Guidelines on the presentation of the Bachelor's thesis for degree programs seeking ABET accreditation.

Introduction

The Bachelor's thesis (hereinafter TFG) represents the last stage of the student's training. The TFG is an autonomous activity of the student with the support of one or more tutors where the final result is an individual work of the student, defended before a board.

Scope of application

The scope of application of these guidelines is the TFGs in any of the Degrees taught at the ETSII of Valencia that opt for international accreditation ABET (hereinafter Degrees).

The regulations in force, without prejudice to these guidelines, are the current UPV Regulations (hereinafter, the Regulation). The Regulation is available on the UPV website and in the Ebrón application[1]. Students can check if a Poliforma-t has been created for their degree that complements these guidelines. The student is advised to consult the Ebrón manuals for the "student" role when using the application. On the other hand, they should also follow the instructions and advice they receive from their tutor(s).

TFG theme and mentoring

Possible topics that may be the object of TFG

As stated in Art.2 of the Regulation, The TFG "shall consist of an original work or project in which knowledge, skills, and competencies acquired by the student throughout their studies and, expressly, the competencies associated with the TFG subject as indicated in the verification report of the degree."

In the Degrees, the TFG should constitute a major design experience, which allows the student to incorporate appropriate engineering standards and multiple constraints and builds on the knowledge and skills acquired during the degree. Engineering design is a process of conceptual development of a system, component, or process to meet desired needs and specifications within constraints. It is an iterative and creative decision-making process in which basic sciences, mathematics, and engineering sciences are applied to convert resources into solutions. Engineering design involves identifying opportunities, developing requirements, performing analysis and synthesis, generating multiple solutions, evaluating solutions against requirements, considering risks, and making trade-offs in order to obtain a high-quality solution under the given circumstances. For illustrative purposes only, possible constraints include accessibility, aesthetics, standards, constructability, cost, ergonomics, extensibility, functionality, interoperability, legal considerations, maintainability, manufacturability, marketability, policies, regulations, schedule, standards, sustainability, or usability.

[1] Ebrón is the application used by the UPV to manage all processes related to the TFGs. It is accessed with the role "student," "tutor," "board," or others.

The student must perform, in an active way, an applied and overall work, preferably multidisciplinary, equal or similar to engineering work in the practice of the profession, with the limitation of the teaching load (hours of work) that has been established for their degree.

Whatever the content, the TFG must conform to the Regulation and apply to a practical case. Possible TFG topics are all those that are specific to the corresponding degree.

Tutor

Each TFG will have at least one academic tutor (as established in Art. 3 of the Regulation). Any active academic staff of the UPV or any teaching collaborator can carry out the function of tutor or co-tutor, regardless of their center of assignment.

The TFG carried out in collaboration with companies or institutions must be formalized by means of an educational cooperation agreement, in which there must be an external co-tutor with a contractual relationship with the company or institution where the work is carried out.

TFG and tutor search

The ETSII must guarantee that every student enrolled in that subject has a TFG and a tutor assigned. At ETSII, this assignment is made in two different ways:

1. **Pre-concert, which is the most common type of assignment**. A potential mentor is approached by the person interested in a topic. An initial approach to the TFG is made. Once the title and abstract of the potential TFG are agreed upon, the proposal is submitted, as described below.
2. **Search in a catalog of TFGs, which is the minority assignment type.** The ETSII, through its media, will publish a catalog of TFGs proposed by potential tutors. The interested party contacts the potential tutor. If agreement is reached on the subject and title of the possible TFG, the proposal is submitted, as described below.

ETSII does not use the auction system of the Ebrón application.

TFG's proposal.

The TFG proposal will be created either by the tutor or the student, with the tutor's endorsement, in Ebron. Proposals submitted should include an outline of the key aspects set out in the TFG executive summary, in particular approach, objectives, and method (including key aspects where the design process is envisaged to be applied - approach, analysis, appraisal, evaluation, and justified selection of alternatives taking into account current regulations and multiple other constraints). In particular, the following sentence should be included in the summary in EBRON: "The student and the tutor of this TFG are aware and confirm that the TFG will comply with the aspects indicated in the executive summary." The executive summary is in annex 3 of this document.

