are evaluated in an effective, relevant, and timely manner.

4.2.9.1 An academic staff performance evaluation tool **must** be developed and implemented to enable their improvement, promotion, and retention.

4.2.9.2 At least the program director and the students enrolled in the courses taught by the faculty member **should** participate in the faculty evaluation process.

4.2.9.3 The areas of evaluation, as well as their criteria, instruments, and performance indicators, **must** be known to the teaching staff and students.

4.2.9.4 It is recommended that performance evaluation be applied at least once during each academic period.

4.2.9.5 As part of the process of continuous improvement of teaching performance, it is advisable that it lead to the establishment of concrete improvement actions in the event that the evaluation results show unsatisfactory indices.

4.2.9.6 It is recommended that the program have effective strategies and actions that encourage good teaching performance.

4.2.10 Jos stability: The program **must** ensure that it has the means to retain the best academic staff for the effective performance of all substantive functions of the academic exercise.

4.2.10.1 There **should** be effective, relevant, and timely policies and actions that encourage the retention of academic staff who demonstrate a commitment to the continuous improvement of their performance.

4.2.10.2 If the Institution uses a model of permanent and temporary positions, the majority of academic staff **should** be employed in permanent positions. If any other hiring model is used, it **should** ensure the retention of the most qualified individuals.

4.2.11 Academic updating: The degree program must ensure that its teaching staff is up to date.

4.2.11.1 There **must** be a continuing education program that enables all academic staff to participate in formal training processes, either internal or external to the institution, in person or remotely, related to university teaching.

4.2.11.2 An up-to-date record **must** be kept of the participation and evaluation of all academic staff in the continuing education program over the last three years.

4.2.12 Commitment to continuous improvement in teaching: The program **must** ensure that its academic staff is committed to continuous improvement in their teaching practice.

4.2.12.1 Comparative tables of teaching performance **must** be available in the corresponding evaluations for at least the last three years.

4.2.12.2 If low performance rates are repeatedly observed, remedial plans **must** be established and implemented to effectively contribute to improvement in the deficient areas.

4.2.13 Commitment to the profession, training, and sustainable development: The program **must** ensure that its academic staff is committed to the profession, engineering education, and sustainable development goals.

4.2.13.1 The academic staff of the program **must** encourage students to recognize the role and importance of self-regulation of the profession and membership in CFIA, or corresponding professional association, as a manifestation of an ethical commitment to society, the profession, relationships with colleagues, and the provision of professional services.

4.2.13.2 Activities that demonstrate the academic staff's interest in supporting the improvement of the curriculum, as well as teaching and learning strategies and extracurricular activities related to the program that facilitate the achievement of graduate attributes, **should** be documented.

4.2.13.3 Actions by academic staff that encourage students to become aware of, commit to, and take effective action to achieve sustainable development goals, particularly those related to the professional activity that is the subject of the training process, **should** be documented.

B. Academic characteristics

The program **must** ensure that its academic staff possesses the highest possible qualities and academic development.

4.2.14 Academic training: The program **must** ensure that its academic staff has the highest possible level of academic training.

4.2.14.1 All academic staff in the program **must** have at least a bachelor's degree or equivalent.

4.2.14.2 A significant percentage, established and duly justified by the program, of the academic staff associated with subjects whose content is related to Engineering Sciences or Engineering Design must have a postgraduate degree (Master's or Doctorate), preferably in one of the program's professional fields.

4.2.14.3 Preference **should** be given to hiring full-time academic staff with postgraduate studies, preferably in one of the program's professional fields.

4.2.14.4 It is advisable for the program to encourage the specialization of its academic staff through certification in specialized areas of the profession and teaching practice.

4.2.15 Academic production: The academic staff of the program **must** demonstrate relevant and up-to-date academic production in engineering or engineering education.

4.2.15.1 An up-to-date record **should** be kept of the publication of books, articles in specialized journals endorsed by an editorial board, registered in recognized publication indexes, or with presentations at seminars or conferences.

4.2.15.2 It is desirable that academic production be linked to at least one of the following aspects: solving problems relevant to society, increasing the theoretical or practical knowledge of the discipline, sustainable development, improving

teaching practice, professional development, or the development of the productive sector.

4.2.16 University academic experience: The majority of academic staff associated with the program **should** have academic experience in higher education, preferably in accredited programs.

4.2.16.1 The degree program **must** keep an up-to-date record of the years of professional experience in university teaching of all its academic staff at the institutions where they worked.

4.2.16.2 It is desirable that the majority of academic staff have at least five years of academic experience.

C. Professional characteristics

The program **must** ensure that its academic staff possesses the highest possible qualities and professional development.

4.2.17 Professional incorporation and qualifications: All academic staff in the program, whether full-time or part-time, who teach subjects with content mainly related to Engineering Sciences or Engineering Design, **must** be licensed to practice professionally by CFIA or the corresponding professional association and be legally qualified to do so.

4.2.17.1 The program **must** keep an up-to-date record of the incorporation status of all academics' staff in its program.

4.2.17.2 The program **must** keep an up-to-date record of the professional practice status of the program's academic staff.

4.2.18 Participation in societies, professional associations, and technical committees: It is advisable for the program to effectively encourage the participation of its academic staff and academic in forums that promote the advancement, development, and evaluation of professional practice.

4.2.18.1 The program **must** keep an updated record of the time spent by all its academic staff participating in professional societies, associations, and technical committees.

4.2.18.2 The program **must** demonstrate the results (products, effects, or impacts) of this participation by academic staff in the educational process or in the program.

4.2.19 Professional development: The program **must** ensure that all its full-time or part-time academic staff involved in subjects with content related to Engineering Sciences and Engineering Design have opportunities for effective participation in development activities and interaction with the field of professional practice.

4.2.19.1 There **must** be a relevant and effective professional development program that enables academic staff to participate frequently in relevant continuing education activities in the professional field. Such as: courses, workshops, internships, forums, seminars, and conferences of professional societies.

4.2.19.2 The program **must** keep an updated record of the participation of all its academic staff in professional development activities, including the respective certifications.

4.2.19.3 It is advisable to encourage the participation of the academic staff of the program in the professional development (or professional certification) process of CFIA or the corresponding professional association.

4.2.19.4 It is advisable for the program to demonstrate the results (products, effects, or impacts) of academic staff participation in various professional development activities on the educational process or the program itself.

4.2.20 Professional experience: The program **must** ensure that its academic staff has or develops professional experience in their field.

4.2.20.1 Most of the academic staff associated with the program **should** have experience in the professional field of the discipline. This experience may include practicing the profession or completing internships or projects certified by the companies or organizations where they were carried out, or by projects registered with CFIA or the corresponding professional association.

4.2.20.2 Teaching, research, social action, innovation, or outreach activities may be considered professional experience, provides that they are clearly linked to topics and actions specific to the engineering profession.

4.3. Infrastructure: Buildings, equipment, and materials must enable the development of the substantive functions of the academy. They must facilitate the implementation of the curriculum, the learning process of the students, and the achievement of the results sought by the program, in particular the attributes of graduates and their contribution to sustainable development.

A. Buildings

The physical facilities in which the program is carried out must comply with applicable national legislation, have the relevant conditions that favor the fulfillment of its objectives, fully satisfy all the requirements of the curriculum, and favor the achievement of the attributes of graduates and the objectives of sustainable development.

4.3.1 Emergency and contingency response: The safety of individuals must be an imperative for the program and the institution, which **must** therefore be prepared to deal with emergencies and contingencies in all areas serving the program under evaluation.

4.3.1.1 Plans and protocols **must** be in place for responding to emergencies and any contingencies that may put the physical integrity of building users at risk.

4.3.1.2 Building users **must** be aware of these plans and protocols.

4.3.1.3 The effectiveness and relevance of the plans and protocols **must** be validated through drills, training, and incident reporting.

4.3.2 Classrooms and auditoriums: Classrooms and auditoriums **must** enable the effective delivery of education, with the relevant physical conditions, adequate safety, and sustainability.

4.3.2.1 The premises for lessons and lectures **must** be sufficient for the number of students and academic activities carried out.

4.3.2.2 They must meet the appropriate physical conditions of accessibility, space, and comfort in relation to the number and characteristics of the student body and the activities carried out.

4.3.2.3 They must have adequate environmental conditions in terms of lighting, ventilation, and noise insulation.

4.3.2.4 They must have adequate occupational health, safety, and environmental hygiene conditions.

4.3.2.5 They must have the appropriate furniture, in sufficient quantity and in good condition.

4.3.2.6 The academic and administrative authorities of the program must ensure that the people who use the classrooms and auditoriums are aware of the safety, occupational health, and environmental hygiene provisions and procedures established for the use of these buildings.

4.3.3.7 A maintenance program for classrooms and auditoriums **must** be in place and enforced.

4.3.3 Laboratories or workshops: Their number, configuration, and conditions **must** be adequate in relation to the subjects that require practical complementation of theoretical activity, taking into account relevant safety and sustainability aspects.

4.3.3.1 The program **must** have laboratories that are properly equipped for conducting experimental activities in natural sciences and engineering sciences, as well as for carrying out engineering design projects required by the program.

4.3.3.2 They must meet the relevant physical conditions of accessibility, space, and number of workstations.

4.3.3.3 They must have adequate lighting, ventilation, and noise insulation.

4.3.3.4 They must have adequate safety, occupational health, and environmental hygiene conditions: signage, fire extinguishers, smoke detectors, emergency exits, first aid equipment, eye wash stations, showers, fume hoods, and any other devices or equipment required for the activities carried out.

4.3.3.5 They must have the appropriate furniture, in sufficient quantity and in good condition.

4.3.3.6 The academic and administrative authorities of the program **must** ensure that people using the laboratories or workshops are familiar with the safety, occupational health, and environmental hygiene provisions and procedures established for their use.

4.3.3.7 A maintenance program for laboratories or workshops **must** exist and be implemented.

4.3.4 Computer labs: The program **must** have the necessary computer labs for the development of the applications required by the subjects in the curriculum in sufficient quantity, physical conditions of adequacy and safety, and relevant sustainability.

4.3.4.1 It must be ensured that the provisions for use and hours of operation allow for their timely and effective use by the students of the program.

