**SELF-EVALUATION GUIDE FOR ACCREDITATION**

**under international criteria**

**of Science-Based Engineering programs**

VERSION 2.0

**Valid for the 2023-2024 accreditation cycle**

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## INTRODUCTION

The Colegio de Ingenieros de Chile S.A. Accreditation Agency, Acredita CI, presents this Guide that describes the format of the Self-Assessment Report that a science-based engineering program must present to the Agency in its accreditation process under international criteria. The accreditation process seeks that the program demonstrates that it meets the evaluation criteria.

##  THE SELF-EVALUATION PROCESS

For the accreditation process, the program carries out a critical, detailed and reflective analysis of compliance with the 9 evaluation criteria of Acredita CI. This process is called the self-assessment process.

Self-assessment is always an internal form of evaluation that is aimed at strengthening the collegiate management capacity of the unit to lead to a systematic planning of actions to improve the training received by students of the major and to follow up on them, which strengthens the internal culture of quality because quality is focused on student learning. The quality evaluation criteria of Acredita CI are oriented in this sense.

Self-assessment makes it possible to establish a diagnosis regarding the state of development of the program at a moment in time, contrasting it with the evaluation criteria and with its purposes. If the course is taught in different locations, daytime or evening schedules or modalities, the diagnosis must consider each locations, daytime or evening schedules or modalities separately, since each one of them has the duty to ensure the same level of performance according to the purposes of the program, in the Unit on which it depends and the Institution itself.

When the program presents two current study plans, a plan that is ending that has graduates practicing the profession and a plan as a result of a curricular innovation process that still does not present graduates, **the process will focus on the study plan with graduates** because innovated plans without graduates will be treated as antecedents of continuous improvement in the training process.

In accordance with the provisions of the **Master Manual for scientific-based engineering accreditation version 1 cycle 2023 - 2024**, the Evaluation Criteria are defined in themselves, however, "aspects to consider" are added to these criteria to facilitate and refine the assessment. The analysis of each criterion, as well as the aspects to be considered, will lead to a conclusion regarding the degree to which each criterion is fulfilled.

For the process, it is advisable to set up a Self-Assessment Committee that includes representatives of the community related to the program (managers, teachers, students, administrators, graduates, employers, etc.). The constitution of the self-assessment committee or the beginning of the process constitutes a relevant event in the program, which suggests carrying out a specific activity to disseminate the beginning of the process to introduce the members of the committee and explain to the community its scope, seeking with it the maximum collaboration

* + 1. **STAGES OF THE SELF-EVALUATION PROCESS**

**ORGANIZATION AND WORK PLANNING**

To achieve maximum efficiency, define a work plan that includes: a calendar for the start and end of the process, distribution and assignment of tasks, and definition of the necessary resources (human, material, and computer) for it. In addition, it is important that the decisions made by the different agents collaborating in the process are agreed upon.

The program will explicitly define the closing date of the period under evaluation with the purpose of ordering the information for the analysis. For example: to December of the previous year; and in accordance with the planning, it will advance in meetings for analysis and consensus on the decisions to be made, by comparing the evidence against the evaluation criteria.

Good practices suggest writing the Self-Assessment Report as progress is made in the analysis of the criteria for which the program will explicitly define those responsible for its writing.

**DEVELOPMENT OF SELF-EVALUATION**

Since the self-assessment process for accreditation is based on the analysis of the program situation regarding compliance with the 9 evaluation criteria of Acredita CI; this analysis must be based on **evidence** that has been collected from the training process since the last self-assessment process or from a complete cohort, from the first to the last semester of the study plan, which are reliable evidence that supports the statements and assessments made by the Self-evaluation Committee of the program regarding the fulfillment of the evaluation criteria.

The information must include evidence of the measurement, evaluation, and achievement of their graduate profile and of the graduate's attributes in each location, daytime or evening schedule, and modality of the period under evaluation, and will make a critical analysis of the mechanisms to measure, evaluate, and verify this achievement. The result of this analysis will be presented in the Self-Assessment Report when contrasting it with the evaluation criteria.

**Scopes of work to be developed**

The result of the self-assessment process will be described in the Self-Assessment Report so that it allows an external person to read and understand it properly. The program may incorporate all the annexes to the report that it deems necessary, referring to each criterion, to support the judgments that it declares in the Report. In particular, in terms of best practices for presenting the Self-Assessment Report, each statement or citation of the decisions that are made or of the actions that are carried out, as well as the results that are reported, must be presented with supporting evidence.

In the self-assessment report, the program will describe compliance with the evaluation criteria, for each aspect to be evaluated, to then determine an assessment of the criteria, in general.

For each criterion, the program will define if it presents any weakness, meaning a weakness, an aspect that is not met, because it is under development or because it does not exist.

If the program detects an aspect that is not fulfilled, because it is non-existent, it will make substantial efforts to resolve this weakness prior to submitting to the accreditation process. An aspect as Does not meet – Non-existent is synonymous with the evaluation of the criterion in that quality. According to the definitions of Acredita CI, a program with a criterion at this level of evaluation will not achieve accreditation. And this is the main reason why carrying out an objective and critical self-assessment process makes it possible to detect these results and define immediate improvement mechanisms to resolve the weakness.

The program will decide which of their weaknesses will immediately solve and which require additional efforts. The latter will be incorporated into an improvement plan. The improvement plan will reflect the program's commitment to actions that will resolve the weakness.

As indicated in the Rules and Procedures Manual, each program must submit its self-assessment report to the process, separately, even when they share management in the same Unit, and if the course is taught at different locations, daytime or evening schedule and modalities, the Self-Assessment Report will continue to be drawn up by degree, but will include the analysis of the evaluation criteria separated by each locations, daytime or evening schedule and modality, when appropriate and necessary. The program must be explicit in indicating whether the evaluative judgment refers to the program as a whole if it is not referring to a locations, daytime or evening schedule and modality in a specific way.

All the information shared by the programs as a result of the dependency of the same academic unit may be replicated in the report of each program where appropriate. This is because it is necessary to evaluate each program separately, based on verifying the results of each one of them.

**Collecting information**

Those responsible for the program will establish the necessary mechanisms to collect and organize all the information required in tables 1, 2 and 3 requested by Acredita CI and detailed in this Guide, so that it is accessible to the Self-Assessment Committee in a timely manner. The information requested by the evaluation criteria refers to the administrative management that supports the program and mainly to the results of the training process and student learning. If the program is taught in various locations, daytime or evening schedules and modalities, the information must be collected separately for each of them for analysis and conclusions.

If the program presents two current study plans, the information to be collected on the study plan with graduates will be the focus throughout the process, but the program must also present information on the innovated plan and the results of its progress, to demonstrate the continuous improvement.

The program may incorporate all the evidence it requires to demonstrate its statements for each criterion in the Annexes to the Criteria. In the same way, external evaluators could request additional evidence during the preparation of the process, prior to the visit of the accreditation process, with the purpose of obtaining in-depth information on the activities carried out by the program to meet the evaluation criteria.

The self-evaluation process focuses on the mechanisms used by the program to achieve the evaluation criteria, synonymous with ensuring quality. It is essential that the program demonstrates achievement of the graduate profile, which includes the graduate attributes required by Acredita CI.

The self-assessment process collects evidence of the work carried out in the program at a certain closing date, analyzes it considering the evaluation criteria, and with this, assesses compliance. The program presents this evidence in the Self-Assessment Report to demonstrate this compliance, explaining the mechanisms described in the definitions of the previous paragraphs, the improvement decisions that it makes and the results of its application, according to the requirements of the criteria of assessment.

It is necessary that the description of the program of fulfillment of the criterion is made as a result of consensus among the members of the community that participate in the elaboration of the self-evaluation report, with the active participation of the teachers. The broad participation of the community that makes decisions related to the program is an important element of the process because it strengthens their commitment to the program, incorporates objectivity, strengthens their self-regulation capacity, and validates the development of the process and its conclusions.

As a result of the self-assessment process, the program will identify your strengths and weaknesses. Strengths are elements that stand out in the program, recognized by the related community. Weaknesses are evaluation criteria that are not met, which is why they generate room for improvement.

**SPECIAL CASES**

**Multiple locations, daytime or evening schedules and modalities**

In the case in which the program is taught in several locations, daytime or evening schedules or teaching-learning modalities (face-to-face, distance or blended, in special programs or continuity of studies) the information for the different criteria and aspects to be considered must be presented disaggregated, because the evidence of student learning achievement must be analyzed disaggregated by each location, daytime or evening schedule and modality. That is why, during the development of the self-assessment process, the program must do its best to solve the weaknesses if they are verified in any of the locations, daytime or evening schedules or modalities and/or commit improvements to match the performance of each one of them. them towards the one with the best performance.