The proposals will be studied by the Academic Committee of the corresponding Degree (hereinafter, CAT) and, according to Art. 8 of the Regulation, will be approved, rejected, or rejected with the possibility of correction. Once the proposal is approved, the status of the TFG is "Assigned to a student," and the student can see it through their virtual secretary.

During the entire academic year, the deadline for creating proposals is open. However, it is advisable to do so as soon as there is an agreement between the student and the tutor. It is strongly recommended not to wait until the work is advanced or to do it shortly before the call to present the TFG. There is a risk that the CAT will reject the proposal or propose significant modifications. To avoid these situations, the ETSII may establish and publish minimum deadlines for the submission of proposals.

Confidential proposals.

When the proposal is created, it is possible to request that the TFG be confidential due to the possible existence of agreements with companies or the possibility of generating patents. It is up to the CAT to grant this request. If the TFG is confidential, the defense procedure changes. Therefore, it is advisable to request confidentiality only when it is indispensable.

Assigning and unassigning work to a student

The student must be enrolled in the subject to be formally assigned a TFG. The assignment is valid for two years. However, it can be extended through Ebrón.

In the event that a student wants to disengage from the TFG assigned to them, they must submit a letter to the CAT (available in ETSIInet) to the secretary's office of the ETSII to resign from it. When the agreement between the tutor and the student is revoked by mutual agreement, the proposal is automatically removed. When it is a request from one of the parties, the CAT will collect information and resolve it.

Realization of the TFG

Once the TFG proposal has been approved, the student must develop it until, according to their tutor's criteria, the work is finished, is of a sufficient level, and the workload established for their degree has been completed.

Changes in the title or abstract of the TFG during its completion.

If, during the completion of the TFG, it becomes apparent that its title should be changed or particularized, there is a procedure for requesting a title change through Ebron. If necessary, it is advisable to use it since, at the time of submission, Ebron will automatically generate the title page with the existing information in the database. A change in the language of preparation can also be requested.

Specifications on content and presentation format

As established in Art.10 of the Regulation, the TFG can be presented and defended in Spanish, Valencian, or English.

TFG documents should be such as to allow:

- To know perfectly what the problem to be solved is and how it has been solved by applying engineering design processes.
- To a technician other than the author to direct the construction, implementation, or manufacture of the designed system, reproduce the experiments in the laboratories, or interpret the studies performed.

To achieve this, it is advisable to follow the specifications in Annex I of these guidelines. The student can also check whether a Polyformat has been activated for the TFG in their degree and whether there are complementary guidelines for some TFG topics. In any case, the tutor will ultimately determine what the content of the TFG should be.

The recommendations in Annex II are intended to standardize the appearance of the documents, save time, and resolve common doubts. It is optional to follow these recommendations, the tutor's instructions prevailing.

Degree of alignment of the work on the Sustainable Development Goals.

According to the Regulation, when presenting the TFG, the student must incorporate information on the degree of relationship of his or her work with the Sustainable Development Goals and Targets of the 2030 Agenda (hereinafter, SDGs). In Annex I of the Regulation, a table is provided to measure this degree of relationship. So, it is advisable to include in the TFG text a completed table or a figure or similar text where a discussion on the matter is carried out.

TFG presentation and defense process

Filing and defense deadlines

In accordance with the Regulation, the ETSII will establish a minimum of four annual calls for the defense of TFG, which will be approved by the School Board and published in the ETSII media. In each of these calls, there will be deadlines for the submission (or deposit) of papers and their defense.

Submission procedure

During the dates provided in each call, and as long as the conditions established in Art. 11 of the Regulation are met, the student will request the defense of his/her TFG through Ebrón. It is recommended not to wait until the last hours of the Presentation period because if the student has any technical problem or lacks any documents, they may be left out of the call.

