

Escola Superior Politècnica

Teaching Quality and Innovation Support Unit

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TEACHER'S GUIDE FOR MONITORING AND ASSESSMENT BACHELORS FINAL PROJECTS

October 2012



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1. Description

The Bachelors Final Project (BFP) is a work done by students during the 4th course of their studies independently and guided by a director, who must be a professor at this school. It has a workload of 20 ECTS (Bachelor's Degree in Computer Science, Bachelor's Degree in Telematics Engineering, Bachelor's Degree in Audiovisual Systems Engineering) or 18 ECTS (Bachelor's Degree in Biomedical Engineering), without classes. It can be a project related to the research carried out in a department of the UPF or can be linked to any business practice that students have made. In any case, should serve as introduction to projects in their workplace as future engineers, and must allow them to implement competencies (transversal and specific) associated with the degree that is being pursued, and obtain an integrated assessment of these competencies.

The compulsory subject "Technical Project Management" and "Project Management and Innovation in Biomedical Engineering" (depending on the degree) will provide the necessary skills to develop projects in general and in particular the BFP. Moreover, early in the second quarter, the CRAI (Library and Information Technology) will run several workshops (with additional material on-line) for students enrolled in the BFP that reinforce aspects of information and IT skills useful for the realization of BFP (e.g., writing of report) and for preparation for tests ACTIC (Accreditation of Information and IT Skills, tests conducted by the university as an option).

The structure of the curricula contemplates that the BFP is made throughout the course, but with a different load according to the quarter. According to its director, the student must make a temporary planning of the BFP considering the other subjects in which it is registered (see section 2).

Students are required to write a report that collects all the work done throughout the BFP and defend it before a tribunal.

This presentation and defense will take place at the end of course, between the months of June and July.

The rating of the BFP is performed, 70%, by a panel of three teachers assigned to the ESUP. One is the director of the BFP, which acts as clerk. The other two, one acting as president and the other as a vocal, are appointed by the director of the School. In case any teacher (or an outside worker) has participated in the development of the work as technical supervisor, he/she may be part of the tribunal, with voice but no vote. The 30% of the rating remaining is proposed by the director from the observations made during the performance of the work (see section 3). Students are encouraged to review the assessment tools to be used by the tribunal and director as self-assessment tool to reflect on their own progress and identify potential ways to strengthen and encourage self-regulation.

The academic treatment of the BFP is comparable to other subjects: students have four calls to pass the BFP. In each course, students have a call to which they can resign if they think that they are unable to approve. In this case, it does not count as call.

2. Timing

The overall timing of every BFP must consider an initial and planning phase, an execution or development phase and an ending phase, as specified in Table 1. In each phase the student is expected to perform some tasks, implementing a number of competencies that the director will evaluate iteratively, providing feedback to students on their progress.

The table shows an estimate of hours of student involvement per phase. This is an estimate that can be adjusted (it can vary by case) and shelled by tasks. In each phase, the student must submit to the director at least a progress report (initial and planning report, execution or development report, memory draft BFP) and the director shall conduct at least one formative assessment of the competences worked.

The table can be used as a template when performing this general plan agreed between student and the director, also following the examples studied in the subjects "Technical Project Management" or "Project Management and Innovation in Biomedical Engineering".

| Phases | General tasks | Competences involved | Hours spent | Delivery date | Date of feedback / assessment |
|--|--|---|----------------|------------------|-------------------------------------|
| INITIAL AND PLANNING (10% - 15 % of ECTS) ¹ | -Definition of: the opportunity, the idea; the problem and its background; general objective or goal; specific objectives; and other aspects needed to define the BFP. (Project Charter or BFP's initial report. About 2-3 pages). - Formulation of the tasks and the deliverables. Elaboration of the plan, etc. (BFP plan. 10 pages maximum) - Initial tasks relating to specific aspects of the BFP (identification of information sources, etc.) - Mentioned reports: Initial report and plan definition. | Capacity for analysis and synthesis Ability to organize and plan Ability to search and information management Decision-making ability Specific competences | | | |
| EXECUTION (55% - 60 % of ECTS) | - Development of the state of the art / technique - Analysis / design / development of solutions to the problem / situation presented - Documentation and monitoring of the plan proposed - Report of development and results | Competences involved in the initial phase Ability to apply knowledge to analyze situations and solve problems Ability to flexibly and creatively apply acquired knowledge and apply it to new situations and contexts Ability to progress in the training and learning processes autonomously and continuously Capacity of motivation for quality and achievement Ability to generate new ideas | | | |
| FINAL (25% - 30% of ECTS) | - Assessment / testing - Drawing Conclusions - Writing of <i>the final memory/report</i> - Making the presentation and answering questions from the tribunal | Competences involved in the initial and execution phases Ability to communicate properly, written and verbally, in front of audiences both expert and inexperienced | | | Tribunal Defense- Tribunal |

 $Table\ 1.\ Structure\ of\ the\ general\ timing\ of\ BFP.\ Its\ concretion\ (white\ boxes)\ should\ be\ agreed\ between\ the\ student\ and\ the\ director.$

 $^{^{1}}$ The percentages correspond to the fraction of the approximate load of ECTS credits of the BFP (500 hours in the ICT degrees and 450 in Biomedical Engineering degree).