**Study plans with curricular innovations**

If the program has two current study plans, one with graduates and an innovative study plan, the program must focus the self-evaluation process on the study plan with graduates, because they are the evidence of the results of the program and the innovated study plan will be recognized as evidence of continuous improvement, because the evaluation perspective (internal from the program course and external from peer evaluators) is integral to the entire training process. The program will present both study plans to the process and will analyze them separately, but in the same report, according to the requirements of the evaluation criteria.

To do this, the program must demonstrate that the graduates of the previous plan that is ending (which is the plan that is being improved) possess the competencies or attributes of the graduate. At least the graduates of the last year. And must demonstrate that these skills are included in the innovated study plan that is the current plan, at least as part of the training process (because this plan still does not have graduates). In any case, it will depend on the progress in the innovated plan if there is evidence of the measurement of the graduate's attributes for this plan, since if there is, it can be presented as part of the process.

**DEFINITIONS**

Below are two figures that are intended to illustrate what has been described:

**Figure 1: the purposes of accreditation under international criteria**

Educational objectives: statement on the aspiration of the professional to be trained.

Graduate Profile/ Graduate Attributes

**Accreditation process**

**Advantages**

**The accreditation ensures that the graduate is prepared for the initial professional practice under a global benchmark graduate profile**

**Guarantees the quality of training received by students**

**Accredited Program**

**Professional Performance**

Indicator that the educational objectives of the program are met

Acredita CI suggests conducting the process for improving decision-making in the Unit and the program, according to the following Continuous Improvement Diagram.

 **Figure 2: Conceptual model for continuous program improvement**

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**Institutional Mission**

**Educational objectives of the program**

**Learning Outcomes**

(of subjects)

**Graduate Profile**

**Internal community and relevant external environment**

**Pedagogical Strategies**

(by subject and teacher)

**Feedback**

(Continuous Improvement)

Professional performance to which the program aspire

**Evaluation**

(analysis of evidence, verify results and make improvement decisions)

**Evidence System** (compilation of student work and tests)

****

**Definitions in Figure 2:**

**The educational objectives** are the statements made by the program about the aspiration of the professional it wishes to train and reflect the relevance of that professional. The educational objectives must be consistent with the institutional purposes, Mission and institutional seal. The achievement of educational objectives is verified by consulting graduates. The educational objectives guide the definition of the graduate profile of the program.

Acredita CI makes Table 9.3 of its Master Manual version 1 cycle 2023-2024 available to programs, called Professional Competence Profile. These competencies are the minimum competencies expected in the initial professional development of an engineer trained under the attributes of the graduate. It is recommended to verify the achievement of it with the graduates, incorporating these queries in the surveys for feedback purposes.

The **graduate profile** describes what students are expected to know and be able to do upon graduation. It refers to the knowledge, skills and attitudes that students acquire during their career advancement and that a program aims to achieve through the learning outcomes defined in the subjects.

The graduate profile must be oriented to achieve the educational objectives. Therefore, the suggestion is to validate the complete cycle by verifying with the graduates that the aspiration is achieved, which is irrefutable evidence of the achievement of the institutional purposes.

The **evidence system** consists of systematic mechanisms through which information is identified, compiled, and prepared, which is a selection of all the individual, group, and laboratory work, tests, exams, capstone projects, practical activities, among others, that the teacher designed to measure student learning (including graduate attributes), or that are part of the curricular activities and that the student responded or performed in the subject. It considers a systematic compilation work, which may be semester, and which ideally will include a cohort of students from their admission to their program.

The **evaluation** is the review, analysis and improvement decisions on the learning results of the students, which is based on the evidence that was collected through the evidence system described, with the purpose of improving learning and with it the progress of the students, in accordance with the purposes of continuous improvement of the program. Decisions for improvement will be strengthened when the decisions are made by collegiate bodies in charge of teaching management and may have an impact on all areas of the training process, for example: adjusting the graduate profile to educational objectives, adjusting the contribution matrix, the subject contents with the learning results, adjust the evaluation instruments, pedagogical strategies, infrastructure, student support, among others. This process is the essence of continuous quality improvement because it is used for the purpose of improving student learning and furthering the program progress. Aims to achieve the graduation profile and the final aspiration expressed in the educational objectives.

## MANDATORY ANNEXES

The program must present the following tables together with the Self-Assessment Report as mandatory annexes, in addition to the annexes indicated in Annex 1 in this Guide:

**TABLE 1**: Contribution matrix of the subjects to the graduate profile and the attributes of the graduate.

**TABLE 2**: correspondence between graduate attributes and learning outcomes of each subject.

**TABLE 3**: of progress in enrollment, retention and graduation of the last 10 years.

The format of the tables is presented in the Annex to this Guide. Table 3 is an Annex whose format is published on the Acredita CI Website, Engineering Accreditation Menu, Manuals and Forms Option.

## THE IMPROVEMENT PLAN

The Improvement Plan is a guide for future actions. This describes, in a prioritized manner, those actions that the program undertakes to carry out to overcome the weaknesses that were detected during the self-assessment process. The format for designing the Improvement Plan is provided in this Guide, point 2.6.-

## ASSESSING THE PROGRAM OF COMPLIANCE WITH THE EVALUATION CRITERIA

To assess the program of compliance with the evaluation criteria, the description of how the program is positioned for each of the criteria is first made. The program will provide a detailed description of the mechanisms by which it considers that it complies with the criterion, presenting substantive and irrefutable evidence as described above; to finally decide whether the criterion is met or not met, or whether there is any progress or simply no progress or this is non-existent in relation to results and its improvement mechanisms.

The evaluation of the criterion and its compliance, will be established according to the definitions delivered by Acredita CI: MEET; DOES NOT MEET-IN DEVELOPMENT; DOES NOT MEET-INEXISTENT, defined in the **Master Manual for Accreditation of Science-Based Engineering Programs** **version 1.0 cycle 2023-2024** (Hereinafter Master Manual) and set out below:

A criterion **is meet** when there is evidence that policies and mechanisms are known and applied systematically, showing results that are periodically reviewed.

Otherwise, we are in the presence of a weakness: the criterion **does not meet** and will be valued either as **in development** or as **inexistent**. A criterion that is not meet is in development when there is evidence that the policies and mechanisms are known and applied, with preliminary results, but there is no evidence yet that it is systematic. A criterion that is not meet is inexistent when the program has defects in its design or does not have formal or systematic policies or mechanisms in its educational process, or there are only statements, but without evidence of its application.

The program will be able to verify how compliance levels impact the accreditation decision, on pages 16 and 17 of the Master Manual of Acredita CI. It is suggested to review in detail those cases in which the program accredits for 3 years, for its importance.

The methodology described is intended to facilitate the work of the people responsible for the preparation of the report when assessing the situation of the program, in view of each of the criteria and characteristics required by the process. In the same way, it allows the program to assess its situation in front of the fulfillment of its purposes and institutional purposes, which strengthens its contribution to institutional accreditation.

## THE SELF-EVALUATION REPORT

This report should be written in simple and understandable language, thinking that it is being written for a third person who does not know the program or the institution.

It should explicitly guide its arguments to account for the achievement of the criterion under evaluation, **citing the evidence supporting evaluative judgment**. The evidence is attached as an annex for each of the criteria under evaluation. The arguments and evidence should clearly reflect the situation of the program in each location, daytime or evening schedule or modality in which it is taught or when there is more than one current study plan.

The Self-Assessment Report will be prepared in the format suggested below in this Manual.

The Self-Assessment Report may present strengths and weaknesses resulting from the reflection that the program has made, separated by locations, daytime or evening schedule and modality when appropriate. The commitment to overcome the weaknesses will be explicit in the Improvement Plan, clearly indicating the locations, daytime or evening schedule and modality in which it applies, when appropriate.

The program will send the Self-Assessment Report to Acredita CI within the period established in the Manual of Rules and Procedures for engineering programs version 4 September 2020, for its incorporation into the accreditation process.

The Self-Assessment Report must not exceed 100 pages in total, not including the annexes indicated.

Finally, those self-assessment reports that are strongly supported by evidence or means of proof (presented in annexes) allow an adequate evaluation of the reality of the programs. It is also important that the self-assessment report is a "road map" that allows the committee of peer reviewers to understand the evidence presented. The program must consider that in order to comply with the evaluation criteria, it must not only demonstrate that it has policies, mechanisms or procedures, but also that it makes use of them, that it reviews the result of their application and that from this review it makes decisions for collective improvement, in a systematic process of continuous improvement of student training. Below is an example of a paragraph that only declares the existence of the mechanisms and later a paragraph that is supported by evidence and demonstrates the application of the mechanisms.