Contents of the application.

When requesting the defense, the following documents must be prepared in .pdf format for uploading to Ebron:

1. Complete TFG or main document. Ebron adds an automatically generated cover page, as explained above.
2. Evaluation rubrics specific to the ETSII, which will contain at least the aspects listed in Annex 4, completed by the student and the tutor.
3. The student's DNI, NIE, or Passport (scanned front and back).

Regarding document 1, it should be noted that it cannot be modified once the application has been made. This is the document that will be sent to the board. So, it is advisable to ensure that a final version is uploaded, refined, and without typos.

Regarding document 2, the tutor may prefer to deliver their evaluation rubrics alone. In that case, the students will hand in only the rubrics in which they self-assess themselves. It is then up to the tutor to complete the procedure, sending them on their own to the administrative services of the ETSII, who will incorporate them into the file of that TFG.

Destination of the documents delivered.

Once the TFG has been evaluated, document 1 will become part of the institutional repository (Riunet) as established in the regulations for the archiving and disseminating academic work at the UPV. The student must decide what type of dissemination can be made of their work. The rest of the documents remain under the custody of the ETSII.

Other information is required from the student.

In addition to the above documents, the student must enter additional verification information in Ebron, such as an abstract, keywords, the number of pages of the report, and optional geolocation data or possible sponsors or funders, if any.

When the student signs the defense application, Ebrón asks the student to complete a competency and employability assessment survey and a series of questions related to the SDGs, as discussed above.

Request for confidentiality.

In the application process, it is also possible to request that the defense be confidential due to the existence of agreements with companies or the possibility of generating patents on the content of the work. It is up to ETSII to grant this request.

It is advisable to request this confidentiality only when necessary because it conditions the defense procedure. The defense is closed to the public, and the board members must sign a confidentiality agreement.

Mode of defense (in person or virtual).

The student may request defense by videoconference (virtual). This request should be consistent with the information provided in document 4.

Defense procedure

It will be verified that the student fulfills the conditions to be able to present the TFG and that all the documents have been submitted correctly. A board will then be assigned. At that point, the student can no longer request cancellation of their application.

The student will be informed, by e-mail to the institutional address of the UPV, of the assigned session and time, as well as the location (face-to-face or virtual) where the defense of the work will take place. It is the student's responsibility to make sure that the e-mail address is operative.

Ebrón will then ask the tutor to prepare a report on the work done (only visible to the board), in which they must propose a grade for the work.

Defense before the board.

It is recommended that the student attend the call in advance since the board may change the order of the defenses. The defense call has the same official character as any other academic evaluation act, and it is the student's responsibility to ensure their physical or virtual presence and to have the necessary means to carry it out.

As the board will remind, the defense will last a maximum of 45 minutes. The student will have 15 minutes to present the work done, summarizing the most important phases. After the presentation, the board may ask questions about the presentation or the work presented. Throughout the defense, the student will follow the board's chairman's instructions, who may ask the student to summarize or clarify some of his points.

Evaluation of the TFG.

The board will use the ETSII rubrics as the basis for grading the paper.

The board will communicate the grade to the student once the defense is completed, signing the minutes at that moment or the end of the defense session. The board may grade a paper:

- As PASS (with a grade between 5 and 10),
- As PASS, with minor modifications, in that case, the minutes will be signed when the student makes the modifications suggested by the board, uploads the new version of their TFG, and the board secretary verifies that this has been done.
- As NOT PASSED. In this case, the board will generate a report for the student with the reasons for this grade. The student will be able to defend their improved TFG again in another exam of the same course. If the TFG is graded as NOT PASSED in the last exam of the course, the student will have to re-enroll in the subject if they want to defend it in the following course. Therefore, if it is decided to present the TFG in the last exam of the course (usually in September), it is advisable to have completed the work in such a way that there is a high degree of certainty of passing the defense.