4.3.4.2 They must meet the relevant physical conditions of accessibility, space, and number of workstations.

4.3.4.3 They must have adequate lighting, ventilation, and noise insulation.

4.3.4.4 They must have adequate safety, occupational health, and environmental hygiene conditions: signage, fire extinguishers, and emergency exits.

4.3.4.5 They must have the appropriate furniture, in sufficient quantity and in good condition.

4.3.4.6 The academic and administrative authorities of the program **must** ensure that people who use the computer labs are aware of the safety, occupational health, and environmental hygiene provisions and procedures established for their use.

4.3.4.7 A maintenance program for computer labs **must** exist and be implemented.

4.3.4.8 The program and its non-face-to-face activities must be supported by an efficient IT management and support unit that includes all the resources and

services to meet the requirements of virtual training (synchronous or asynchronous) in a stable, secure, and timely manner.

4.3.5 Facilities for sports, cultural activities, food, and bookstore: To ensure comprehensive training, recreation, comfort, and access to the necessary goods for the development of sports and cultural activities, the program **must** have the relevant facilities, as well as food and bookstore services. These facilities must meet the relevant physical, safety, and sustainability conditions.

4.3.5.1 The Institution must ensure Access to these resources, whether its own or those of third parties.

4.3.5.2 It **must** ensure that they meet the appropriate conditions to promote the well-being of teachers, students, and administrative staff.

4.3.5.3 The academic and administrative authorities of the program **must** ensure that the people who use the sports, cultural, food, and bookstore facilities are aware of the safety, occupational health, and environmental hygiene provisions and procedures established for their use.

4.3.5.4 A maintenance program for sports, cultural, food, and bookstore facilities **must** exist and be implemented.

4.3.6 Academic facilities: In order to promote academic Support for students, lesson preparation, and the development of administrative, research, outreach, innovation, or outreach activities, the program **must** provide academic staff with sufficient space, with the relevant equipment and physical conditions, and with the relevant safety and sustainability standards.

4.3.6.1 There **must** be properly equipped rooms assigned to academic staff, primarily full-time staff.

4.3.6.2 For part-time academic staff, at least one properly equipped space (academic room or similar) **must** be provided to enable interaction, the exchange of ideas, the coordination of activities, and, eventually, student support.

4.3.6.3 The academic and administrative authorities of the program **must** ensure that people using the spaces for academics are aware of the safety, occupational health, and environmental hygiene provisions and procedures established for their use.

4.3.6.4 A maintenance program for faculty facilities **must** exist and be implemented.

4.3.7 Library: The Institution **must** provide the program with at least one library facility that enables the achievement of the objectives of the courses in the curriculum, as well as the deepening of the content developed in the lessons and the development of documentary research. They **must** have the relevant physical conditions, adequacy, safety, and sustainability.

4.3.7.1 It must meet the relevant conditions of space, accessibility, workstations, and opening hours.

4.3.7.2 They must have adequate environmental conditions in terms of lighting, ventilation, and noise insulation.

4.3.7.3 They must have adequate conditions in terms of safety, occupational health and environmental hygiene, signage, emergency exits, and fire extinguishers.

4.3.7.4 It must have the relevant furniture, which must be sufficient and in good condition.

4.3.7.5 It must have functional spaces dedicated to individual study, group work, and conferences.

4.3.7.6 Access to library collections, remote documentation centers (virtual or online libraries), and the Internet **must** be made available for use by the program.

4.3.7.7 The academic and administrative authorities of the program **must** ensure that people who use the library are aware of the safety, occupational health, and environmental hygiene provisions and procedures established for its use.

4.3.7.8 A library maintenance program **must** be in place and implemented.

4.3.8 Facilities for administrative and support staff: The institution **must** provide offices for the administrative management of the program in sufficient quantity, physical condition, adequacy, and safety for sustainability.

4.3.8.1 It **must** need the conditions of space, accessibility, and workstations.

4.3.8.2 It **must** have adequate environmental conditions in terms of lighting, ventilation, and noise insulation.

4.3.8.3 It **must** have adequate safety, occupational health, and environmental hygiene conditions, signage, emergency exits, and fire extinguishers.

4.3.8.4 They **must** have the relevant furniture, in sufficient quantity and in good condition.

4.3.8.5 The academic and administrative authorities of the program must ensure that people using the facilities for administrative and support staff are aware of the safety, occupational health, and environmental hygiene provisions and procedures established for their use.

4.3.8.6 A maintenance program for administrative and support staff facilities must be in place and enforced.

B. Equipment

The program **must** have the equipment, devices, and instruments required to achieve its objectives, support the curriculum, facilitate teaching, administrative management, and contribute to safety and sustainability.

4.3.9 Audiovisual resources: The program **must** have audiovisual resources that allow for presentations and support teaching.

4.3.9.1 Adequate and sufficient means **must** be available for the execution of audiovisuals required by the established training activities.

4.3.9.2 These resources **must** be accessible in the premises where theoretical, laboratory, or workshop classes are held.

4.3.9.3 The academic and administrative authorities of the program **must** ensure that those who use the audiovisual resources are aware of the provisions and procedures related to safety, occupational health, and environmental hygiene established for their use.

4.3.9.4 A maintenance program for audiovisual resources **must** be in place and enforced.

4.3.10 Laboratory or workshop equipment: The program **must** have laboratory or workshop equipment that allows for practical activities to complement the theoretical activities of the curriculum in sufficient quantity and condition and that contributes to safety and sustainability.

4.3.10.1 It **must** be ensured that the laboratory, workshop, safety, and measuring instruments required for the subjects in the curriculum are available in sufficient quantity, variety, and good working order.

4.3.10.2 Suitable, sufficient, and well-maintained furniture **must** be available for storage and protection.

4.3.10.3 The academic and administrative authorities of the program **must** ensure that persons using laboratory or workshop equipment are familiar with the safety, occupational health, and environmental hygiene provisions and procedures established for its use.

4.3.10.4 A maintenance program for laboratory or workshop equipment **must** be in place and enforced.

4.3.11 Computer and communications equipment: Computer and communications laboratories for institutional use or for a particular program **must** facilitate the educational activities required by the curriculum and contribute to safety and sustainability.

4.3.11.1 They **must** have sufficient numbers of up-to-date computers with the necessary peripheral resources.

4.3.11.2 They **must** have the relevant resources and means of connectivity and Internet access.

4.3.11.3 All people who use computer equipment **must** be familiar with the provisions and procedures related to safety, occupational health, and environmental hygiene established for its use.

4.3.11.4 There **must** be a maintenance program for computer equipment used institutionally or for the particular degree program, and it must be implemented.

4.3.11.5 It is advisable for the program to have a virtual educational platform or online learning system (LMS) that enables the development of online teaching and learning processes.

4.3.12 Equipment for administration and support staff: To facilitate administrative management, the program must have office equipment in sufficient quantity and condition to contribute to safety and sustainability.

4.3.12.1 The amount of office equipment **must** be sufficient for the number of people who use it.

4.3.12.2 The equipment **must** be in good condition to ensure optimal performance.

4.3.12.3 The academic and administrative authorities of the program **must** ensure that the people who use the equipment for administrative and support staff are aware of the provisions and procedures related to safety, occupational health, and environmental hygiene established for its use.

4.3.12.4 A maintenance program for administrative and support staff equipment **must** be in place and enforced.

C. Materials

The program **must** have the reusable or consumable materials required to achieve its objectives and support the curriculum, laboratories, and workshops. In addition, these materials **must** facilitate both teaching and administrative management, ensuring their

availability in the appropriate quantity and condition, with a focus on promoting safety and sustainability.

4.3.13 Laboratory and workshop materials: It is the institution's **responsibility** to provide all the materials necessary for the laboratory and workshop practices derived from the subjects in the curriculum. These materials, whether reusable or consumable, **must** be available to ensure the proper execution of these practices.

4.3.13.1 The quantity of materials **must** be sufficient and delivered in a timely manner to ensure the completion of laboratory or workshop practices.

4.3.13.2 The state or condition of the materials **must** be suitable for their effective use in the training process.

4.3.13.3 Suitable, sufficient, and well-maintained furniture **must** be available for storage and protection.

4.3.13.4 The academic and administrative authorities of the program must ensure that those who use the laboratory or workshop materials are familiar with the provisions and procedures related to safety, occupational health, and environmental hygiene established for their use.

4.3.14 Computer programs: The program must provide up-to-date application programs (general and specialized), as well as the virtual educational platforms required by the subjects in the curriculum, ensuring respect for their intellectual property rights.

4.3.14.1 The quantity, variety, and accessibility of application programs (general and specialized) and virtual educational platforms **must** adequately respond to the requirements of the curriculum and the characteristics of the different user profiles.

4.3.14.2 Application programs **must** have the respective licenses or, failing that, use freely accessible programs.

4.3.15 Books, manuals, and specialized periodicals: The library collection **must** include textbooks and reference books, as well as the technical manuals (manufacturer's

specification sheets, technical codes, technical standards and norms) necessary for the subjects in the curriculum. These resources may be available in physical or digital format.

4.3.15.1 The quantity, variety, and accessibility of books, manuals, and periodicals **must** be sufficient to meet the demand of different user profiles.

4.3.15.2 Books, manuals, and periodicals **must** be up to date, ensuring their relevance to the objectives, study content, and attributes to be developed.

4.3.15.3 The program **must** have a subscription to specialized periodicals that cover the topics required by the development axes or subject areas of the curriculum.

4.3.16 Laboratory or workshop practice manuals: Depending on the specific characteristics of each curriculum, laboratory or workshop practice manuals **must** be available.

4.3.16.1 These manuals **must** be accessible to students, either in physical or digital format, and in accordance with the profile of the users.

4.3.16.2 Adequate coordination between the theoretical content and the proposed practical experiences **must** be ensured.

4.3.16.3 In addition to the activities to be carried out, the manuals **must** include safety, occupational health, environmental hygiene, equipment care, and procedures for carrying out the corresponding practices.

4.3.17 Reference materials: As resources for learning and teaching support, the program **must** have graphic or audiovisual materials.

4.3.17.1 The quantity, variety, and condition of these materials **must** be adequate to support the established training activities.

4.3.17.2 It is advisable for the Institution to have information and communication resources applied to the training process, such as virtual aids for the content being studied, web pages for the program's subjects, and social media channels that allow interaction between academic staff and students, among others.