3. Assessment

3.1. Monitoring and continuous assessment by de director

Table 2 allows for continuous monitoring and assessment by the director. It proposes a series of indicators associated to sets of competencies. Annex A.2 includes assessment rubrics for transversal competencies (or general), each indicator contains four guidance levels of achievement. These levels range from "1" to "4", where "1" indicates an insufficient achievement in the context of BFPs, "2" an adequate achievement, "3" a remarkable achievement, and a "4" indicates excellent. In the case of specific skills, as these are defined in relation to the particularities of each BFP, assessment is done according to criteria of achievement associated to indicators defined by the director (these criteria can consider aspects of difficulty, applicability, etc., as appropriate).

Continuous assessment has a weight of 30% in the rating of BFP. Half of this grade (15% of the total score) corresponds to the valuations of generic skills indicators and the other half (15% of the total score) to specific skills.

The specific rating for each set of indicators (transversal and specific) as assessed by continuous assessment may be defined by the director, taking into account the following conditions, according to results of the latest continuous assessment:

- If in 70% of cases the indicators have been evaluated with a "4", and the remaining 30% corresponds to indicators evaluated with a "3" it can be qualified with excellent (≥ 9) .
- If the total number of indicators have been evaluated with "4" or "3" but fails to meet the previous condition, or there are at most two "2", the work can be graded as remarkable (≥ 7 and ≤ 9).
- In all other cases, and if none of the indicators has been rated with a "1", the work will be graded on a pass (≥ 5 y < 7).
- The work can not pass the continuous assessment if any of the indicators is evaluated with a "1" (<5).

There is the possibility that some of the stated competencies is not addressed in the work, and therefore not appropriate for assessment in a particular BFP. In that case, you may not include it in the assessment by indicating in corresponding space a "not relevant".

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²For example, it can happen that the indicator *delineation of objectives and processes* from the competence *Decision-making ability* is not applicable since the objectives and processes have been defined by the director instead of the student; in that case it may be indicated as "not relevant".

| | Competence // Set of competences | | Rating by phase | |
|--------------------------|---|-------------|---------------------|-------------|
| | D1 ³ Capacity for analysis and synthesis, Organization and planning ca | apacity, Ab | ility to search and | d |
| | information management | | | |
| | Indicators: | Initial | Execution | Final |
| | D1.1 Quality and quantity of sources; contrasted information | | | |
| ر | D1.2 Relevance of the information submitted and depth in the state of | | | |
| TRANSVERSAL INSTRUMENTAL | affairs | | | |
| Ž | D1.3 Planification of the tasks to be developed | | | |
| M | D2 Decision-making ability | 1 | T | |
| RU | Indicators: | Initial | Execution | Final |
| ST | D2.1 Definition of the objectives and methodology with regards to | | | |
| Z | decisions previously made | | | |
| ₹ | D2.2 Justification and reasoning throughout the development of the | | | |
| RS. | work D3 Ability to apply knowledge to analyze situations and solve problem | nc | | |
| Œ | Indicators: | Initial | Execution | Final |
| SN | D3.1 Application of lessons learned during the course to analyze the | Initial | Execution | rmai |
| A | problem situation and its resolution | | | |
| TR | D4 Ability to communicate properly in writing format in front of aud | iences both | expert and inexi | perienced |
| | Indicators: | Initial | Execution | Final |
| | D4.1 Presentation and consistency of product / results | | | |
| | D4.2 Syntactic and spelling correction | | | |
| | D4.3 Rigorous treatment and presentation of information | | | |
| | | l | | |
| | D5 Ability to flexibly and creatively apply acquired knowledge and ap | ply them to | new contexts an | d |
| IC | situations, ability to progress in training and learning processes aut | | and continuousl | y, capacity |
| EΜ | and motivation for quality and achievement, capacity to generate n | ew ideas | | |
| ST. | Indicators: | Initial | Execution | Final |
| TRANSV. SISTEMIC | D5.1 Autonomous and creative adaptation of the knowledge acquired | | | |
| | during the degree to new situations | | | |
| Ž | D5.2 Review and optimization of the proposal | | | |
| RA | D5.3 Independently raises revising and rewriting of theories and | | | |
| L | techniques | | | |
| · | GRADE FOR CONTINUOUS ASSESSMENT OF TR | ANSVERSAI | L COMPETENCES | |
| | | Initial | Execution | Final |
| | Specific competencies related to the BFP: | | | |
| | ~ <i>I</i> · · · · · · · · · · · · · · · · · · · | | | |
| | | | | |
| Γ | | | | |
| SPECIFIC | Indicators: | | | |
| ΈC | | | | |
| SF | | | | |
| | | | | |
| | | | | |
| | | | • | |

Table 2. Table for monitoring and assessment of BFP used by the director. In each blank box the director must place an achievement level associated with each indicator.