Presentation of the TFG to awards.

There are several awards for TFGs by degree or subject, both within the ETSII and externally (company chairs, official schools, etc.). The student is advised to consult with the tutor and find out about these awards since many of the TFGs presented at the ETSII have a reasonable chance of winning one of these awards.

Annex 1. Structure and formal content of the TFG

Special features of the TFG

The TFG is fundamentally an academic exercise that confirms that the student has acquired some of the competencies established in the verification report of the degree. Therefore, it must clearly express both the justification and calculation of the solutions adopted.

Equivalent work carried out by a practicing professional is usually more concise in its approach to the problem and the proposed solutions, its analysis, evaluation, and the justified selection of the chosen solution. This is because the professional only has to specify the solution adopted and how it is to be put into practice. On the contrary, the student who carries out the TFG has to reason the solution chosen from among a set of possible alternatives according to the applicable regulations and the most important restrictions in the specific scope of the problem so that they can be evaluated for the use made of the knowledge acquired.

TFG Documents

The classic documentary structure of a professional project consists of the following four documents: Memory, Plans, Specifications, and Budget. A TFG could adopt a similar structure, provided that the time and thematic restrictions of the same require it.

The Memory is the document that describes the TFG, from its genesis and purpose to the study of the needs to be satisfied and the factors of all kinds taken into account to carry it out. Usually, the document is finalized last since it gathers all the incidences produced in its elaboration programmed for its execution. The memory comprises two differentiated parts: the Descriptive Memory or Memory itself and its annexes.

The Drawings are the graphic representation of the TFG. They will be of set and detail, and as many as necessary so that the object of the TFG is perfectly defined.

The Specifications must prescribe the material elements or instructions that make up the object of the TFG and regulate its execution, repetition, or implementation.

The Budget indicates the cost of the work. It shall consist of one or more partial , expressing the state of measurements and the details required for their valuation in addition to the unit prices and breakdowns.

A TFG should always consist, at least, of a Descriptive Memory (with a Budget included or separately). There are TFGs that, due to their subject matter, will not require Drawings. There are TFGs that will not require a separate Specifications document or a Drawings document due to their subject matter.

In any case, the TFG must be defined so that another sufficiently qualified person can interpret or direct the corresponding work according to it. In drafting a document, reference shall be made to any of the others when it is convenient for the complete interpretation of the work.

Contents of the Descriptive Memory of the TFG

The minimum recommended contents of the TFG Descriptive Report should be:

1. TITLE. The title must concisely and univocally define the object of the same.

2. INDEX (there should be a general index and a specific index for each document presented).

The table of contents should reflect the structure and central parts of the document, referencing the page of location in the right margin. Decimal classification is recommended. The table of contents should appear at the beginning of each document.

3. EXECUTIVE SUMMARY, duly completed according to the model in Annex 3.

4. OBJECTIVES OF THE WORK: The objectives and scope (scope of application, results obtained, etc.) of the TFG must be expressed entirely and univocally.

5. INTRODUCTION TO THE PROBLEM: BACKGROUND, MOTIVATION, and JUSTIFICATION.

A clear and detailed statement of the technological, theoretical, environmental, social (relation with the SDGs) or other problems to be solved with the project, as well as background information (pre-existing studies or projects) and alternative techniques or approaches that exist at the time the project is proposed. The motivation should expressly mention the academic nature of the TFG.

Justification of the TFG from the academic point of view (greater or lesser perfection and completeness of its development), as well as its technological, industrial, commercial, environmental, etc. interest.

6. NORMATIVE: Application of and compliance with Laws, Rules, and Regulations: Express mention should be made of the legislation in force applicable to the project, the project being carried out in a manner that ensures compliance. The student must verify that the applicable legislation is in force when submitting the TFG. The use of those standards that are not mandatory and that the designer deems appropriate to adopt shall also be justified. Due to its restrictive nature in the selection of solutions, this aspect may be included in the following (SCOPE OF APPLICATION AND RANGE OF WORK SOLUTIONS).