Example of a paragraph of a self-assessment report that only declares the existence of a mechanism, in which it is declared for the aspect “8.f. The academic progression of students towards their degree is a permanent concern of the program, which performs a systematic analysis of the causes of dropout, early detection of retention problems, critical subjects, length of stay, timely graduation and graduation rates. of students, considered by cohorts, venue, day and modality. Defines and applies actions that improve results, safeguarding compliance with the graduation profile and making decisions regarding the results obtained, when necessary”:

 *"The Program Committee is the body destined to the review of student progression (see annex 12 "Regulations of the Program Committee). Information on enrollment, retention, and graduation of students in the major is recorded in the institutional Academic Registration System (SRA). The students surveyed in the self-assessment process declared that they "agree" or "strongly agree" in 63% that the degree has instances to improve the academic progression of the students (see annex 22 student survey). The SRA registers the causes of desertion, although this is only done if the student formally withdraws from the program, which does not happen in most cases where they do not continue with their studies. The SRA shows that the majority of students who withdraw do so for economic reasons (67%), followed by vocational reasons (12%). Second-year retention, on average in the last five years, is 77%, while timely graduation reaches 17% on average in the same period, while total graduation is 34%.*

Example of a paragraph of a self-assessment report supported by evidence and the result of the application of the mechanisms, in which it is declared for the aspect “8.f. The academic progression of students towards their graduation is a permanent concern of the program, which performs a systematic analysis of the causes of dropout, early detection of retention problems, critical subjects, length of stay, timely graduation and graduation rates. of students, considered by cohorts, locations, daytime or evening schedule and modality. Defines and applies actions that improve results, safeguarding compliance with the graduate profile and making decisions regarding the results obtained, when necessary”:

 *"The Program Committee is the body destined to the review of student progression (see annex 12 "Regulations of the Program Committee). Information on enrollment, retention, and graduation of students in the program is recorded in the institutional Academic Registration System (SRA). The Program Committee reviews the progression once each semester (at the beginning), in which the enrollment, retention and graduation indicators are verified (see annex 18 "examples of Program Committee minutes"). The retention results are analyzed with the teachers of the program, (Annex 23 "examples of citations to teachers") depending on the subjects with the lowest results in relation to the goal defined by the Unit, where adjustments are made with the teacher for the purpose of improving student learning. This mechanism has made it possible to improve the performance of students in subject XX in the last four semesters (see annex 24 "examples of adjustments to case work subject XX previous semesters" and the following figure of "retention and approval evolution in the last four semesters"). The students surveyed in the self-assessment process state that 75% "agree" or "strongly agree" that the degree has instances to improve their learning experience (see annex 22 student survey). On the other hand, on average, 12 meetings with students have been held every six months, in the last 3 years, since this mechanism was formalized (see annex 28 "annual management report of the program leadership for the last three years"). The SRA registers the causes of desertion, although this is only done if the student formally withdraws from the program, which does not happen in most cases where they do not continue with their studies. The SRA shows that the majority of students who withdraw do so for economic reasons (67%), followed by vocational reasons (12%). Second-year retention, on average in the last five years, is 77%, while timely graduation reaches 17% on average in the same period, while total graduation is 65%. The analysis of the SRA information is carried out by the Program Committee broken down by cohort, which is confirmed in the minutes of the same Committee (see annex 18 "examples of minutes of the Career Committee).*

**SUMMARY OF BEST PRACTICES FOR ADDRESSING THE SELF-ASSESSMENT PROCESS**

In figure 3 below, it is intended to graph how to approach the best results of the self-assessment process. The self-assessment committee will analyze the DESIGN 2, 3 and 4 criteria on the one hand, and those of RESOURCES 5, 6 and 7 on the other, always keeping in mind that the focus of the process is on demonstrating the results of the training process and its effectiveness, Criterion 8, according to program projections. Continuous improvement sustains the entire training process and the organization and administration establish the context in which the program is developed.

**Figure 3: approach to achieving the results**

Criterio 1:

Organization and administration

Criterion 2:

Educational Objectives

Criterion 3:

Graduate Profile

Criterion 4:

Curriculum

Criterion 5:

Faculty

Criterion 6:

Infrastructure and learning resources

Criterio 7: Connection with de environment

Criterion 8: Results of educational process

Criterion 9: Self regulation and continuous improvement

1.

## FORMAT TO WRITE THE SELF-EVALUATION REPORT

## PROGRAM FILE

|  |
| --- |
| 1. **Unit Data**
 |
| Institution: |  |
| Name of the unit:(School, area, as appropriate) |  |
| Address: |  |
| Name of the highest authority of the unit: |  |
| Position: |  |
| Name of the person in charge of the accreditation process:(For subsequent communications) |  |
| E-mail of the person in charge of the accreditation process: |  |
| Telephone of the person in charge of the accreditation process: |  |
|  |  |
| 1. **Detail of the program (s) to present to the process:**

(Repeat this information as many times as necessary, depending on the program or programs that are presented to the process) |
| Name |  |
| Professional title to which it leads |  |
| Academic program |  |
| Mentions (if appropriate) |  |
|  |
|  |
| Creation Decree No. |  |
| Name of the program according to the Information System for Higher Education (www.mifuturo.cl) |  |
| Does it has previous Accreditation? Yes /No(If the answer is affirmative, indicate the name of the Accreditation Agency and the expiration period of the accreditation) |  |
| Cut-off date of the information presented in the Self-Evaluation Report.(Example: semester XXXX/ year XXXX) |  |
| Related Higher Education Institutions**[[1]](#footnote-1)** |  |

Detail of Locations, Schedules and Modalities[[2]](#footnote-2) in which the program is taught

(Repeat as many times as necessary)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| No. | Location Name | Schedule(Daytime/Evening) | Modality(Face-to-face/Blended/ Remote) | SIES[[3]](#footnote-3) Code | Start year of the Program at the location | Observations |
| 1 |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |
| 3 |  |  |  |  |  |  |
| 4 |  |  |  |  |  |  |
| 5 |  |  |  |  |  |  |
| 6 |  |  |  |  |  |  |
| 7 |  |  |  |  |  |  |
| 8 |  |  |  |  |  |  |

Complete the information indicated, for each location, schedule and modality reported. This information will be referred to through the serial number assigned to each one.

|  |
| --- |
| Detail of the program for each location and modality: |
| 1 | Total number of students enrolled to date: |  |
| Nominal duration of the program expressed in semesters: |  |
| Total number of graduates to date: |  |
| Number of cohorts with graduates to date: |  |
| Indicate the system for measuring student workload: Example: transferable credits / teaching units / credits / other. |  |
| Indicate total credits / units of student workload |  |

## FRAMEWORK

*The program will explain its operation, organization, decision-making structure and academic project. Maximum 3 pages.*

*To this end, reference will be made to institutional definitions; Strategic Plan, Educational Model and other relevant ones, as elements that establish institutional purposes and set the context of the functioning of the Unit and the program.*

2.2.1. **ADVANCES REGARDING THE PREVIOUS ACREDITATION PROCESS** **(where applicable).**

Make explicit the actions taken to overcome weaknesses and the assessment of the impact or effectiveness of these actions. Apply percentages from 0% to 100% where 100% is considered exceeded.

2.2.2. **SUMMARY OF ADJUSTMENTS TO THE STUDY PLAN** **(when a plan with curricular innovation is presented that is taught in parallel with the plan that is being completed).** Summarize the most important changes from one study plan to another, when there is a process of curricular innovation.

|  |
| --- |
| **Example table summarizing adjustments to the curriculum**(Use the table that best represents the adjustments made) |
| **Curriculum that is ending** | **Curriculum innovated** |
| **Institutional educational model (\*)** |  | **Institutional educational model** |  |
| **Educational Objectives** |  | **Educational Objectives** |  |
| **Graduate profile** |   | **Graduate profile** |   |
| **Curriculum** |   | **Curriculum** |   |
| **Subject 1** |   | **Subject 1** |   |
| **Subject 2** |   | **Subject 2** |   |
| **Subject 3** |   | **Subject 3** |   |
| **Subject n** |   | **Subject n** |   |
|  |   |  |   |
|  Other settings |   | Other settings |   |
|   |   |   |   |
|   |   |   |   |

*(\*) Educational model: by objectives / based on competencies / by competencies or similar*

## EVALUATION OF THE QUALITY OF THE EDUCATION OFFERED

### CRITERION 1: ORGANIZATION AND ADMINISTRATION

The unit has an adequate government system and an effective and efficient teaching and administrative management of the resources necessary to fulfill the declared commitments.