4.4. Program administration: The evaluation of administrative management focuses on determining whether it facilitates the necessary conditions for students to develop the attributes they **should** possess upon graduation from the program and contribute to sustainable development in an environment that promotes continuous improvement.

A. Administrative structure

The program **must** have administrative management focused on continuous improvement as part of the quality assurance process.

4.4.1 Program planning: Program planning **must** be effective and efficient to ensure the fulfillment of the program's purposes, the achievement of the attributes of the student body upon graduation, alignment with sustainable development goals, and the encouragement of continuous improvement.

4.4.1.1 The existence of a plan or guidelines for strategic, operational, and support actions for the program **must** be verified, using the relevant management tools, instruments, and adequately coordinated with institutional planning.

4.4.1.2 The program **must** have a periodic, updated, and implemented operational plan that specifies objectives, goals, indicators, timelines, and responsible parties.

4.4.1.3 A general implementation and Budget projection plan **must** be presented that demonstrates the timely allocation of resources to the strategic, operational, and support processes of the program.

4.4.1.4 The role of the council, academic body, or equivalent must be clear and effective in making strategic decisions related to the program. To this end, their participation in the analysis and design of the strategic orientation or plan **must** be ensured.

4.4.2 Organization: The organization of the program's administrative bodies must ensure comprehensive, diligent, and efficient management of the services offered to students, academic staff, and the general public.

4.4.2.1 An organizational chart **must** be provided that clearly represents the administrative structure of the degree program, indicating the different levels that comprise it.

4.4.2.2. The program **must** provide evidence that its administrative structure is relevant to the comprehensive, diligent, and efficient management of the service offered to students, academic staff, and the general public.

4.4.3 Constitution and performance: The administrative management **must** have the right people in place, who occupy the different levels of the organizational structure and perform the required functions appropriately.

4.4.3.1 The number, tenure, dedication, and qualifications of the people in charge of administrative management **must** be relevant to meeting the demands of the program.

4.4.3.2 The program **must** have the necessary full-time administrative support staff to ensure efficient management.

4.4.3.3 The program must have personnel responsible for the established laboratories or workshops, with the necessary skills for the functions required by their positions.

4.4.3.4 A general assessment of the attitude and commitment of administrative support staff, as well as those in charge of the program's laboratories and workshops, **should** be carried out periodically through organizational climate evaluations.

4.4.3.5 A periodic performance evaluation of the personnel in charge of administrative management **should** be carried out as a tool to promote continuous improvement and professional development of the personnel.

4.4.3.6 The career **must** have effective policies and actions in place to promote gender equality in the hiring of its administrative and technical staff.

4.4.4 Program management: The program **must** have adequate staff with the relevant leadership skills for program management, planning, implementation, control, and evaluation of the corresponding administrative and academic functions.

4.4.4.1 It **must** have, at a minimum, a management authority incorporated into CFIA or the corresponding professional association, which is qualified to practice professionally.

4.4.4.2 The management authority **must** have, at a minimum, a bachelor's degree and at least five years of academic or professional experience.

4.4.4.3 The program director **must** be employed at least three-quarters of full time to handle the administrative management of the program.

4.4.4.4 The program director must demonstrate leadership characterized by a commitment to quality, strategic vision, effective communication, empathy, good interpersonal skills, and decision-making ability.

4.4.4.5 The program director must effectively ensure the adequate and sustainable allocation of the resources necessary for the development of the program.

B. Administrative policies

The program **must** have administrative policies that favor the provision of the services necessary for the development of the program and the achievement of its goals, including the attainment of the attributes of graduates and alignment with sustainable development objectives.

4.4.5 Commitment to continuous improvement in administrative management: Planning, implementation, monitoring, and decision-making for continuous improvement **should** be fundamental components of program administration.

4.4.5.1 The career **must** identify and document, at a minimum, strategic, tactical, support, and measurement processes.

4.4.5.2 Management indicators **must** be in place for all identified processes: strategic, tactical (key), and support (complimentary or auxiliary).

4.4.5.3 The level of compliance with the established indicators **must** be verified.

4.4.5.4 Appropriate corrective actions **must** be established and implanted in the event of non-compliance with the established indices.

4.4.5.5 It is advisable for the program to have an internal quality management system (SIGC) that allows for critical evaluation of the quality of all its services and activities, contributing to their continuous improvement.

4.4.6 Financial resources: The program **must** have sufficient and timely financial resources to meet the needs of the curriculum, the teaching faculty, the infrastructure, student services, and administrative management.

4.4.6.1 The program **must** have a budget that clearly specifies the different categories and the financial resources allocated to each of them.

4.4.6.2 Financial resources must be sufficient to ensure that qualified academic and support staff can be recruited, retained, and provided with effective opportunities for continuous professional development.

4.4.6.3 Financial resources must be sufficient to ensure that infrastructure, equipment, and materials can be acquired when needed, properly maintained, and renewed in a timely manner.

4.4.7 Information and registration system: Administrative management **must** ensure that relevant information about the program is available in a clear, accurate, and timely manner to students, faculty, and the general public.

4.4.7.1 There **must** be a complete, secure, reliable, and up-to-date database of all students in the program, which serves as input for decision-making and records their main academic and sociodemographic characteristics.

4.4.7.2 The information system **must** enable the extraction of different academic indices associated with the student body and the program's courses, such as enrollment, course passes and fails, dropouts, retention, recognition of internal and external studies, weighted averages, and graduation.

4.4.7.3 There **should** be a database of teaching and administrative staff, containing relevant information on each person.

4.4.7.4 The administration **must** ensure that students have Access to reliable certifications and records of their studies and grades.

4.4.8 Links with the professional and business sectors: The administrative management of the program must encourage and carry out actions that promote appropriate links between the program, academic staff, and students with the professional and business sectors.

4.4.8.1 Outreach activities such as colloquiums, internships, professional placements, joint project development, cooperation agreements, and service provision **should** be carried out.

4.4.8.2 Special emphasis **should** be placed on the participation of academic staff and students in CFIA or corresponding professional association, as well as its committees and affiliated associations.

4.4.8.3 Specific policies **should** be established to encourage understanding of incorporation and licensing as indicators of social responsibility, professional dignity, respect in relationships with colleagues, and excellence in the provision of services associated with professional activity.

4.4.9 Outreach to the community: A significant proportion of the program's efforts **should** be devoted to actions that benefit the community.

4.4.9.1 The program must provide evidence of the relevance of the activities carried out, as well as the results obtained in terms of products, effects, and impacts.

4.4.9.2 It is advisable to carry out activities that actively involve students, teaching and administrative staff with the community, addressing its problems and needs.

4.4.10 Promotion of and participation in research, technological development, and innovation: The program **should** promote and encourage participation in research, technological development, and innovation projects and programs.

4.4.10.1 The degree program **must** have policies that promote and encourage the participation of academic staff and students in research, technological development, and innovation programs and projects established in the corresponding institutional or degree program plan.

4.4.10.2 The program **must** have policies that promote and encourage the incorporation of research, technological development, and innovation results into the educational process.

4.4.10.3 It is recommended that academic relationships be maintained, and joint activities be carried out with centers, groups, networks, or programs dedicated to scientific research, education, outreach, innovation, and engagement.

4.4.10.4 It is advisable for the program to have means for disseminating academic output, including research results, outreach, innovation, and final graduation projects, as appropriate.

4.4.11 Occupational health, safety, environmental hygiene, and sustainability: The program must have occupational health, safety, environmental hygiene, and sustainability policies that reflect concrete actions aimed at consolidating an “organizational culture” around these aspects.

4.4.11.1 A program for awareness, training, prevention, and mitigation of occupational health, safety, and environmental hygiene risks **must** be established and implemented.

4.4.11.2 The program **must** guarantee adequate conditions that promote the physical, mental, and emotional well-being of the entire academic community.

4.4.11.3 The degree program **must** have effective guidelines, strategies, and actions that enable progress in its commitment to sustainable development.

4.4.12 Administrative organizational climate: The work environment **must** be conducive to the training process and proper administrative performance.

4.4.12.1 The program **must** conduct and report a general qualitative assessment of the quality, attitude, and commitment of its administrative support staff and laboratory or workshop managers. This assessment may be based, for example, on the main findings of an organizational climate survey.

4.4.12.2 The results of this assessment **should** lead to relevant and timely actions to address potential weaknesses, minimize threats, maintain and improve strengths, and take advantage of opportunities.

4.4.13 Internationalization of the program: It is recommended that the program have effective guidelines and actions for its internationalization, enabling cooperation, integration, and academic mobility of students and teaching staff. This should facilitate the exchange of knowledge, experience with other cultures, and preparation of graduates and academic staff to perform effectively in an international and multicultural environment.

4.4.13.1 The program seeks to ensure that its curriculum has a global focus, including learning objectives and activities related to topics of global interest linked to the area of training and sustainable development.

4.4.13.2 The program encourages student and academic staff exchange programs through agreements with foreign universities and research institutes.

4.4.13.3 Opportunities are sought for students to undertake internships and work placements in companies or organizations abroad.

4.4.13.4 Participation in visits to international institutions and events by students, faculty, and administrative staff is encouraged.

4.4.13.5 Participation in International education and collaboration networks is promoted.

4.4.13.6 Joint research and development projects are carried out with international entities.

4.4.13.7 Programs and events are developed to promote cultural diversity.

C. Rules and regulations

The degree program **must** have rules and regulations governing the duties and rights of the academic community and ensure strict compliance with them.

4.4.14 Regulations: The degree program **must** have relevant regulations governing the rights and duties of the academic community.

4.4.14.1 Academic and administrative staff: There **must** be regulations governing the selection, admission, tenure, safety, evaluation, training, development, incentives, duties, and rights of academic, administrative, and support staff.

4.4.14.2 Teaching, learning, and evaluation processes: There must be regulations governing teaching and learning processes and establishing general policies for learning evaluation. Student assessment **must** adequately combine diagnostic, formative, and summative assessment, ensuring consistency with the expected progression of students and the expected learning outcomes, especially the attributes of graduates.

4.4.14.3 Final projects: There must be adequate regulations governing the graduation process, its development, the presentation and public defense of the results, and their evaluation.

4.4.14.4 Regarding students: There must be regulations governing admission, retention, progress in training, graduation, safety, duties, and rights of students.