7. SCOPE AND RANGE OF WORK SOLUTIONS.

Presentation of solutions, hypothesis and/or calculation method, etc. Concerning the exposition of solutions, at least some basic aspect of the project must include an approach of alternatives, their analysis and evaluation, and the justification of the selection made following the regulations in force and other multiple restrictions that are convenient to contemplate in each case. If it is necessary to choose an approach or method of resolution among several possible ones, the reasons for this selection must be clearly and precisely justified.

8. Verification of the FEASIBILITY and IMPACTS of the Project. ECONOMIC STUDY AND BUDGET.

A study must be carried out to analyze the technological, economic, social, and environmental feasibility of the work by means of analyses of various kinds and considering aspects of health, welfare, and public safety. For economic feasibility, the necessary economic analyses will be carried out (investment budget, operating budget, etc.), including the valuation of the effort made and resources consumed in the development of the TFG as one of the investment costs.

The TFG should contain a specific document or section reflecting the BUDGET for the execution of the project (required in most projects). The impact of the project should also be analyzed by assessing the necessary technological, environmental, and social effects.

9. CALCULATIONS

In the TFG documents (usually as Annexes to the Report), all the calculations necessary to carry out the TFG must be detailed (if any). All the simplifications and calculation hypotheses adopted must be justified and expressed in the documentation submitted for evaluation.

10. Specification of the working CONDITIONS of the solution and the ways and means for the realization of the project (usually in a separate document).

The TECHNICAL, FACULTY, AND ECONOMIC REQUIREMENTS of the solution must be expressed, specifying the working conditions of the solution (working environment, materials to be used, applicable regulations, specifications for suppliers, etc.) to be met by all parties involved in the project. It shall also express, if applicable, the form and the execution deadlines.

In the case of a TFG whose main element is a computer program, a document (User's Manual, Programmer's Manual, or both) must be attached detailing the technical operating conditions of the program (hardware and software requirements), the rules of use to be followed by the users and the limits of application of the program.

11. Use of GRAPHIC REPRESENTATION media.

The TFG shall contain all those PLANS, SCHEMATICS, DIAGRAMS, or any GRAPHIC REPRESENTATION necessary for its correct interpretation and realization by any competent technician. If the Drawings Document is prepared, it shall contain all those required by the project, ordering them from minor (location, overall drawings) to greater detail (installations, circuit diagrams, etc.).

12. In general, commercial catalogs and standards shall be referenced in the documents but SHALL NOT BE INCLUDED. If deemed appropriate, they shall be included in an attached electronic format.

13. The complete computer listings, if included in the TFG, are recommended to be in a text file in electronic format attached.

Recommendation

The student, with the advice of their tutor, may adapt the structure and documentary content of the TFG according to the particular characteristics of the same, its time limitation (12 ECTS) as long as it covers the minimum contents recognized in the field or area of knowledge in which it is developed. It is understood that the minimum documents that should contain all the TFG presented would be the Memory and the Budget.

Annex 2. Recommendations for the formal presentation of the TFG

The following General Rules for .pdf presentation are recommended:

1. DIN A-4 format (297 X 210 mm), both sides.

2. The text is fully typed, and the plans are correctly delineated.

3. A top and bottom margin of 25 mm, a left margin of 30 mm, and a right margin of 25 mm should be left. All lines should have the same width. It is recommended to use the "Full or complete justification" mode.

4. All pages of each document shall be numbered consecutively, or otherwise consecutively by chapters (pg. 3.1. pg 3.2, etc.).

5. As a style standard, it is recommended that the wording of titles and sentences be direct and complete, paragraphs should be short, and the style should be impersonal and objective (for example: "have been analyzed" instead of "we analyzed").

6. Drawings, if available, shall be prepared in a standardized format, up to A4 format.

Box dimensions, units of measure, layout thicknesses, etc., shall be those established by ISO, UNE, and ASTM standards or specific instructions and standards.