1.a. The academic unit has a qualified management body and sufficient dedication to fulfill the established responsibilities, functions and powers**.**

***BOX 1:*** *Detail of the authorities of the Unit and the program, indicating the time dedication to carry out this activity, and their responsibilities, functions and attributions.*

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | ***Position*** | ***Time dedication for the activity*** | ***Responsibilities, functions and attributions*** |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

1.b. The unit plans academic and economic management to achieve the purposes of the program**.**

1.c. The academic unit has administrative, technical and support personnel duly trained, sufficient in number and with time dedication in relation to the day/modality to fulfill their functions and meet the needs of the curriculum**.**

 ***BOX 2:*** *List administrative, technical and support staff, their qualifications for the position they hold.*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***Name*** | ***Position*** | ***Time dedication for the activity*** | ***Qualifications for the position*** | ***Relationship with the number of students in the program*** |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

1.d. The program has at least one manager who supervises the allocation of tasks, the provision of resources, the registration and processing of information for administrative management control. It also summons teachers, support personnel and other instances that attend the program, as established in the curriculum and in accordance with existing regulations and obligations**.**

 ***BOX 3:*** *Indicate the director (s)*

|  |  |  |  |
| --- | --- | --- | --- |
| ***Name*** | ***Position*** | ***Time dedication for the activity*** | ***Responsibilities, functions, and attributions*** |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

1.e. The program has systematic academic guidance mechanisms for students while studying the curriculum and demonstrates the effectiveness of their application**.**

1.f. The program is organized to grant the necessary facilities to carry out professional practices, terrain outputs, qualification and thesis work or any other activity contemplated in the curriculum**.**

1.g. The program has effective instances of communication and participation of teachers. The program demonstrates that these instances facilitate coordination with the authorities of the program regarding the subjects of teaching functions**.**

1.h. The Academic Unit has information and administrative management systems appropriate to the management and communication needs in the program.

1.i. The institution has committed financial resources that guarantee the sustainability of the program and ensure the projected permanence of students over time. As a result, the academic unit has sufficient financial resources and an updated and founded annual budget, which allows it to maintain adequate conditions for the operation of the program, with effective budget control mechanisms.

*Attach the evidence that supports the statement in this Criterion, in a directory or folder called* ***Criterion 1.***

a. *Evaluates the Criterion:*

*•* ***Meet:*** *there is evidence that policies and mechanisms are known and applied systematically, showing results that are periodically reviewed.*

*•* ***Does not meet - in development****: there is evidence that the policies and mechanisms are known and applied, with preliminary results, but there is no evidence yet that it is systematic.*

*•* ***Does not meet - inexistent:*** *the program has defects in its design or does not have formal or systematic policies or mechanisms in its educational process, or there are only statements, but without evidence of its application.*

*b. Give your opinion on compliance with the criterion. Justify your answer.*

### CRITERION 2: EDUCACIONAL OBJECTIVES

The program has a clear definition of its educational objectives, which respond to the institutional mission.

2.a. The program declares its educational objectives and the occupational field formally and expresses them clearly**.**

2.b. The educational objectives of the program are consistent with the institutional mission**.**

*Definition*

*Educational Objectives: statement on the aspiration of the professional to be trained and that is verified after at least two years of professional practice. It is synonymous with professional profile.*

*Attach the evidence that supports the statement in this Criterion, in a directory or folder called* ***Criterion 2.***

a. *Evaluates the Criterion:*

*•* ***Meet:*** *there is evidence that policies and mechanisms are known and applied systematically, showing results that are periodically reviewed.*

*•* ***Does not meet - in development****: there is evidence that the policies and mechanisms are known and applied, with preliminary results, but there is no evidence yet that it is systematic.*

*•* ***Does not meet - inexistent:*** *the program has defects in its design or does not have formal or systematic policies or mechanisms in its educational process, or there are only statements, but without evidence of its application..*

*b. Give your opinion on compliance with the criterion. Justify your answer.*

### CRITERION 3: GRADUATE PROFILE

The program has an updated graduate profile required for professional performance, which responds to educational objectives and includes the graduate attributes. It is known by students and the academic community in general and is disseminated to the external environment relevant to the program.

3.a. The graduate profile is formalized and expressed clearly. If there are mentions, these are described in the graduate profile**.**

3.b. The graduate profile has been defined according to the institutional purposes, the educational model and the educational objectives of the program**.**

3.c. The graduate profile is consistent with the title delivered and the educational level of the program**.**

3.d. The graduate profile considers the following graduate attributes**.**

*The competencies of the graduate profile indicated below are declared in a generic way and are applicable to science-based engineering. Each statement can be extended and given a particular emphasis on a specific disciplinary context through an own graduate profile that considers the institutional educational model and the specialty, but this statement must not be altered in its essence or omit its individual elements.*

The graduate attributes that will be required in the accreditation processes from 2024 are presented below. The programs may choose to work with these attributes for their accreditation processes of the year 2023, if they define it.

|  |  |
| --- | --- |
| **Graduate Attributes** | **Engineer Graduate** |
| **Engineering Knowledge:**  | **1:** Apply knowledge of mathematics, natural science, computing and engineering fundamentals, and an engineering specialization as specified in Knowledge Profile 1 to 4 respectively to develop solutions to complex engineering problems |
| **Problem Analysis**  | **2:** Identify, formulate, research literature and analyze *complex* engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences with holistic considerations for sustainable development\* (Knowledge profile 1 to 4) |
| **Design/developm ent of solutions:**  | **3:** Design creative solutions for *complex* engineering problems and design systems, components or processes to meet identified needs with appropriate consideration for public health and safety, whole-life cost, net zero carbon as well as resource, cultural, societal, and environmental considerations as required (Knowledge profile 5) |
| **Investigation:**  | **4:** Conduct investigations of *complex* engineering problems using research methods including research- based knowledge, design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions (Knowledge profile 8) |
| **Tool Usage:**  | **5:** Create, select and apply, and recognize limitations of appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to *complex* engineering problems (Knowledge profile 2 and 6) |
| **The Engineer and the World:**  | **6:** When solving complex engineering problems, analyze and evaluate sustainable development impacts\* to: society, the economy, sustainability, health and safety, legal frameworks, and the environment (Knowledge profile 1, 5, and 7) |
| **Ethics:**  | **7:** Apply ethical principles and commit to professional ethics and norms of engineering practice and adhere to relevant national and international laws. Demonstrate an understanding of the need for diversity and inclusion (Knowledge profile 9) |
| **Individual and Collaborative Team work:** | **8:** Function effectively as an individual, and as a member or leader in diverse and inclusive teams and in multi-disciplinary, face-to-face, remote and distributed settings (Knowledge profile 9) |
| **Communication:**  | **9:** Communicate effectively and inclusively on *complex* engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, taking into account cultural, language, and learning differences (Knowledge profile 9) |
| **Project Management and Finance:** | **10:** Apply knowledge and understanding of engineering management principles and economic decision-making and apply these to one’s own work, as a member and leader in a team, and to manage projects and in multidisciplinary environments. |
| **Lifelong learning:**  | **11:** Recognize the need for, and have the preparation and ability for i) independent and life-long learning ii) adaptability to new and emerging technologies and iii) critical thinking in the broadest context of technological change (Knowledge profile 8) |

\*Represented by the 17 UN Sustainable Development Goals (UN-SDG)

3.e. The graduate profile is known by the students and academic community in general and disseminated to the external environment relevant to the program**.**

*Attach the evidence that supports the statement in this Criterion, in a directory or folder called* ***Criterion 3.***

a. *Evaluates the Criterion:*

*•* ***Meet:*** *there is evidence that policies and mechanisms are known and applied systematically, showing results that are periodically reviewed.*

*•* ***Does not meet - in development****: there is evidence that the policies and mechanisms are known and applied, with preliminary results, but there is no evidence yet that it is systematic.*

*•* ***Does not meet - inexistent:*** *the program has defects in its design or does not have formal or systematic policies or mechanisms in its educational process, or there are only statements, but without evidence of its application..*

*b. Give your opinion on compliance with the criterion. Justify your answer.*

### CRITERION 4: CURRICULUM

The design of the curriculum is consistent with the educational model and knowledge profile of a science-based engineering program. The program demonstrates that the curriculum is oriented to the achievement of the graduate profile and attributes.