4.4.14.5 Control of the curriculum: There must be relevant regulations governing modifications and control of the curriculum. The participation of the director and academic staff of the program in curricular modifications **must** be made explicit by recording it in the minutes.

4.4.15 Recognition of prior learning: It **must** be ensured that individuals who enter the program through recognition of prior learning fully comply, at the time of graduation, with the objectives and content established in the curriculum and the attributes of graduates.

4.4.15.1 There **must** be relevant regulations for the process of recognizing studies completed in other programs, both within and outside the institution. This includes advanced studies, previous studies, transfer credits, exchange studies, or validation of studies.

4.4.15.2 The recognition of prior studies cannot exceed 50% of the subjects in the curriculum, an equal proportion if the calculation is made with academic credits or accreditation units. In any case, at least 50% residency in the program **must** be ensured.

4.4.15.3 If subjects from an accredited program are considered for recognition, they cannot exceed 50%; if they correspond to a non-accredited program, they cannot exceed 20%.

4.4.15.4 The recognition of previous studies related to aspects of engineering sciences and engineering design can only be carried out if they were taken in a university-level program, duly accredited by the AAPIA Accreditation Council or

by an accreditation agency recognized by it, in particular under the Washington or Lima agreements.

4.4.15.5 If prior postsecondary studies in areas such as mathematics, natural sciences, or complementary engineering studies are recognized, the criteria and procedures **must** be clearly stated in the institution's admission policies.

4.5. Students and graduates: This evaluation category covers aspects and characteristics of the program related to admission, conditions that promote student well-being, and evidence of the impact of these elements on the achievement of student attributes, their contribution to sustainable development, and links with program graduates.

A. Student body

The degree program **must** provide conditions that promote the creation, development, and consolidation of the program's objectives, as well as the attributes and contribution to sustainable development goals that students should demonstrate upon completion of their education.

4.5.1 Student environment: The program **must** seek to create an environment that promotes the comprehensive education of students, contributes to the achievement of the objectives of the educational process, and fosters attributes and a commitment to sustainable development.

4.5.1.1 The program **must** list the actions that promote the comprehensive development of students.

4.5.1.2 The program **must** carry out and report on a general qualitative assessment of the attitude and commitment of its students toward the program, supported by concrete examples.

4.5.2 Admission: The program **must** endeavor, to the extent possible, to provide access to education to all interested persons under equitable conditions and ensure compliance with the established admission profile.

4.5.2.1 As a tool for social mobility and personal development, the degree program **must** include equitable access policies and processes, without distinctions of any kind.

4.5.2.2 Criteria and procedures **must** be in place to verify that individuals interested in pursuing the training provided by the degree program meet the established admission profile.

4.5.2.3 Relevant information about the academic and professional profile, current curriculum, admission requirements and conditions, and the resources necessary to begin the teaching and learning processes of the degree program **must** be provided in a public and accessible manner.

4.5.3 Promotion and graduation process and policies: The degree program **must** have criteria and procedures in place to regulate progress and successful completion of the educational process.

4.5.3.1 The processes and policies for student promotion and graduation **must** be documented in a clear and accessible manner.

4.5.3.2 An up-to-date record **must** be kept with follow-up information.

4.5.3.3 The Institution **must** demonstrate that all students have met the requirement for graduation in the program identified in their academic record and that the educational plan followed is consistent with the program being accredited.

4.5.4 Academic advising and guidance: The degree program **must** ensure academic advising and guidance for its students and for those who aspire to enter the educational process.

4.5.4.1 The program **must** provide students with the necessary advice and guidance to consolidate their career choice, validate their continued enrollment, and achieve success in the educational process.

4.5.4.2 The program **must** provide the necessary advice and guidance to guide candidates entering the educational process.

4.5.5 Performance improvement strategies: The program **must** strive for the best performance of its students in achieving the objectives, study content, attributes, and commitment to sustainable development goals.

4.5.5.1 As part of the strategic actions of the program administration and faculty, the academic progress of students **must** be monitored.

4.5.5.2 Specific corrective actions **should** be established and implemented in the event of low academic performance rates.

4.5.6 Student welfare office: The program **must** seek to ensure the well-being of its students.

4.5.6.1 The program administration **should** establish guidelines aimed at student well-being.

4.5.6.2 The necessary mechanisms **must** be created to promptly and efficiently address student concerns, channel their initiatives, offer them relevant and timely guidance on administrative processes and their rights and duties, and administer available scholarships and financial aid fairly.

4.5.7 Student association: As part of the educational commitment of the degree program, the creation, continuity, and development of student associations **should be** effectively encouraged.

4.5.7.1 Student participation in the development and improvement of the degree program and educational program **should** be encouraged.

4.5.7.2 The creation, permanence, and development of student associations or groups that enable the development of leadership, organization, teamwork, solidarity, artistic expression, sports, community outreach, and well-being **should** be effectively encouraged.

4.5.8 Degree audit: The degree program must demonstrate that all its policies, procedures, and regulations related to students are applied and complied with by all persons who are admitted, remain, and complete the educational process.

4.5.8.1 The effectiveness of the monitoring, control, and enforcement actions carried out by the program authorities **must** be demonstrated.

4.5.8.2 It **must** be ensured that all policies, procedures, and regulations are applied and complied with by all persons admitted, who remain in and complete the program's educational process.

B. Regarding program graduates.

The program **must** seek relevant feedback from its graduates in order to evaluate its impact on the economic, social, and environmental spheres.

4.5.9 Graduate follow-up: The program **must** implement effective follow-up of its graduates, enabling it to obtain their opinions on the training program in particular and the program in general, as well as providing access to any continuing education opportunities that may be offered.

4.5.9.1 Efforts **should** be made to collect timely information from graduates through a comprehensive, secure, reliable, and up-to-date database.

4.5.9.2 The Institution **must** conduct periodic studies on the relevance, validity, timeliness, and perception of the program and the educational program by graduates.

4.5.9.3 The frequency of these studies **should** not exceed the average time required for students to complete the program.

4.5.9.4 Evidence **must** be provided that the results of these graduate follow-up studies are used as input for the continuous improvement of the degree program and training program.

4.5.9.5 It is advisable to offer graduates relevant opportunities for continuing education.

5. Accreditation procedure.

5.1 Application: The accreditation process for a program is only applied at the request of a particular institution and with the consent of the relevant authority.

5.2 Calls for applications: The CFIA Accreditation Council will issue two regular calls for applications for the accreditation of engineering programs each year. The CFIA Accreditation Council may issue extraordinary calls for applications if it deems it necessary.

5.3 Stages of external evaluation: The external evaluation process consists of two parts: first, there is the evaluation of the program by a visiting team and the accreditation decision by the CFIA Accreditation Council. The program evaluation is based on the detailed data provided by the institution in the self-evaluation document and on the consensus opinion of the visiting team members. Second, there is the accreditation decision, which is made by the CFIA Accreditation Council () and is based on qualitative and quantitative considerations.

5.4 Self-evaluation: The program must conduct an evaluation of its own program prior to its application.

The purpose of this is to determine whether the program meets the minimum requirements necessary to participate in an accreditation process or, if not, to determine the areas or aspects that **need** to be strengthened before undergoing the process.

5.5 Self-evaluation document: The self-evaluation document collects general information about the institution that hosts the program and the academic unit being evaluated. It also includes a detailed analysis of the accreditation criteria, indicating strengths and weaknesses.

Only the format for the self-assessment document established the CFIA Accreditation Council should be used. Any other additional information considered relevant should be available on the first day of the visit, in the premises provided for the evaluation team.

5.6 Application for accreditation and submission of the self-evaluation document: The rector or highest authority of the institution interested in evaluating an engineering program must send a request addressed to the president of the CFIA Accreditation Council. This request must indicate the intention to initiate the accreditation process and declare knowledge of all the conditions established in the instructions and procedures.

The letter must include at least the following information:

- **Name of the academic program (s).**
- **Name of the persons responsible for the program: Dean of the Faculty, Director of the School, or their equivalents.**
- **Relevant postal address, telephone number, and email address.**
- **A clause stating that the commitments made are known and accepted, and that the fees for the agency's accreditation services have already been paid by the means provided.**

If the application is made in hard copy (printed documents), the institution must provide the self-evaluation document for the program under evaluation in a format that allows electronic access to the information.

If the documentation is not received as required (complete, clear, truthful, objective, and relevant), the CFIA Accreditation Council may not authorize the visit.

5.7 Acceptance to begin the accreditation process: The CFIA Accreditation Council will notify the applicant university in writing of its acceptance to begin the accreditation process. Attached to this notification will be a schedule with dates, activities, names of the members of the visiting team, and the costs of the accreditation process.

5.8 Selection of the evaluation team and analysis of documents: The CFIA Accreditation Council will proceed with the selection and appointment of the evaluation team that will be responsible for analyzing the documentation submitted by the program and conducting the on-site visit.

The evaluation team will be composed of at least three engineering professionals who are members of the CFIA when evaluating a single program. These will be: a head, a deputy head, and a specialist. For each additional program at the same university, one specialist will be added. At least one of the specialists must belong to the profession being evaluated. In the event of a shortage, a specialist from a related profession will be appointed.

The person in charge of leading the visiting team will usually, but not exclusively, be a member of the CFIA Accreditation Council or the technical accreditation committees.

At least one member of the evaluation team may be a foreigner qualified in accreditation processes. Observers may also participate, but they must be endorsed by the CFIA Accreditation Council and the authorities of the program to be visited.

The CFIA Accreditation Council will inform the University of the names of the professionals who will make up the program evaluation team in advance of the visit.

If the program authorities have any objection to the appointment of any of the members of the visiting team, they must submit a note to the CFIA Accreditation Council, indicating the reasons for their objection. It will be at the discretion of the CFIA Accreditation Council whether or not to accept the reasons given.

Prior to the program visit, the evaluation team must analyze the program's self-evaluation document. All members of the visiting team must make an initial assessment of the assessment of the accreditation criteria, based on the documentary information provided. The purpose of this preliminary assessment is to obtain an overall understanding of compliance with the accreditation criteria and to identify any potential “weak links” in the program, which will be the focus of the evaluation during the visit. If there is an improvement project resulting from previous evaluation visits or corresponding annual reports, these should be included in the documentation to be analyzed.