Recommendations for the preparation of the text.

These standards are intended to achieve uniformity in the texts presented.

1. If possible, use a font no larger than 12 points and no smaller than 10 points for the general text. A Times font is recommended, but another font that allows for clear reading may be used.

2. Do not use line spacing greater than 1.3 points or less than single spacing.

3. Uniform spacing should be used throughout the text, except when more space is needed to improve readability (such as above and below equations) or as indicated for headings, subheadings, tables, and figures.

4. Prevent the last two paragraph lines from going to the top of the next page.

5. A decimal system should be used for numbering chapters and subchapters. It is not recommended to use more than 4 levels.

6. TITLE OF THE FIRST LEVEL SECTION: It is recommended to write it all in capital letters. It should be aligned with the left margin. It is recommended to leave a blank space above (concerning the previous paragraph) and a blank line before the following text.

7. First Subtitle: It is recommended to write it in upper and lower case letters (upper case for the initial letter of each significant word) and align it with the left margin. It is recommended to leave spaces between the subtitle and the subsequent text.

8. Second Subtitle: It is recommended to use italics and upper and lower case letters or underlining. It should be aligned with the left margin. Write the text on the same line, leaving five spaces between the last letter of the subtitle and the text.

9. A subtitle should not be placed on the last line of a page since it is preferable to end the page earlier. Place the title at the top of the next page.

10. Footnotes are indicated by superscript numbering.

11. Equations: All equations must be centered. It is recommended to leave a blank line between the text and the first line, center each line, and leave a blank line between each equation line and the following text. They should be numbered in parentheses on the right margin.

12. ILLUSTRATIONS: It is recommended to reserve enough space in the text for the illustration and to place them close to their comments or explanations. The figure and its caption should be on the same page. The caption should be placed immediately below the illustration, leaving a blank line between them and another line with respect to the preceding or following text. All illustrations should be numbered consecutively (Fig. 1. Fig. 2), otherwise, number them consecutively by chapters (Fig. 3.1, Fig. 3.2, etc.).

13. TABLES: Each table should be placed next to its explanation in the text. It is recommended to number the tables consecutively throughout the work. Leave two lines above and below the table. Write the table and the corresponding number in capital letters and then the title of the table centered on it. Try to center the table in the space for the text. When numerical data is presented, it is recommended to align the decimal character. If this is not possible, the figures should be centered. It is recommended to use only decimal places as necessary.

A homogeneous character must be chosen for the whole text.

14. REFERENCES: A list of bibliography, reviews, and references should appear at the end of the paper (usually as the last chapter of the Report) with the title BIBLIOGRAPHY and/or REFERENCES as the section title. Citations should be included in the text with Author (Year) format. Examples: http://blog.apastyle.org/apastyle/2011/01/writing-in-text-citations-in- apa-style.html

- Direct quotation: *systems ...(Pérez and Martínez, 2007; Alba, 2010).*
- Indirect: *As stated by Pérez and Martínez (2007), the systems.....*
- with more than two authors *(Gutiérrez et al., 2003)*

References not cited in the text should not be included in the bibliography.

It is suggested to use the APA format (http://www.apastyle.org/) for the bibliography; examples can be found in:

- http://www.upv.es/pls/obib/ser_bibpublicado.bib_download?p_id_lista={1330D426-5911-40DF-9286-645CACAE7444}&p_id_fila=192-{1330D426-5911-40DF-9286-645CACAE7444}&p_id_doc=192-{1330D426-5911-40DF-9286-645CACAE7444}0&p_idioma=c&p_vista=MS
- http://bib.us.es/aprendizaje_investigacion/publicar_citar/como_elaborar/references_bibliographic-ides-idweb.html
- http://www.ub.edu/biblio/citae-e.htm

Annex 3. Executive summary

CONCEPT (ABET)	Complies (Y/N)	Where (pages)
1. IDENTIFY:		
1.1. Problem statement and opportunity		
1.2. Constraints (standards, codes, needs, requirements, and specifications)		
1.3. Setting of goals		
2. FORMULATE:		
2.1. Creative solution generation (analysis)		
2.2. Evaluation of multiple solutions and decision-making (synthesis)		
3. SOLVE:		
3.1. Fulfillment of goals		
3.2. Overall impact and significance (contributions and practical recommendations)		

Minimum content rubric for ABET degrees.