4.a. The program structures its curriculum, subject programs and curricular activities according to the graduate profile and the educational model**.**

4.b. The program establishes learning outcomes in each subject so that students achieve the competencies of the graduate profile, including the attributes of the graduate. Learning outcomes can also be established at cycle level or training levels to demonstrate the achievement of competences**.**

|  |  |  |
| --- | --- | --- |
| **Graduate Atributes** | **Examples of subjects that are taxed according to Table 2** | Comments on learning outcomes versus contents versus evaluation strategies, according to subject design |
| Engineering Knowledge: 1: Apply knowledge of mathematics, natural science, computing and engineering fundamentals, and an engineering specialization to develop solutions to complex engineering problems |  |  |
| Problem Analysis 2: Identify, formulate, research literature and analyze *complex* engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences with holistic considerations for sustainable development. |  |  |
| Design/development of solutions: 3: Design creative solutions for *complex* engineering problems and design systems, components or processes to meet identified needs with appropriate consideration for public health and safety, whole-life cost, net zero carbon as well as resource, cultural, societal, and environmental considerations as required. |  |  |
| Investigation:4: Conduct investigations of *complex* engineering problems using research methods including research- based knowledge, design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions. |  |  |
| Tool Usage: 5: Create, select and apply, and recognize limitations of appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to *complex* engineering problems. |  |  |
| The Engineer and the World: 6: When solving complex engineering problems, analyze and evaluate sustainable development impacts\* to: society, the economy, sustainability, health and safety, legal frameworks, and the environment. |  |  |
| Ethics: 7: Apply ethical principles and commit to professional ethics and norms of engineering practice and adhere to relevant national and international laws. Demonstrate an understanding of the need for diversity and inclusion. |  |  |
| Individual and Collaborative Team work:8: Function effectively as an individual, and as a member or leader in diverse and inclusive teams and in multi-disciplinary, face-to-face, remote and distributed settings  |  |  |
| Communication: 9: Communicate effectively and inclusively on *complex* engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, taking into account cultural, language, and learning differences |  |  |
| Project Management and Finance:10: Apply knowledge and understanding of engineering management principles and economic decision-making and apply these to one’s own work, as a member and leader in a team, and to manage projects and in multidisciplinary environments. |  |  |
| Lifelong learning: 11: Recognize the need for, and have the preparation and ability for i) independent and life-long learning ii) adaptability to new and emerging technologies and iii) critical thinking in the broadest context of technological change. |  |  |

4.c. The program demonstrates that the curriculum includes at least the following knowledge and attitude**.**

**Knowledge Profile:**

|  |
| --- |
| **The curriculum for a science-based engineering program** provides: |
| **1:** a systematic, theory-based understanding of the **natural sciences** as well as **social science topics** applicable to the discipline. |
| **2:** conceptually-based **mathematics**, numerical analysis, data analysis, statistics and formal aspects of computer and information science to support detailed analysis and modelling applicable to the discipline. |
| **3:** a systematic, theory-based formulation of **engineering fundamentals** required in the engineering discipline |
| **4:** engineering **specialist knowledge** that provides theoretical frameworks and bodies of knowledge for the accepted practice areas in the engineering discipline; much is at the forefront of the discipline. |
| **5:** knowledge that supports **engineering design and operations** using the technologies of the discipline's engineering practice area. This includes, for example, the efficient use of resources, environmental impacts, life cycle cost, reuse of resources, net zero carbon and similar concepts. |
|  **6:** knowledge of **engineering practice** (technology) in the practice areas in the engineering discipline.  Recognize the efficient use of technologies as decision-making tools and the optimization of  processes in different areas. |
| **7:** knowledge ofthe **role of engineering in society** and identified issues in engineering practice in the discipline, such as the professional responsibility of an engineer to public safety and sustainable development\*. |
| **8:** engagement with selected knowledge in the current **research literature** of the discipline, awareness of the power of critical thinking and creative approaches to evaluate emerging issues |
| **9: ethics, inclusive behavior and conduct, communication, team and collaborative work.** Knowledge of the ethics, responsibilities, and professional standards of engineering practice. Development of inclusive attitudes and understanding of diversity resulting from ethnicity, gender, age, physical ability, etc., considering mutual respect and developing effectively as an individual and as a member or leader in diverse teams. Communicates and collaborates using multiple means of communication in a clear and inclusive manner with the engineering community, with multidisciplinary teams and with the target audience during all its activities. Understands, writes, and presents topics relevant to their field of action before a variety of audiences. |

 \*Represented by the 17 UN Sustainable Development Goals (UN-SDG)

4.d. The curriculum considers theoretical and practical activities in an integrated manner**.**

4.e. The curriculum considers professional practices consistent with the graduate profile. The program provides guidance on places of practice to students. Guidance mechanisms can be varied, such as agreements or alliances, among others**.**

4.f. The curriculum and curricular activities are formally and systematically made known to students, who have access to the syllabuses of the subjects**.**

4.g. The actual academic work of the students is quantified in comparable units (credits or chronological hours), according to a reasoned and proportional standard. It is suggested to adhere to the Transferable Credit System (SCT-Chile)**.**

4.h. For the title process, the program has defined one or more activities, according to the graduate profile. These activities are part of the curriculum and are considered within the declared duration of the program**.**

*Attach the evidence that supports the statement in this Criterion, in a directory or folder called* ***Criterion 4.***

a. *Evaluates the Criterion:*

*•* ***Meet:*** *there is evidence that policies and mechanisms are known and applied systematically, showing results that are periodically reviewed.*

*•* ***Does not meet - in development****: there is evidence that the policies and mechanisms are known and applied, with preliminary results, but there is no evidence yet that it is systematic.*

*•* ***Does not meet - inexistent:*** *the program has defects in its design or does not have formal or systematic policies or mechanisms in its educational process, or there are only statements, but without evidence of its application..*

*b. Give your opinion on compliance with the criterion. Justify your answer.*

### CRITERION 5: FACULTY

The program has a sufficient and suitable teaching staff to comply with the activities and learnings committed in the curriculum, which allows its students to systematically advance towards the achievement of the graduate profile and attributes.

5.a. The endowment, permanence and dedication of the teaching staff guarantees the implementation of the curriculum, direct teaching and the activities of the teaching-learning process (evaluations, practical work, preparation of tasks and exercises, use of information and communication technologies), as well as the attention and guidance of students outside the classroom**.**

***BOX 4****: Complete the box indicating the number of teachers in the program for the last semester of the evaluation period:*

*Dedication*

 *1: Up to 10 hours a week*

*2: From 11 to 21 hours a week*

*3: From 22 a 43 hours a week*

|  |
| --- |
| ***Indicate: last semester of the evaluation period*** |
| ***HIGHEST ACADEMIC GRADE*** | ***DEDICATION TEACHERS /ACADEMICS*** | ***TOTAL*** |
| ***FULL TIME*** | ***PART TIME*** |  |
| ***1*** | ***2*** | ***3*** | ***SUBTOTAL*** |
| *PhD* |  |  |  |  |  |  |
| *MSc* |  |  |  |  |  |  |
| *Lic* |  |  |  |  |  |  |
| *Professional title* |  |  |  |  |  |  |
| *TOTAL* |  |  |  |  |  |  |

*Detail in Box 2 below the teachers of the program indicated in Box 1. Box 2 may be incorporated as an Annex to the Report if it deems necessary:*

***BOX 5:*** *Detail of teachers / academics of the program at the end of the last academic year reported in this self-evaluation process.*

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | ***Name*** | ***Professional Title*** | ***Highest Academic Grade*** | ***Year of start of activities in the program*** | ***Faculty Hierarchy*** | ***Hired time dedication*** | ***Tipe******of contract*** | ***Unit to which******belongs*** | ***Subject taught*** |
| 1 |  |  |  |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |  |  |  |
| n |  |  |  |  |  |  |  |  |  |

5.b. The program has qualified and competent teachers for the achievement of the objectives or learning results of the curriculum and the graduate profile. The qualification and competence of the teaching staff considers the academic and pedagogical training, as well as the trajectory in the scientific, professional or technical field**.**

5.c. The program has a body of stable teachers that gives sustainability over time to the educational project of the program, in all its locations, conferences and modalities**.**

|  |
| --- |
| 5.d. Known systematic rules and mechanisms for the selection, recruitment and disengagement of teachers apply**.** |

5.e. Systematic policies and mechanisms are applied for the updating and improvement of program teachers in pedagogical aspects of the institutional educational model**.**

***BOX 6:*** *Detail of faculty members of the program at the end of the last academic year reported in this self-evaluation process, who have received improvement in disciplinary and professional aspects in the last five years.*

|  |  |  |  |
| --- | --- | --- | --- |
| ***No.*** | ***Name of the faculty member*** | ***Improvement activity*** | ***Participation date*** |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