5.9 Program visit: The accreditation visit provides an opportunity for the visiting team to verify the information in the self-evaluation document and to assess qualitative factors such as: the intellectual atmosphere and mood (organizational climate), professional attitudes, and the quality of staff and students.

Before the start of the evaluation visit, the CFIA Accreditation Council will send the person responsible for the program the corresponding agenda format, which must be defined at the start of the visit, by mutual agreement between the program authorities and the person leading the evaluation team. A copy of the final agenda must be attached to the evaluation report.

The accreditation visit will usually take place over three days. However, if the program has particular characteristics, such as being offered (in whole or in part) at different locations or campuses, the visit may be extended by one or two days at most in order to gather the relevant information.

On the first day of the visit, the evaluation team will conduct a detailed analysis and verify the data contained in the documentation submitted. In addition, a review will be carried out of information relating to the student body and teaching staff, such as:

- Recent evaluations and academic work (academic period prior to the visit).
- Laboratory standards and procedures manuals.
- Student grade certificates.
- Reports on students' laboratory or workshop practices in different courses.
- Bachelor's degree graduation projects: Project documents and degree thesis.
- Research projects carried out by students.
- Student academic records (anonymous if necessary).
- Teaching and subject portfolios (physical or electronic), or their equivalents.
- Strategic plans or guidelines, survey results, graphic evidence of actions taken, samples of regulations, and results of the evaluation of graduate attributes.

This information must be available, organized, and classified in the office or area designated for the visiting team.

On the second and third days, interviews will be conducted with students, teaching staff, school and center principals, university authorities, and support staff, and the program and university facilities (infrastructure, equipment, and materials) will be evaluated. At a minimum, the following activities will be carried out:

- Interview with the rector or highest authority of the institution.
- Interviews with the Dean or equivalent of the Faculty and the Faculty Council.
- Interview with the director of the school, department or academic unit or its equivalent.
- Interview with the committee in charge of coordinating the program's self-evaluation.
- Interview with the teaching staff of the school or department individually and in groups in order to evaluate professional attitudes, work ethics, as well as general opinions on the theoretical and practical elements of the study plan.
- Interview with students and members of the program's student association, both individually and in groups.
- Interview with the administrative and technical support staff for the program.
- Interview with the directors or equivalent of the schools or departments that teach complementary training courses, mathematics and basic sciences for the program.
- Interview with the Vice-Rectors of Student Welfare and Financial Administration or their equivalents.
- Tour of the program's facilities (laboratories, workshops, specialized classrooms, computer centers).
- Tour of the university facilities and interview with the people in charge of the different centers (library, resource centers, computer centers, student cafeteria, sports and cultural facilities).

The university must appoint a person responsible for handling the logistics of the visit, whose name must be communicated to the head of the evaluation team before the visit begins. This person must have the capacity to carry out their duties and may not be part of the group of people to be interviewed. In addition, they must be available throughout the event to attend to the requirements of the evaluation team.

The costs of transportation and meals for the evaluation team during the days of the visit will be covered by the university.

The university shall provide the evaluation team with an office or space within its facilities, which shall be at its disposal for the purpose of conducting the necessary study and analysis sessions. This space must meet the conditions of privacy, comfort, and access to adequate office resources.

On the last day of the visit, a general meeting will be held with program authorities, where the evaluation team will present a preliminary oral report on the main findings of the visit: strengths, weaknesses, and areas of concern. This meeting may be attended by individuals deemed appropriate by program authorities.

This report is preliminary and does not reflect the final position of the CFIA Accreditation Council on whether or not to accredit the program.

5.10 Evaluation team report: Two weeks after the visit, the person in charge of the evaluation team will send a report to the CFIA Accreditation Council, summarizing the visit and highlighting the program's strengths, weaknesses, and areas of concern, in accordance with the established criteria. This report should not include recommendations regarding the accreditation or non-accreditation of the program, which is the sole decision of the CFIA Accreditation Council.

The CFIA Accreditation Council will then send this report to the person responsible for the program to ensure that the information is accurate and complete.

Two weeks later, the program authorities will be able to respond to the evaluation team's findings, indicating how all the weaknesses identified in the preliminary report

will be addressed. They must submit an improvement plan that includes, at a minimum, the actions to be taken, the implementation schedule, the goals set, the anticipated budget allocation, and the individuals responsible for implementation. This document will be considered a commitment on the part of the program and, therefore, must be endorsed by senior authorities.

5.11 Accreditation decision: To make the accreditation decision, a meeting of the CFIA Accreditation Council will be held, in which the national members of the evaluation team may participate, as well as the dean or equivalent of the faculty or the director of the program under evaluation, if so designated by the CFIA Accreditation Council.

The following documents will be considered when making the accreditation decision:

- The information provided by the program.
- The evaluation team's report.
- The program's response to the evaluation team's report.
- The improvement project.

Two weeks prior to the decision session, the CFIA Accreditation Council will appoint an ad hoc information analysis team from among its members, which will be responsible for preparing, if necessary, the questions to be asked during the session to the persons responsible for the program or visiting team, or a succinct report on the program's compliance with the accreditation criteria, with a recommendation on whether or not to accredit the program, as well as the term of accreditation. If this team deems it appropriate, it may also outline possible improvement actions as a respectful recommendation to the program. It is at the discretion of the CFIA Accreditation Council whether or not to forward these recommendations to the program.

The members of the CFIA Accreditation Council or Technical Accreditation Committees who served as head of the evaluation team shall present their observations on the visit to the other members of the CFIA Accreditation Council, referring to compliance or non-

compliance with the established criteria and helping to clarify the aspects and conclusions identified by the analysis team.

If the authorities of the evaluated program are present, they may refer to the evaluation report, as well as to the questions posed by the members of the CFIA Accreditation Council.

At the end of the hearing, university representatives, as well as any member of the CFIA Accreditation Council who recognizes conflicts of interest, will leave the room so that the remaining individuals can deliberate on the accreditation status of the program under evaluation. Their decision will be submitted to the CFIA Board of Directors for its information.

The term of accreditation for a program is at the discretion of the CFIA Accreditation Council and may be granted for a maximum period of six years.

The accreditation decision, its terms, conditions, and the observations and recommendations of the CFIA Accreditation Council will be notified in writing to the authorities of the university offering the evaluated program.

5.12 Appeal for review: In the event of a decision by the CFIA Accreditation Council to terminate or deny accreditation of a program, the authorities of the program involved may request a formal review of the decision within two weeks of receiving notification of the CFIA Accreditation Council's decision.

This appeal may also be filed if the authorities of the evaluated program disagree with the accreditation period granted. Likewise, the deadline for this appeal is no later than two weeks after receiving notification of the CFIA Accreditation Council's decision.

The request for a formal review must succinctly and accurately identify the points in the accreditation decision that the institution requires to be clarified or revised and the reasons it gives for doing so.

For the analysis and corresponding recommendation of the request for review, the CFIA Accreditation Council shall appoint an ad hoc committee of three members from among its members, which shall submit its report within a period not exceeding 15 calendar days.

Once the ad hoc committee's report is known, the CFIA Accreditation Council will make a decision that will be communicated to the authorities of the evaluated program within a period of no more than four weeks. Appeals may be lodged against the CFIA Accreditation Council's accreditation decisions in accordance with the law.

The entire accreditation process and all reports are confidential. However, the CFIA Accreditation Council's annual report will list all programs accredited during that period and those whose accreditation is currently valid. Programs that were not accredited will not be mentioned.

The program must inform the CFIA Accreditation Council of all changes made to the program during the period in which the accreditation is valid.

Any change related to an aspect covered by the accreditation criteria, procedures, and related regulations is considered a significant change, thereby giving rise to the obligation to submit a report and may require immediate reassessment, if so determined by the CFIA Accreditation Council.

Any change in the title (or name) of an accredited program requires approval by the CFIA Accreditation Council in order to maintain accredited status.

When an institution submits information for accreditation renewal or extension, it is required to highlight and notify the CFIA Accreditation Council of any changes to the program.

Likewise, the CFIA Accreditation Council reserves the right to modify the accreditation status of any program at any institution if it is discovered that said program does not comply with any established accreditation criteria.

5.13 Follow-up on improvement projects: The CFIA Accreditation Council will follow up on the improvement project presented, for which the program must submit a biannual implementation report. The submission of this report is essential to maintain the program's accreditation status.

If a serious breach of the improvement commitments is evidenced, the accredited program authorities will be notified of the situation, and the program management will be summoned to a hearing with the CFIA Accreditation Council to address the allegations made and their possible mitigation.

It shall be the prerogative of the CFIA Accreditation Council to accept or reject the reasons and mitigation proposals presented, as well as to maintain or shorten the accreditation period granted.

5.14. Terminal plans: In the case of terminal plans with valid accreditation, the CFIA Accreditation Council will define the term of validity of the accreditation, taking into account the program completion date, so as not to disadvantage individuals who have not yet completed their training in that program.

6. GLOSSARY OF TERMS AND CONCEPTS.

Social action: Substantive academic function that seeks to forge alliances between academia and civil society, with the aim of contributing to the common good, social transformation, and improved quality of life through concrete actions and projects.

Accreditation: Accreditation is a periodic evaluation process of an educational program, which ultimately allows for a judgment to be made on the value and merit of its quality, ensuring that it meets the minimum conditions necessary to provide relevant academic training in a professional discipline.

Accessibility: The quality of being accessible. Ease of normal use of a good or service by any user, regardless of their technical, cognitive, or physical abilities.

Attitude: A qualitative construct that seeks to determine the motivation of the people involved and reveals their state of mind. It is an underlying disposition that contributes to a variety of behaviors, favorable or otherwise, in relation to the achievement of program objectives.

Update: Remains at the state of the art in its specific field.

Suitable: That is convenient, appropriate, and fitting for something.

Administration: Set of actions involving the planning, organization, management, coordination, and control of an academic unit or degree program.

Program administration: This category evaluates the institution's organization, management, and internal policies that ensure the academic and administrative functioning of the study program. It includes management processes, decision-making, and support for the academic community.

Organizational environment or climate: Set of characteristics of people and the environment, their relationships, interactions, and perceptions that determine work motivation, influence productivity, and the development of human talent in the career.