The members of the board, after studying the TFG report and witnessing the defense exercise, must fill in the following table in which they evaluate on a scale of 0 to 4 the fulfillment of each of the following concepts:

CONCEPT	**0**	**1**	**2**	**3**	**4**
1. IDENTIFY:					
1.1. Problem statement and opportunity					
1.2. Constraints (standards, codes, needs, requirements, and specifications)					
1.3. Setting of goals					
2. FORMULATE:					
2.1. Creative solution generation (analysis)					
2.2. Evaluation of multiple solutions and decision-making (synthesis)					
3. RESOLVE:					
3.1. Fulfillment of goals					
3.2. Overall impact and significance (contributions and practical recommendations)					
4. COMMUNICATE					
4.1. Quality, clarity, and conciseness of the report					
4.2. Quality, clarity, and conciseness of the oral presentation.					

The meaning of the scores in each element is as follows:

0: The element is not present.
1: The element is present but is deficient.
2: The element is present and is correctly addressed.
3: The element is present and is addressed notably.
4: The element is present and addressed in an outstandingly

For a TFG to be approved, the score on all items is required to be equal to or higher than 2. If any item scores 0 or 1, the TFG cannot be approved. It must be improved and resubmitted until it is demonstrated that it adequately includes items 1, 2, and 3 in the table above.

The following is a detailed description of what should be assessed in each of the sections of the rubric to help the board in its assessment and also the student in planning and carrying out his or her work:

1.1.- **Problem and** opportunity **statement**

Is the problem or opportunity addressed by the work identified?

Explain why it is important to address this problem or opportunity in the field of ___

1.2.- **Constraints (regulations, codes, needs, requirements, and specifications)**

Are the requirements and limitations of all types relevant to the job disclosed?

Possible constraints include environmental, legal, codes and regulations, accessibility, aesthetics, constructability, cost, ergonomics, extensibility, functionality, interoperability, maintainability, manufacturability, marketability, policy, schedule, or usability.

Is there a demonstrated understanding of the impact of these requirements and constraints on the design process?

Is there an analysis of how the design conforms to the rules, Regulations, and best practices of the Titling industry?

1.3.- **Establishment of objectives**

Are the objectives of the work clearly stated?

Is the methodology to achieve these objectives (methods, materials, etc.) determined?

Are the objectives consistent with the problem statement, opportunity, and all relevant constraints?

2.1.- **Generation of creative solutions (analysis)**

Does it describe the creative and iterative process used to generate possible solutions?

Is the application of Degree Sciences, Mathematics, and Basic Sciences observed in the design process?

2.2.- **Evaluation of multiple solutions and decision-making (synthesis)**

Are multiple solutions evaluated against identified requirements?

Is information provided on the decision-making process and how different solutions were considered and compared, considering risks and reaching compromises?

3.1.- **Fulfillment of objectives**

Is it analyzed whether the solution achieved reasonably meets the proposed objectives under the circumstances?
Can the proposed solution be considered a good solution to the problem posed?

3.2.- **Overall impact and scope (contributions and practical recommendations)**

Is the impact of labor in general and in the field of industrial technologies in particular adequately discussed?

Are the adopted solution's contributions, limitations, and practical recommendations adequately described?

4.1.- **Quality, clarity and conciseness**

Are both the job report and the oral presentation of the work well organized and concise, providing a clear picture of the work performed?

Is the essence of the design process and its results effectively communicated?