5.f. Systematic policies and mechanisms are applied for the updating and improvement of the teachers of the program in disciplinary aspects ensuring a permanent improvement of their qualifications and competences, according to the institutional purposes**.**

***BOX 7:*** *Detail of faculty members of the program at the end of the last academic year reported in this self-evaluation process, who have received improvement in pedagogical aspects in the last five years.*

|  |  |  |  |
| --- | --- | --- | --- |
| ***No.*** | ***Name of the faculty member*** | ***Improvement activity*** | ***Participation date*** |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

5.g. Systematic mechanisms are applied for the evaluation of the activity of teaching staff, in particular their role in achieving learning outcomes. These mechanisms consider the opinion of students and program authorities. The results of the evaluation are used to improve their performance, where appropriate**.**

*Attach the evidence that supports the statement in this Criterion, in a directory or folder called* ***Criterion 5.***

a. *Evaluates the Criterion:*

*•* ***Meet:*** *there is evidence that policies and mechanisms are known and applied systematically, showing results that are periodically reviewed.*

*•* ***Does not meet - in development****: there is evidence that the policies and mechanisms are known and applied, with preliminary results, but there is no evidence yet that it is systematic.*

*•* ***Does not meet - inexistent:*** *the program has defects in its design or does not have formal or systematic policies or mechanisms in its educational process, or there are only statements, but without evidence of its application..*

*b. Give your opinion on compliance with the criterion. Justify your answer.*

### CRITERION 6: INFRASTRUCTURE AND LEARNING RESOURCES

The program has the infrastructure, resources for learning and equipment required for students to achieve learning outcomes. Mechanisms are also in place for the development, replacement, maintenance and security of such facilities and resources.

6.a. The program uses infrastructure, such as classrooms, laboratories, places of study, among others, for the teaching-learning process consistent with the graduate profile, sufficient and functional to the needs of the curriculum, the number of students, locations, daytime or evening and modalities**.**

|  |
| --- |
| 6.b. The program uses technological, computational and support resources to the teaching-learning process that agree with the graduation profile and the curriculum and available to students according to locations, daytime or evening and modalities**.** |

6.c. The library has collections, facilities, equipment, personnel specialized in librarianship, access to networks and technical processes consistent with the graduation profile and the curriculum and available to students according to the locations, daytime or evening and modalities**.**

6.d. There are the necessary financial resources to continuously meet the needs of provision, replacement, maintenance and updating of infrastructure, equipment and resources for teaching**.**

6.e. There is an appropriate balance between the number of students in each course and the total resources available.

6.f.  It has universal accessibility and security protocols that are rigorously applied in all enclosures.

*Attach the evidence that supports the statement in this Criterion, in a directory or folder called* ***Criterion 6.***

a. *Evaluates the Criterion:*

*•* ***Meet:*** *there is evidence that policies and mechanisms are known and applied systematically, showing results that are periodically reviewed.*

*•* ***Does not meet - in development****: there is evidence that the policies and mechanisms are known and applied, with preliminary results, but there is no evidence yet that it is systematic.*

*•* ***Does not meet - inexistent:*** *the program has defects in its design or does not have formal or systematic policies or mechanisms in its educational process, or there are only statements, but without evidence of its application..*

*b. Give your opinion on compliance with the criterion. Justify your answer.*

CRITERION 7: CONNECTION WITH THE ENVIRONMENT

The program maintains a systematic interaction with its significant environment, in accordance with the policy of linking with the environment of the institution, as well as with the purposes of the academic unit. Mechanisms for evaluating the results of activities related to the environment are applied periodically, in accordance with the purposes of the institution and the unit.

7.a. The program plans the activities, has resources for their realization and applies mechanisms to evaluate their result. The link with the environment responds to the institutional policy in the matter, as well as to the purposes of the academic unit**.**

7.b. The activities of connection with the environment make known the professional environment to the student**.**

7.c. The unit and the program systematically evaluate the result of the contribution of the activities of connection with the environment to the formative process, in accordance with the institutional policy and the purposes of the academic unit. The result of the evaluation is used for the continuous improvement of the activities**.**

*Attach the evidence that supports the statement in this Criterion, in a directory or folder called* ***Criterion 7.***

a. *Evaluates the Criterion:*

*•* ***Meet:*** *there is evidence that policies and mechanisms are known and applied systematically, showing results that are periodically reviewed.*

*•* ***Does not meet - in development****: there is evidence that the policies and mechanisms are known and applied, with preliminary results, but there is no evidence yet that it is systematic.*

*•* ***Does not meet - inexistent:*** *the program has defects in its design or does not have formal or systematic policies or mechanisms in its educational process, or there are only statements, but without evidence of its application..*

*b. Give your opinion on compliance with the criterion. Justify your answer.*

### CRITERION 8: RESULTS OF THE EDUCATIONAL PROCESS

The program has policies and mechanisms aimed at supporting the teaching-learning process, monitoring the consistency of evaluation instruments and verifying the academic progression towards the title. The results of policies and mechanisms are periodically evaluated and corrective measures are applied where appropriate, in accordance with existing self-regulatory mechanisms. The program presents substantive evidence of compliance with the graduate profile, as well as educational objectives.

8.a. The program has explicit and publicly known regulations and admission mechanisms. These standards are applied systematically in admission and are consistent with the requirements of the curriculum. The program explains its special admission system where applicable**.**

8.b. The program takes into account the conditions of entry of students with respect to the requirements of the curriculum and provides resources and activities for leveling, whenever required**.**

8.c. The program has articulated policies and mechanisms to:

i. Strengthen study habits and techniques of its students.

ii. Intervene with support strategies, for the improvement of student outcomes, when appropriate.

iii. Disassociate students from the program when appropriate, in accordance with current regulations.

8.d. The program, with the participation of teachers, ensures and demonstrates that pedagogical strategies are adequate to produce student learning and that evaluation instruments allow to verify that this learning is achieved, which in turn ensures that the competencies of the graduate profile and the graduate attributes are achieved. The mechanisms used consider the opinion of students on these assessment instruments. According to the results, the program applies corrective measures that lead to the continuous improvement of learning**.**

|  |  |  |  |
| --- | --- | --- | --- |
| Graduate attributes | For graduates of a science-based engineering degree | Subject(s) that measure (M) the attributes of the graduate according to Table 2, from Annexes Mandatory Tables | Explain how you measure the elements of each graduate attribute. |
| Engineering Knowledge:  | 1: Apply knowledge of mathematics, natural science, computing and engineering fundamentals, and an engineering specialization to develop solutions to complex engineering problems |  |  |
| Problem Analysis  | 2: Identify, formulate, research literature and analyze *complex* engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences with holistic considerations for sustainable development. |  |  |
| Design/development of solutions:  | 3: Design creative solutions for *complex* engineering problems and design systems, components or processes to meet identified needs with appropriate consideration for public health and safety, whole-life cost, net zero carbon as well as resource, cultural, societal, and environmental considerations as required. |  |  |
| Investigation:  | 4: Conduct investigations of *complex* engineering problems using research methods including research- based knowledge, design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions. |  |  |
| Tool Usage:  | 5: Create, select and apply, and recognize limitations of appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to *complex* engineering problems. |  |  |
| The Engineer and the World:  | 6: When solving complex engineering problems, analyze and evaluate sustainable development impacts\* to: society, the economy, sustainability, health and safety, legal frameworks, and the environment. |  |  |
| Ethics:  | 7: Apply ethical principles and commit to professional ethics and norms of engineering practice and adhere to relevant national and international laws. Demonstrate an understanding of the need for diversity and inclusion. |  |  |
| Individual and Collaborative Team work: | 8: Function effectively as an individual, and as a member or leader in diverse and inclusive teams and in multi-disciplinary, face-to-face, remote and distributed settings  |  |  |
| Communication:  | 9: Communicate effectively and inclusively on *complex* engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, taking into account cultural, language, and learning differences |  |  |
| Project Management and Finance: | 10: Apply knowledge and understanding of engineering management principles and economic decision-making and apply these to one’s own work, as a member and leader in a team, and to manage projects and in multidisciplinary environments. |  |  |
| Lifelong learning:  | 11: Recognize the need for, and have the preparation and ability for i) independent and life-long learning ii) adaptability to new and emerging technologies and iii) critical thinking in the broadest context of technological change. |  |  |

8.e. In the title process students demonstrate their ability to design solutions to complex engineering problems in accordance with the graduation profile, which includes the attributes of the graduate.