Online learning: This is an educational process that takes place via digital platforms, where students and teachers interact in virtual environments to access content, develop skills, and assess knowledge. This learning can be synchronous, when it occurs in real time through videoconferencing, chats, or other interactive tools; or asynchronous, when it is carried out flexibly, allowing students to access material, participate in forums, or perform activities at their own pace.

Appropriation: Referring to maturity in commitment, this represents the second level. It establishes indicators that show that the person has begun to actively integrate the aspect into their personal, professional, community, or work life.

Disciplinary areas: Also known as “professional areas,” these are fields of professional activity included in the academic curriculum that are distinguished by their content, procedures, and tools, and which may indicate an area of specialization in professional practice.

Attributes of graduates: Set of assessable individual outcomes that are indicative of the graduate's potential to acquire the competence for professional practice. They identify the skills that characterize the performance of graduates, which are achieved during the training process as a result of it.

As human capabilities, the formation of attributes occurs gradually, advancing from an initial level, through an intermediate level, to an advanced level. This progression reflects maturity in the acquisition of the capabilities (knowledge, skills, and attitudes) necessary for the start of professional practice.

For the purposes of accreditation by the AAPIA, the program must incorporate and develop at least the following attributes in the training process:

- **Engineering knowledge:** Ability to apply university-level knowledge of mathematics, natural sciences, engineering fundamentals, and specialized engineering knowledge to solve complex engineering problems.

- **Problem analysis:** Ability to use appropriate knowledge and skills to identify, formulate, research in the literature, analyze, and solve complex engineering problems. In this way, substantial conclusions are reached using principles of mathematics, natural sciences, and engineering sciences.
- **Solution design/development:** Ability to design solutions to complex engineering problems, as well as to design systems, components, or processes that meet specific needs, taking into account appropriate considerations for public health, safety, relevant standards, as well as cultural, social, economic, and environmental aspects.
- **Research:** Ability to conduct research on complex problems using appropriate knowledge and methods, including experimental design, data analysis and interpretation, and information synthesis to provide valid conclusions.
- **Use of modern engineering tools:** Ability to appropriately create, select, apply, adapt, and extend modern engineering and information technology techniques, resources, and tools, including the exploration and modeling of complex engineering problems, with an understanding of the associated limitations.
- **Engineering and the world:** Level of knowledge and responsibility for sustainable development. When solving complex engineering problems, the impacts of sustainable development on society, the economy, sustainability, health and safety, legal frameworks, and the environment are analyzed and evaluated.
- **Ethics and fairness:** Ability to apply ethical and fairness principles, committing to justice and professional practice, with responsibilities and international standards of engineering practice.
- **Individual and team work:** Ability to work effectively individually or as a member or leader of diverse teams in multidisciplinary settings.
- **Communication:** Ability to convey complex engineering concepts within the profession and to society at large. These skills include: the ability to understand and write reports and design documentation effectively, give effective presentations, and give and respond to clear instructions. The ability to communicate in a second language should be encouraged.

- **Project and financial management:** Ability to appropriately incorporate administrative, economic, and business practices, such as project management, risk management, and change management, into engineering practice, as well as understanding their limitations. An understanding of the basic aspects of technology-based business creation and management is also desirable.
- **Lifelong learning:** Ability to recognize the need for continuing education and the ability to engage in independent learning throughout life, identifying and addressing one's own educational needs in a context of widespread technological change.

Self-evaluation: A moment in which the internal coherence of the degree program is evaluated, primarily by verifying the degree of effectiveness in meeting the established objectives, the development of related processes, and the use of available resources. The self-evaluation is carried out by the members of the academic community themselves, who are responsible for and involved in the degree program. Its purpose is to gain a deep understanding of the state of the degree program with a view to its continuous improvement. The analysis and results of this process serve as inputs for both self-regulation and the preparation of the external evaluation.

Degree audit: Monitoring and control activities carried out to verify that all policies, procedures, and regulations are applied and complied with by all people who are admitted to, remain in, and complete the program's educational process.

Self-regulation: Action and effect of the academic community itself to correct actions detected as deficient in a self-evaluation process, adjusting them to the established objectives.

Broad foundation for engineering practice: Training process focused on developing the general attributes that enable entry into professional practice and facilitate subsequent specialization in a specific professional field.

Quality: It is an abstract and relative (comparative) concept, multidimensional, which is generally associated with excellence, efficiency, the satisfaction of expectations, and conformity to stated purposes.

Quality manifests itself in two components: coherence and consistency, which are divided into internal (merit) and external (value). Thus, the degree of alignment between the actions and outcomes of a study program with respect to its defined purposes determines its internal coherence.

The degree to which a study program conforms to previously defined and accepted criteria (accreditation criteria) determines its external consistency.

Program quality: Operationally, a study program is considered to be of high quality if it provides relevant training, evidenced by having the conditions, resources, and effective results that contribute to the achievement of the attributes of graduates.

Career: Organizational unit of an academic institution that integrates the inputs, processes, contexts, and outcomes necessary to train a person in a given field or profession, develop research projects, carry out outreach activities with the community, manage innovation in its processes, goods, and services, and link academic practice with the professional and productive sectors.

Academic and administrative career: Process of professional development, growth, and maturity in academic or administrative roles, which characterizes, distinguishes, and values their status based on their merits and experience. This is normally manifested through a hierarchy whose levels indicate progression and the different grades to be achieved in accordance with the fulfillment of established requirements.

Categories: General units of analysis into which a study program is broken down for the purpose of determining its value and merit. They constitute the different elements of a study program that interact with each other and have their own characteristics that differentiate them from the others. As an evaluation strategy, each category is broken down into criteria, which in turn are broken down into indicators and standards that are

used to analyze, measure, and rate the effectiveness and compliance of an academic program in order to ensure that it meets the necessary conditions for providing relevant training. For the purposes of this reference model for accreditation, five categories are established: curriculum, academics, infrastructure, program administration, and students/graduates.

Academic cycle: Also called the teaching cycle, this is the minimum period established for the development of training activities. For the purposes of accreditation with the AAPIA, this must be greater than or equal to 45 hours of training.

Engineering Sciences: The content of engineering sciences is based on mathematics and natural sciences, but focuses on creative applications. It involves the use of mathematical techniques or numerical analysis, as well as simulation, modeling, and experimental methods. Emphasis is placed on identifying and solving practical engineering problems.

They may include several of the following aspects, depending on the nature of each discipline: strength of materials, thermodynamics, fluid mechanics, solid mechanics, electrical circuits, electronic systems, automatic control, environmental sciences, soil mechanics, computer science, transport phenomena, materials science, aerodynamics, or geotechnics.

Natural sciences: These are disciplines dedicated to the study of nature. They deal with the physical aspects of reality and are based on logical reasoning and the methodological apparatus of the formal sciences, especially mathematics and logic, whose relationship with reality is indirect. As a curricular area of an engineering study plan, they include chemistry, physics, biology, and geology.

Coherence: That which manifests a stable, logical, and appropriate relationship between two or more things, parts, or elements, such that there is no contradiction or opposition between them.

Commitment: The willingness, consistent and coherent action of a person or institution to assume responsibilities and meet established objectives, demonstrating dedication and continuous effort toward achieving results that generate a positive impact. Three levels of maturity can be established in commitment to an object of interest: awareness, ownership, and empowerment.

Conformity: Suitability or correspondence of things with each other, with respect to their purpose, form, or function.

When referring to the rating of a criterion, conformity corresponds to the value judgment made when comparing the indicator or indicators with the established standard or standards. It can take four different levels:

- **C+:** The program exceeds all minimum benchmarks for the criterion evaluated. The aspect evaluated is a clear strength of the program. In the evaluation of a criterion, compliance is considered more than acceptable.
- **C:** The program meets all minimum benchmarks for the criterion evaluated. The program performs normally in the criterion evaluated, and the trend shows that the aspect evaluated will become a strength of the program in the near future. In the evaluation of a criterion, compliance is considered acceptable.
- **C-:** The program meets the minimum standards for the criterion evaluated or most of them, but there is evidence of a trend or potential risk of non-compliance in the near future. The aspect evaluated indicates a weakness in the program and is therefore a cause for concern. In the evaluation of a criterion, compliance is considered slightly acceptable or marginal. With regard to criteria identified as “desirable,” this indicates non-compliance, which must be addressed as part of the improvement project.
- **N:** The program does not fully meet the minimum standards for the criterion evaluated. The aspect evaluated is a deficiency of the program. In the evaluation of a criterion, compliance is considered unacceptable. This rating does not apply to criteria marked as “desirable.”

Curriculum content: See study plan.

Consistency: Refers to the solidity, stability, and security of the object of interest.

Appropriate: Useful, timely, beneficial. Referring to an accreditation criterion, it establishes a compliance relationship that is not mandatory but is considered beneficial for improvement and therefore relevant for consideration. It is the responsibility of each degree program to establish and justify the appropriate indicators it deems appropriate, where applicable. In the event of non-compliance with a criterion designated as “convenient,” the grade to be awarded will be C- and not N.

Criteria: These are the evaluative principles that regulate the manifestations of the object of evaluation and are manifested in various dimensions. They correspond to the aspects or characteristics specific to each category of evaluation, into which these are broken down for evaluation purposes.

Requirement: This is understood as an obligation in relation to an accreditation criterion, establishing a necessary compliance relationship for improvement and, therefore, its consideration is not optional.

Weakness: Characteristic of compliance with an accreditation criterion to such an extent that it cannot be classified as a strength, since only the minimum requirements established by the benchmarks or standards are met.

Deficiency: Failure to comply with an established criterion by not fully meeting the minimum requirements set by benchmarks or standards. It is a consummate weakness.

Sustainable development: An approach to progress that seeks to meet the needs of the present without compromising the ability of future generations to meet their own needs. It is based on three fundamental pillars: economic growth, social inclusion, and environmental protection.

Diploma: Document certifying that a person has obtained an academic degree or title in a specific field, having successfully completed the associated educational process.

Engineering Design: Engineering design integrates knowledge of mathematics, basic sciences, engineering sciences, and complementary studies in the development of elements, systems, and processes to meet specific needs. It is a creative, iterative, and often “open-ended” process, subject to the constraints of technical standards, economic, social, legal, environmental, occupational health and safety, or interdisciplinary considerations.

Sustainable design: Engineering design that considers social, economic, and environmental aspects, as well as technical aspects, and their interrelationships and interactions.

Teaching: A substantive function of academic practice that seeks to transmit, construct, and appropriate knowledge, skills, and attitudes through dialectical processes of teaching and learning.

Effectiveness: Certainty of achieving the desired objectives, results, or effects, so that they will be even better in the future.

Effect: Immediate result or consequence, whether premeditated or not, of an action or project.

Efficiency: The ability to achieve a goal using the best possible means and optimizing resources.

Curriculum focus: Each of the curriculum categories, or broad subject areas, linked to the subject matter of the degree program.

Transversal axes: In an academic curriculum, the transversal axes refer to objectives and contents that are the object of study that are developed throughout the curricular mesh and constitute articulating instruments of generic capacities to be developed throughout the training process.

Empowerment: Referring to maturity in commitment, this is linked to the highest level and describes the behaviors or evidence that indicate that the person has reached a level

where they not only master the aspect being evaluated, but also act as a leader and catalyst, promoting significant changes related to the topic.

Equity: Balance, fairness. It is the quality of giving each person what they deserve based on their merits or circumstances, without favoring one person over another.

Weak link: Refers to the qualitative indicator that denotes the highest degree of non-compliance with an accreditation criterion or set of criteria and, therefore, connotes an obvious weakness or deficiency, as appropriate.

State of the Art: Understood as the current state or situation, latest advances, or state of the art, as applicable.

Student: A person who is studying for a specific degree, fulfilling their duties and earning the rights associated with their education.

Students (or student body) and graduates: Category that evaluates the means and resources that enable compliance with the admission profile, vocational consolidation, student retention and performance, as well as the engagement and feedback of graduates of the training program.

Complementary Studies: These comprise content that enables comprehensive training and complements the technical studies in the curriculum. This category includes topics and subjects in the humanities, social sciences, administration, the impact of technology on society and the environment, sustainable development, professional ethics, leadership, teamwork, occupational health, and oral and written communication.

Evaluation: A structured and reflective analysis process that allows us to understand the nature of an object of study and make value judgments, providing information on which to act. As a process, evaluation involves gathering information, analyzing it, and interpreting it in light of a frame of reference, which enables decision-making.

Evidence: Probative material that makes it possible to refer truthfully, clearly, and distinctly to the value and merit of the current status of the program in terms of a specific

criterion with the highest possible degree of certainty. Evidence is expected to reflect the current status of the program in the aspect under consideration in a reliable and unobjectionable manner.

Excellence: Superior quality or goodness that makes something or someone worthy of appreciation and esteem. That far exceeds the standard or average performance.

Learning experiences: Opportunities and deliberate actions that are planned, executed, and evaluated with the purpose of helping students develop meaningful knowledge, skills, and attitudes that encompass the attributes of graduates.

Laboratory experience: Practical learning activity in which, through experimentation and empirical verification, theoretical postulates on a given topic are tested or hypotheses are tested within the framework of research, testing, or design.

Laboratory, workshop, or field experience: Practical activity developed under the learning-by-doing model, carried out in locations other than classrooms or auditoriums, outdoors or in the work environment, a company, or a professional project in development.

Significant design experience: Practical achievement that satisfies a need or solves an engineering problem, concluding the training process in which the skills acquired during the process are integrated and articulated, and the established attributes are demonstrated.

Extension: Refers to all effective social outreach activities related to the degree program (see also social action).

SWOT: Situation analysis, referring to the strengths, opportunities, weaknesses, and threats of some aspect of the program. The purpose is to guide decision-making and establish improvement actions to overcome weaknesses, mitigate threats, maintain strengths, and take advantage of opportunities.

Relevant training: An educational process aligned with the needs and demands of the professional, social, and productive environment, with an explicit commitment to sustainable development. This implies that the curriculum, content, teaching methods, and learning outcomes are designed to equip students with the skills, knowledge, and abilities to respond effectively to current and future labor market requirements, while promoting responsible and ethical practices in relation to the environment, society, and the economy, addressing the specific challenges of engineering in its regional, national, and international context.

Strength: Characteristic of compliance with an accreditation criterion to such an extent that it can be classified as a strong point, since it exceeds the levels of requirement established by the benchmarks or standards.

Substantive functions of academic work: Refers to the set of activities that characterize academic work. It includes university teaching, research, social outreach, innovation, and links with the professional and productive sectors.

Curriculum management: Development of policies, procedures, and practices carried out by program directors, administrative support, and academic staff to coordinate, plan, monitor, and evaluate the educational process offered.

Academic degree: A differentiated level that marks the completion of an educational process and refers to the academic value of the knowledge and skills acquired. According to the nomenclature of degrees and qualifications in Costa Rican higher education, there are three levels: undergraduate (diploma and teaching qualification), degree (bachelor's and licentiate), and postgraduate (professional specialization, master's, and academic doctorate).

Modern engineering tools and instruments: Up-to-date equipment and materials used in professional engineering practice.

Heterogeneous evaluation: Stage of the accreditation process in which the external consistency of the study program is primarily evaluated. Heterogeneous evaluation is carried out by external “academic and professional peers” who are considered qualified

evaluators and who, from the objectivity afforded by their position, are responsible for issuing an assessment report on the program under evaluation, indicating whether or not it complies with the established criteria.

Environmental hygiene: The science of anticipating, identifying, assessing, and controlling risks that originate in or are related to the workplace and that may endanger the health and well-being of workers, also taking into account their possible impact on neighboring communities and the environment in general.

Suitability (suitable): A characteristic of a person or object of interest that reveals that they are convenient, apt, capable, useful, appropriate, adequate, and that they have the conditions to perform a job or carry out certain functions or tasks, as well as achieve objectives.

Infrastructure: Set of buildings, equipment, materials, and common spaces that support the substantive areas of academia: teaching, research, social outreach, innovation, and links with the professional and productive sectors. Category that evaluates the aspects indicated.

Indicators: These constitute the evidence or sources of evidence used to assess evaluation criteria, demonstrating their qualities or properties. Indicators can be qualitative or quantitative. They are compared with a specific standard or benchmark in the process of evaluating a particular criterion.

Academic performance indices: Numerical guidelines that establish aspects related to student academic success (see course pass rate, terminal efficiency rate, dropout rate, retention rate).

Innovation: Design and implementation of novel and significant changes in any of the substantive functions of academia, its products, processes, marketing, or organization with the purpose of improving results, impacts, and effects.

Impact: The most relevant and significant result, positive or negative, as a consequence of an action or project.

Research: Substantive academic function of knowledge construction through the application of the scientific method, which can lead to expanding the theoretical knowledge base in a given field, solving problems, or meeting needs.

License and professional certification: Certificate and authorization certifying suitability for ethical and competent practice in a professional field.

Curriculum structure: Also known as a curriculum map, this is a graphical representation of the curriculum that provides an overview of its general structure. It includes the areas of development, subject areas or curriculum categories, the subjects (name, brief description, code, and number of credits), their organization, and sequence. If the curriculum includes cross-cutting themes, these are also indicated.

Mathematics: Curriculum area of the Engineering program, whose minimum content includes Multivariable Differential and Integral Calculus, Linear Algebra, Descriptive and Inferential Statistics, Probability, Numerical Analysis, and Differential Equations.

Majority: Part of a set or group that represents the largest or highest percentage thereof. For the purposes of accreditation with the AAPIA, the reference to a majority is qualified and represents at least 75% ($\frac{3}{4}$) of the set of interest.

Measurement: This is part of the evaluation process (evaluation encompasses measurement), associated with the collection of information, which, if quantified, can be compared with a parameter or standard of interest. Measurement expresses an absolute value; it is a static moment, not a process, and does not imply evaluation, but it is a means of assessment. It culminates in the formal moment when it assigns a rating (based on the levels of a defined rating scale) to the object of interest, comparing its status with established standards.

Means, tools, and indicators: In the process of incorporating the attributes approach into the training process, these three aspects refer to teaching strategies, means of assessment, and instruments for establishing performance in the acquisition of the competencies (knowledge, skills, and attitudes) that define the attributes of graduates.

Continuous improvement: A repeated process of planning, execution, evaluation, and correction that seeks to exceed established goals or aspirations, minimizing or eliminating errors or deviations.

Meta-evaluation: Comprehensive evaluation of the entire accreditation process, standards, procedures, actors, and results, with the aim of continuously improving it.

University level: Also understood as academic level, this refers to education leading to an academic degree. The classification of degrees according to their level is listed in ascending order in:

FIRST LEVEL: UNDERGRADUATE: Diploma and Teaching Degree.

SECOND LEVEL: DEGREE: Bachelor's and Licentiate Degree.

THIRD LEVEL: POSTGRADUATE: Professional Specialization, Master's, and Academic Doctorate.

For the purposes of accreditation with AAPIA, second-level training programs are considered eligible for accreditation.

Common core: Refers to the set of subjects, objectives, or study content that the program under evaluation shares with other engineering programs, giving the program's initial training a universal and multidisciplinary character.

Sustainable Development Goals (SDGs): These are an initiative promoted by the United Nations to continue the development agenda. They seek to achieve common well-being, peace, and prosperity, satisfying the current needs of all human beings without compromising the resources and possibilities of future generations. There are 17 goals and 169 targets that address interconnected issues such as economic growth, social inclusion, and environmental protection.

Opportunity: Convenient in a given context. Convergence of an appropriate space and time period to obtain a benefit or achieve a goal.

Stakeholder: In the context of engineering program accreditation, a stakeholder is any individual, group, organization, or entity that has a direct or indirect interest, influence, or impact on the quality, development, outcomes, and reputation of the academic program.

Academic curriculum: See study plan.

Admission profile: Set of minimum initial abilities (knowledge, skills, and attitudes) that an applicant to a university degree program must possess and demonstrate in order to have a high probability of successful performance in their educational process.

Academic-professional profile: Set of minimum attributes that a person must possess upon graduating from a training program.

User profile: Set of physical, cognitive, or technical characteristics of those who use a good or service.

Graduate: A person who has successfully completed the educational process and has earned a diploma certifying this achievement, awarded in a formal ceremony in which they pledge by oath to fully comply with the duties and rights conferred upon them by their status.