A complex engineering problem is one that cannot be solved without a thorough knowledge of engineering that considers the theory, the fundamentals of engineering necessary in the discipline, specialized knowledge at the forefront of the discipline and involving one or more of the following characteristics:

1. Matters of great technical or non-technical scope such as ethical, sustainability, legal, political, economic and social and the consideration of future requirements.
2. They have no obvious solution and require abstract thinking, creativity and originality in analysis to formulate appropriate models.
3. Involve rare situations or novel problems.
4. Address problems that are not covered by the standards and codes of professional engineering practice.
5. They involve collaboration between engineering disciplines, other fields, and/or diverse interest groups with a wide variety of needs.

These are high-level problems that include many components or sub-problems that may require a systemic approach.

8.f. The academic progression of students towards their curriculum is a permanent concern of the program, which carries out a systematic analysis of the causes of desertion, early detection of retention problems, critical subjects, time of permanence, timely qualification, and degree rates of students, considered by cohorts, locations, daytime or evening and modalities. Defines and applies actions that improve results, safeguarding compliance with the graduation profile and making decisions regarding the results obtained, when necessary**.**

8.g. The program has a record of the academic performance of its students, who have access to information on their curricular progress**.**

8.h. The program systematically applies mechanisms to know the occupation rates, the type of employment and the characteristics of the professional performance of its graduates. The program compares this information with the educational objectives to verify the achievement of these. This information is used to improve the training process, where appropriate**.**

*Attach the evidence that supports the statement in this Criterion, in a directory or folder called* ***Criterion 8.***

a. *Evaluates the Criterion:*

*•* ***Meet:*** *there is evidence that policies and mechanisms are known and applied systematically, showing results that are periodically reviewed.*

*•* ***Does not meet - in development****: there is evidence that the policies and mechanisms are known and applied, with preliminary results, but there is no evidence yet that it is systematic.*

*•* ***Does not meet - inexistent:*** *the program has defects in its design or does not have formal or systematic policies or mechanisms in its educational process, or there are only statements, but without evidence of its application..*

*b. Give your opinion on compliance with the criterion. Justify your answer.*

### CRITERION 9: SELF-REGULATION AND CONTINUOUS IMPROVEMENT

The program has mechanisms of self-regulation and continuous improvement; to do this, it uses the available information, from the diagnoses made, to design and implement actions to improve its training process. In addition, the program presents evidence of the commitment of the estates and people with the culture of quality, demonstrating that it implements the actions committed in its improvement plans.

9.a. The program has a quality assurance system for its training process that promotes the strengthening of the capacity for self-regulation and its continuous improvement**.**

9.b. The program reviews and keeps updated the educational objectives through consultation with graduates and employers, of all its locations, daytime or evening and modalities. The review is periodic and also considers the institutional mission**.**

9.c. The program reviews and keeps updated the graduate profile through consultation with sources and internal and external stakeholders, including graduates and employers, of all its locations, daytime or evening and modalities, ensuring consistency with the educational objectives. The review is periodic, considers the institutional educational model and is carried out within a maximum period of time than the formal duration of the curriculum**.**

9.d. The program reviews and keeps updated the curriculum through consultation with sources and internal and external stakeholders, including graduates and employers, of all its locations, daytime or evening and modalities, ensuring consistency with the graduate profile. The review is periodic and systematic, considers the institutional educational model and is carried out on a permanent basis**.**

9.e. The self-evaluation process was participatory and the conclusions have been elaborated considering the opinion of teachers, students, graduates and employers, with a wide level of participation.

9.f. In the self-evaluation report, the program has identified its weaknesses, if any, in accordance with the evaluation criteria and has committed improvement actions to correct them. The improvement plan has the support of the institutional authorities for its realization.

9.g. The program demonstrates that it has implemented the actions committed in its improvement plans and that it has evaluated its achievement periodically, as evidence of the culture of internal quality present in the program

*Attach the evidence that supports the statement in this Criterion, in a directory or folder called* ***Criterion 9.***

a. *Evaluates the Criterion:*

*•* ***Meet:*** *there is evidence that policies and mechanisms are known and applied systematically, showing results that are periodically reviewed.*

*•* ***Does not meet - in development****: there is evidence that the policies and mechanisms are known and applied, with preliminary results, but there is no evidence yet that it is systematic.*

*•* ***Does not meet - inexistent:*** *the program has defects in its design or does not have formal or systematic policies or mechanisms in its educational process, or there are only statements, but without evidence of its application.*

*b. Give your opinion on compliance with the criterion. Justify your answer.*

* 1.
	2.

## PROGRAM WEAKNESSES

The program will establish its weaknesses based on the analysis on the fulfillment of the criteria that it carried out previously. The weaknesses must be clear and refer directly to the lack of compliance with the evaluation criteria. Weaknesses should reflect the causes of non-compliance.

Examples of well-identified weaknesses:

• The program has not established a systematic mechanism for verifying learning outcomes.

• The program has not implemented actions aimed at improving the graduation rate.

• There is no feedback process from the graduates about their professional performance.

• Communication proficiency in English is highly dependent on electives, so students may not achieve it by taking others.

• The specialty laboratory does not have security protocols that allow teachers or students to face an emergency.

Examples of misidentified weaknesses:

• The dissemination of the graduation profile should be improved.

• Although activities are developed to connect with the environment, these must be improved.

• Students do not know if teachers have access to advanced teaching courses.

## PROGRAM STRENGTHS

The program will establish your strengths, which are distinctive traits. Strengths are not meeting criteria or aspects to consider. The strengths do not influence the accreditation decision, since their existence is not an indicator of compliance with the evaluation criteria, however it will always be positive to indicate them because they are a reflection of the effort and work that is carried out in the program.

Examples of well-identified strengths:

• Highlights the high content of practical activities where students propose solutions to complex engineering problems, real and typical of the profession and discipline.

• Employers verify that graduates are innovative and autonomous in the decisions they make.

Examples of misidentified strengths:

• The program has an updated graduation profile that is consistent with the institutional educational model.

• The graduation standards are clear and are known to the students.

• The graduation rate improved from 35% to 41%.

## CONCLUSIONS AND IMPROVEMENT PLAN

***Corrective actions and measures applied during the process***: explain the improvement actions or mechanisms that were incorporated during the self-evaluation process. The objective at this stage is to show the ability of the program to introduce changes and adapt to them.

***Necessary conditions for the application of the actions, planned measures or mechanisms to be established****:* explain the real possibilities that exist to incorporate the changes projected in the Improvement Plan, otherwise, explain what will be done to do so.

***Improvement Plan****:* The Improvement Plan is understood as a document that formalizes the actions that the program undertakes to develop to resolve the weaknesses detected in its self-evaluation process. It is a guide to the continuous improvement process. This plan establishes duly prioritized actions, reflected through activities, indicating:

• Weakness to overcome

• Actions to implement

• Responsible for guiding each of these actions

• Deadlines for achievement (start and end)

• Goals

• Monitoring indicators

• Resources that the actions will involve (human and economic)

The Improvement Plan must be realistic: the committed actions can be specified and verifiable. The monitoring indicators and goals allow to control the progress in the implementation of these actions. In addition, the person responsible for its achievement must be a visible, explicit person (or group of people). This planning must be consistent with the development plan of the program or the unit in which it is inserted.

**Template for improvement plan**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Weakness to overcome | Actions to implement | Responsible for guiding each of these actions | Deadlines for achievement (start and end) | Goals | Monitoring indicators | Resources that the actions will involve (human and economic) |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

The resources involved in the Improvement Plan must be explicitly endorsed and committed by the institution.

## FINAL EVALUATION (One page maximum)

Incorporate a final conclusion that synthesizes the vision of the program on the self-assessment process carried out and its results.

Indicate, when appropriate, what is your opinion about your ability to overcome the weaknesses of the previous accreditation process.