Academic staff: Individuals who are part of the university community and perform one or more of the following functions: teaching, research, outreach, innovation, community engagement, or administrative management for the program. This category evaluates the qualifications, experience, and continuing education of those who perform the aforementioned functions.

Relevance: Also understood as pertinent. Convenient, appropriate, or timely, relevant to the objectives desired or sought. Referring to the fulfillment of a criterion or aspect thereof, it refers to the implementation of the actions and provisions necessary and sufficient to achieve the proposed objective.

Regarding training, it refers to the adaptation of the training process to the needs and demands of the social, economic, and cultural environment, ensuring that graduates develop the necessary skills for competent professional practice, a commitment to sustainable development, and ethical conduct in their discipline.

Curriculum: A structured set of interrelated subjects, objectives, content, resources, activities, and learning assessment strategies that define the academic training that a student must follow to obtain their academic degree in a specific field or profession. This category evaluates the aspects indicated.

Operational plan: Document derived from the strategic plan or orientation that specifies the activities, goals, schedule and those responsible for the execution of these.

Strategic plan or orientation: Document that includes the economic-financial, strategic and organizational planning that a company or organization has to address its objectives and achieve its future mission.

Virtual educational platform: Also known as LMS (Learning Management Systems), it is a computer system designed to facilitate the teaching and learning process over the internet. This platform allows interaction between students and teachers, access to educational resources, progress assessment, and real-time collaboration.

Concern: A qualitative indication that a program meets an established criterion, but there is a potential risk of non-compliance in the near future. It is expressed when a program weakness has the potential to become a deficiency.

Strategic Processes: A set of stages that define, verify, and control the organization's policies, strategies, objectives, and goals.

Operational or tactical processes: Set of specific stages that generate value-added goods and services for the user.

Support processes: Set of necessary stages that support the achievement of operational processes.

Product: Good or service derived from one or more processes based on certain inputs, context and limitations.

Profession: Field of human endeavor that empowers one to perform specialized functions ethically and competently, as a result of training obtained through formal studies at a higher education institution and experience gained in developing knowledge, skills, and attitudes in that field.

Professional: A person who practices a profession by virtue of the license and qualification granted by a professional association for voluntarily adhering to the principles of conduct and good practices established.

Program: One of the objects of evaluation in an accreditation process. It encompasses all educational activities and experiences, as well as material and management conditions, that enable the training of an individual in a defined professional field. A program is characterized by a formally approved and published curriculum, which is considered an entity by the institution and can be considered independently, distinguishing itself from other training efforts offered by the institution. In some sections, it is used as a synonym for degree.

Maintenance program: It is the element in an asset management model that defines the periodic preventive, predictive and detection actions, timely with the objectives of improving their effectiveness, it involves defining the activities to be carried out, the procedures, frequencies, control variables and the resource budget.

Ownership: Also understood as ownership contract. It refers to a contracting modality that establishes the permanence and uninterrupted job stability of academic staff within the career civil service payroll.

Recommended: See convenient.

Minimum benchmark: Also known as a standard. It is considered the minimum parameter required to consider the program's achievement satisfactory in terms of one of its indicators. In the evaluation process, "measurement" occurs when the evaluator

compares the program's status with one of the indicators and the minimum benchmark established for it.

Incident log: In the field of safety, occupational health, and environmental hygiene, this involves documenting, in some form, a deviation from an expected standard operation or recording the occurrence of an event or contingency. It can also identify the people affected by an incident and the people responsible for taking action after the incident occurs. It can also specify the type of follow-up action to be taken.

Relevance (relevant): The importance or significance that stands out about something. It refers to a formative, academic, or professional experience, and indicates that it contributes significant value to the process.

Responsibility: Ability to respond with diligence, dignity and balance to the commitments made.

Results: In a systemic view, these refer to the outputs that derive from one or more processes based on specific inputs, context, and constraints. At least three types of results can be distinguished: products, effects, and impacts.

Learning outcomes: What students are expected to know, understand, appreciate, and be able to do upon completion of an educational program. These outcomes should be measurable, observable, and aligned with the program's educational objectives, providing a framework for assessing student achievement in relation to the skills and abilities needed in their field of study, especially the attributes of graduates.

Sabbatical Leave (or Sabbatical): A leave of absence that authorizes a specific period of time to rest from work and normal work or academic responsibilities. It is generally used for the personal, academic, or professional development of the person taking the leave.

Occupational health: It is the social, moral and legal responsibility of the employer to adopt activities in the workplace that lead to: a) Promoting and preserving the health of

the worker; b) Preventing any harm that working conditions could cause to the worker; c) Protecting health from harmful risks resulting from working conditions; d) Guaranteeing the worker a job in accordance with their physiological and psychological capacities; e) Adapting the conditions of the task to the worker.

Safety: This concept, within the workplace, is the set of actions that, applied to production processes, work with machines, facilities and even worker habits, can prevent and avoid work accidents.

Awareness: Refers to the maturity of commitment; it corresponds to the first level and describes the degree of initial consciousness or exposure of a person toward the area of interest. It defines the behaviors and evidence that indicate the person is beginning to become aware of that aspect.

Significant: Something that is important because of what it represents, as it connotes and denotes a certain value. For criteria that require a quantitative indicator to establish significance in a particular aspect, the numerical data must be provided by the program and appropriately justified.

Internal Quality Management System (IQMS): The IQMS is a set of mechanisms that allow the program to critically evaluate the quality of its services in order to develop improvement plans. The IQMS establishes guidelines and tools for self-assessment and self-regulation, and is conceived as a tool for planning, executing, and controlling the activities necessary for the development and achievement of the program's mission objectives.

Sufficiency: Suitability, capacity, willingness, aptitude, or minimum level for something. For criteria that require a quantitative indicator to establish sufficiency in some aspect, the numerical data must be provided by the program and appropriately justified.

Course Pass Rate: The arithmetic mean of a course's pass rate, calculated with respect to the enrolled student population that has successfully met the minimum promotion threshold. This indicator reflects students' ability to fulfill the academic requirements of

the course and may serve as an indicator of teaching effectiveness and the adequacy of the curriculum content.

Graduation Efficiency Rate: The arithmetic mean of the student population that successfully completes their studies within the time frame stipulated in the program's curriculum. This index serves as an indicator of the academic program's efficiency, as it reflects students' ability to progress regularly and complete their studies without significant delays.

Dropout Rate: The arithmetic mean of the student population that leaves their studies in the program under evaluation before completion.

Retention Rate: The arithmetic mean of the student population that continues in the program after the first year of study.

Full-Time (FT): Considered as fulfilling a work schedule of 40 hours per week

Part-Time (PT): Considered as fulfilling a work schedule of less than 40 hours per week.

Full-Time Equivalent (FTE): The total sum of time corresponding to the work contribution of those working under the part-time modality, combined with those working full-time.

$$FTE = [\sum (TP/40) + \sum (TC)]$$

Title: This is one of the elements contained in a diploma and designates the subject of knowledge or human endeavor in which the individual has acquired certain skills and abilities. The title, in its simplest sense, designates the area of action in which the individual has been trained and educated.

Transparency: Consistency between what is said and what is done, both aspects being known to stakeholders. A course of action guided by sincerity and a willingness to provide all relevant information.

Accreditation Unit: The AU are defined for activities that grant academic credits and for which the number of hours granted corresponds to the actual time of interaction between teacher and student, in this way:

- One hour of face-to-face class (corresponding to 50 minutes of activity) = 1 AU
- One hour of laboratory, workshop, tutorial work, or practice = 0.5 AU

This definition applies to most theoretical classes or lessons, laboratory practices, workshops, or tutorials. Classes or lessons that are not the nominal duration of 50 minutes are calculated proportionally to their actual duration.

Preparatory or leveling activities that do not grant academic credits should not be considered in the calculation of the program's accreditation units.

For an activity in which faculty-student interaction hours cannot be used to fully describe the scope of the work it represents, such as major design or research projects, or similar work officially recognized by the institution as a degree requirement, the institution must use an equivalent measure in accreditation units.

To determine this equivalence, the definition of academic credit, accepted by the competent entities, applied by the institution to these activities is used.

A K factor can be calculated to transform these credits to AU, by performing the following division:

$\sum AU$ (for all common and mandatory core courses of the program for which the calculation was made by hours).

$$K = \frac{\sum AU}{\sum \text{academic credits defined by the institution for the same courses}}$$

For training processes conducted remotely or virtually, the definition that applies is **Credit Unit (remote or virtual): CUs** are defined for activities that award academic credits and for which the number of hours assigned corresponds to the actual time of interaction between the student and the scheduled learning activity, as follows:

- One hour of theoretical activity (corresponding to 50 minutes of activity) = 1 CU

- One hour of laboratory, workshop, tutorial work, or practice with measuring equipment, virtual, remote access, or simulation = 0.5 CU

If a program offers a dual program with in-person training sessions and training sessions offered remotely, synchronously, or asynchronously, the total UA calculation must be presented both separately and in a consolidated form to verify the total.

Universality: Of universal quality or character. A fact or idea that encompasses or is for everyone.

Validity (valid): That which is consistent, plausible or admissible.

Engagement: A substantive function of academic activity aimed at fostering relationships and developing joint projects with the professional or business sector to meet needs or address technical, technological, or scientific problems in the context of sustainable development.

7. Periods and events

PROCESS STAGES	PERIOD	DATES	EXECUTING UNIT
Self-Assessment	Decision taken by the Institution		University
Submit accreditation application and self-assessment document	Reception of Documents		
	I period	Last two weeks of January	University
	II period	Last two weeks of July	
Acceptance start accreditation process	Notification to the University		
	I period	Last week of February	Council
	II period	Last week of August	
Selection of evaluation team and analysis of documents	Appointment of the evaluation team		
	I period	Last two weeks of February	Council
	II period	Last two weeks of August	
Notification to the University of members of the evaluation team	I period	Last two weeks of March	Council
	II period	Last two weeks of September	
Visit to the program	I period	Beginning of May	Evaluation team
	II period	Beginning of November	
Evaluation team report	I period	Third week of June	Evaluation team
	II period	Third week of December	
Accreditation decision	I period	Last week of August	Council
	II period	Last week of February	
Appeal for review (if requested)	I period	Last week of September	University
	II period	Last week of March	
Final accreditation decision	I period	Last week of October	Council
	II period	Last week of April	