## ANNEX 1: Mandatory annexes

|  |  |
| --- | --- |
| 1  | Institutional educational project. |
| 2  | Institutional strategic planning. |
| 3  | Institutional, unit or program regulations, which refer to:Rights and Duties of students regarding: planned academic load, grades, rules regarding admission, inclusion, promotion, permanence and graduation, performance of professional practices, procedures and provisions for approval, validation of previous studies, student behavior, among others . |
| 4  | Institutional regulations, of the unit or the program, that regulate the actions of the faculty, technical and administrative personnel. |
| 5  | Current regulations governing the program |
| 6  | Resolution to create the program. |
| 7  | Graduation regulation. |
| 8 | Regulations associated with the selection, hiring, evaluation, promotion and dismissal of faculty. Include here the Hierarchical Regulation. |
| 9  | Regulations associated with the evaluation of the activity of the faculty of the program |
| 10 | Regulation of regular admission. |
| 11  | Regulation of special admission. |
| 12  | Institutional quality assurance policies. |
| 13 | Connection with the environment plan.  |
| 14  | Protocols and documents of universal accessibility to the enclosures and spaces of the program. |
| 15 | Budgetary instructions, investment plan, institutional policies for the use of resources.  |
| 16 | Annual budget of the program, for the last 5 years. |
| 17 | Improvement Plan and Investment Plan associated with the program of the last 2 self-evaluation processes, if applicable. Include compliance evaluation. |
| 18 | Curriculum, which incorporates at least:Areas, prerequisites, credit per subject, credits per semester, intermediate exits and professional practice requirements, graduation requirements.If the program has two current study plans, one finishing and one product of a curricular innovation, present the curricula of both plans. |
| 19  | Subject programs If the program has two current study plans, one finishing and one product of a curricular innovation, present the curricula of both plans. |
| 20 | CV of faculty of the program, for the last semester at the end of the self-evaluation process. The format of this CV must explicitly present the knowledge and trajectory of the teacher and their areas of expertise. |
| 21  | History of accreditation agreements, when applicable. |
| 22  | Dissemination material used in the last 5 admission processes. |

## TABLE 1: Matrix of contribution of the subjects to the graduate profile and graduate atributes

##

* Indicate each of the competences in the graduation profile, include all competences, whether generic or specific. Do not use acronyms, indicate each competence in full.
* In the "subject" boxes, include all the activities of the curriculum: subjects themselves; mandatory internships or work practices; Cycle evaluations, if applicable (for example, “Work Practice 1”; “Exam for Bachelor of Engineering Science”, etc.). It is a requirement to indicate the name of the professor who dictated it in the last year of closing the self-evaluation process.
* Check the box where a competence intersects with the curriculum subject or activity that contributes to the achievement of that competence.
* In the column "graduate attributes" identify, for each competence, with which attribute (s) it correlates (eg: competence 1 correlates attributes 1 and 3).
* The example uses SCT credit only as a reference. Indicate the system of credits or estimation of the academic load of the students that is effectively used by the program.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Graduate profile competences | Semester in which the subject is taught | Semester in which the subject is taught | Semester in which the subject is taught | Graduate Attributes  |
| Subject 1(Teacher's name) | Subject 2(Teacher's name) | Subject N(Teacher's name) |
| Total credits of the subject | Total credits of the subject | Total credits of the subject |
| Educational area to which the subject belongs | Educational area to which the subject belongs | Educational area to which the subject belongs |
| Competence 1 |  |  |  |  |
| Competence 2 |  |  |  |  |
| Competence N |  |  |  |  |

**Example of filling a table**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Graduate profile competences | *1st semester* | *3rd semester* | *9th semester* | Graduate Attributes |
| *Introduction to Engineering (Liliana Zúñiga)* | *Oral and written language (Roberto Pinto)* | *Capstone Project (Carlos Pérez)* |
| *6 SCT* | *3 SCT* | *10 SCT* |
| *Basic Education* | *Transversal education* | *Professional cycle* |
| *C1: Learn about the role of the profession in society and the scope of its impacts.* | *x* |  | *x* | *1: Engineering knowledge**3: Design / development of solutions* |
| *C2: Write reports and other documents clearly.* |  | *x* |  | *9: Communication* |
| *C3: Design complex systems* |  |  | *x* | *3: Design / development of solutions* |
| *C4: He/she joins work teams of his/her own profession or multidisciplinary and is capable of exercising leadership.* | *x* |  | *x* | *8: Individual and collaborative team work* |

## TABLE 2: correspondence between graduate attributes and learning outcomes of each subject.

##

Detail the contribution of the learning outcomes of each subject and/or activity of the curriculum, to the graduate attributes, following the example presented below.

C: contributes - activities conducive to the development of the attribute are carried out.

 I: Incorporating – the attribute has recently been incorporated into the curriculum.

M: measure – in the subject the attribute is specifically measured in student learning.

Example:

|  |  |
| --- | --- |
|  |  |
| **GRADUATE ATTRIBUTES** |
|    | **Curriculum** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** |
| Semester 1 |   |   |   |   |   |   |   |   |   |   |   |   |
|   | Subject 1 | C |   |   |   |   |   |   |   |   |   |   |
|   | Subject 2 |   | C |   |   |   |   |   |   |   |   |   |
|   | Subject 3 |   C |   |   |   |   | C |   |   |   |   C |   |
|   | Subject 4 |   |   |   |   |   | C |   |   |   |   |   |
|   | Subject 5 |   |   |   |   | C |   |   |   |   |   |   |
| Semester 8 |   |   |   |   |   |   |   |   |   |   |   |   |
|   | Subject 36 | C |   |   |   |   |   |   |   |   |   |   |
|   | Subject 37 |   | C |   |   |   |   |   | I |   |   |   |
|   | Subject 38 |   | C  | C |   | C | C |   |   |   |   |   |
|   | Subject 39 |   |   C | C |   |   |   |   |   | C | C | C |
|   | Subject 40 |   |   |   | I |   |   |   |   | C | C | C |
| Activity | Practice activity semester 8 |  | M |  |  |  |  |  |  | M |  | M |
| Semester n |   |   |   |   |   |   |   |   |   |   |   |   |
|   | Subject x | M |   | C |   |   |   |   |  |   |   |   |
|   | Subject y |   |   |   | I | C |   |   |  |   |  |   |
|   | Subject z |   |   |   |   |   |   |   | I | C |  |   |
|   | Subject x1 |   |   |   |   |   | C | C |  |   |   |   |
|   | Subject x2 |   |   |  | I | C |  |  |  |  |  |   |
| Final activity | Final project –capstone- other |   |   | M |  | M | M | M |  |  | M |  |

Explicitly identify those subjects where the learning outcome that contributes to the achievement of the attribute or competence of the graduate profile is **measured (M).**

Attach:

Portfolio of evidence of the results of the evaluations to the students of each subject of the curriculum where the attribute is measured: examples of three works (best, worst and average evaluation). Select those group projects, exhibitions, competitions, laboratories or others, **in which the achievement of the**  learning outcome(s) of the subject in which the graduate's attribute is best verified.

Incorporate this evidence as an Annex to the Self-Evaluation Report, criterion 8. RESULTS OF THE EDUCATIONAL PROCESS, aspect 8.d.

**Recommendations**

The attribute is measured (M) in those subjects in which the student begins to work on designing solutions to complex problems. In general, by definition of the training process, students in the first three years do not yet face this type of problem, so we are referring to subjects of higher courses.

The program will ensure that the subjects of the first years effectively contribute (A) to the achievement of these results, which you must be prepared to demonstrate as part of this process.

As a good practice, it is suggested to initiate the follow-up of a cohort from its inception to its end as a systematic model to follow to verify learning, analysis and collegial evaluation of the achievement of the graduate's attributes.

## TABLE 3: of enrollment, retention and graduation of the last 10 years

This table presents the statistical information explicitly disaggregated by location, daytime or evening schedule and modality, when applicable, and a table consolidating the information. Acredita CI provides the format for this. This table is published on the Agency's Website:

<https://acreditaci.cl/en/engineering-accreditation/manuals-and-forms/>

Examples[[4]](#footnote-4):







1. To prevent potential conflicts of interest when proposing the Peer Evaluation Committee to the program, Acredita CI requests the Institution to report the name of any Higher Education Institution with which it may share or have a relationship of ownership or administration. [↑](#footnote-ref-1)
2. All the schedules and modalities in which the program is taught and that are in force or in the process of closing must be reported provided that it has students studying, which can be: daytime or afternoon; in face-to-face, blended or remote mode, regular programs. [↑](#footnote-ref-2)
3. This Code is obtained from the Database provided by the Website and [www.mifuturo.cl](https://ssl.microsofttranslator.com/bv.aspx?ref=TVert&from=&to=en&a=www.mifuturo.cl) as Single Code.

The program presented to the accreditation process, as well as each of the locations, schedules and modalities reported in this Application, must be those in force at the time of this presentation and at the same time this information must match the information presented in the Database of the Information System for Higher Education (SIES). In the event that the current offer does not match what is indicated in SIES (SIES presents another offer in addition to the current one or the offer is not informed in SIES), explain the reasons why this information does not match as well as the steps to be taken by the Institution to solve it. Please indicate this in the "Observations" column. [↑](#footnote-ref-3)
4. Please consider a period of 5 years in the tables requested. What is presented is an example of the required data. [↑](#footnote-ref-4)