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³ The numbering of the table corresponds to the numbering of skills and indicators described in the rubrics in order to facilitate its use.

3.2. Assessment by the tribunal

The tribunal evaluates the BFP using Table 3. As in the continuous assessment, each indicator can be evaluated from 1 to 4, both for the transversal competences (according to the rubrics in Annex A.3) as for the specific ones (depending on the level of achievement assessed by the tribunal, which may consider aspects of difficulty, applicability, etc., as appropriate).

The assessment performed by the tribunal takes place in two phases. In the first phase, the tribunal reviews the draft version of the memory and agrees if the BFP can be presented, which means that the assessment of the preliminary indicators in Table 4 exceed the rating of "1" (they all have been rated "2" or more, or the assessment of any indicator in "non relevant" given the particularities of the BFP). Likewise, the tribunal may indicate areas for improvement so that they can be considered by the student in the final version of the report and presentation. The second (and final) assessment by the tribunal is made after the presentation and defense of the work.

The assessment by the tribunal has a 70% weight in the rating of BFP. Half of this qualification (35% of the total score) corresponds to the valuations of transversal competences indicators and the other half (35% of the total score) to specific ones. The rating will be agreed by the tribunal taking into account the following conditions as the assessments made in the table:

- If in 70% of cases the indicators have been evaluated with a "4", and the remaining 30% corresponds to indicators evaluated with a "3" it can be qualified with excellent (≥9).
- If the total number of indicators have been evaluated with "4" or "3" but fails to meet the previous condition, or there are at most two "2", the work can be graded as remarkable (≥ 7 and ≤ 9).
- In all other cases, and if none of the indicators has been rated with a "1", the work will be graded on a pass (\geq 5 y <7).
- The work can not pass the continuous assessment if any of the indicators is evaluated with a "1" (<5).

| | Competence // Set of competences | | ng | | | |
|--------------------------|---|-------------------|-------|--|--|--|
| | Competence // Set of competences | Preliminary 4 | Final | | | |
| | T1. Capacity for analysis and synthesis, organization and planning capacity, | Ability to search | and | | | |
| • | information management | | | | | |
| • | Indicators: | | | | | |
| | T1.1 Quality and quantity of sources; contrasted information | | | | | |
| | T1.2 Relevance of the information submitted and depth in the state of affairs | | | | | |
| ı | T1.3 Planification of the tasks to be developed | | | | | |
| T | T2. Decision-making ability | | | | | |
| Ä | Indicators: | | | | | |
| FRANSVERSAL INSTRUMENTAL | T2.1 Justification and reasoning process throughout the development of the work | | | | | |
| IR | T3. Ability to communicate properly written and verbally in front of audien | ces both expert a | ınd | | | |
| S | inexperienced | • | | | | |
| | Indicators: | | | | | |
| SA | T3.1 Consistent presentation of the product / results | | | | | |
| ₩ K | (both in memory and in the presentation) | | | | | |
| <u> </u> | T3.2. Syntactic and spelling correction (of the written work – memory and presentation – and the verbal presentation) | | | | | |
| Ž | T3.3 Rigorous treatment and presentation of information | | | | | |
| R | (both in memory and in the presentation) | | | | | |
| | T3.4 Nonverbal language, tone of voice, cadence and pronunciation | | | | | |
| | T4.Ability to apply knowledge to analyze situations and solve problems | | | | | |
| | Indicators: | | | | | |
| | T4.1 Applying the knowledge learned during the degree to analyze the problem | | | | | |
| | situation and its resolution | | | | | |
| | (both as seen in the memory as the answers to the questions of the tribunal) T5. Ability to generate new ideas | | | | | |
| · · | Indicators: | | | | | |
| TRANS. SISTEMIC | | | | | | |
| TRANS. | T5.1 Generation of innovative ideas/aspects | | | | | |
| ST | | | | | | |
| S | | | | | | |
| | | | | | | |
| 1 | GRADE BY THE TRIBUNAL FOR TRANSVERSAL | COMPETENCES | | | | |
| | Specific competencies ⁵ related to the BFP: | | | | | |
| FIC | | | | | | |
| Œ | I. Partana | | | | | |
| \Box | Indicators: | | | | | |
| SPECÍ | | | | | | |
| • | | | | | | |
| | | | | | | |
| | GRADE BY THE TRIBUNAL FOR SPECIFIC | COMPETENCES | | | | |
| Com | ments regarding the assessment of the preliminary memory: | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

Table 3.Assessment grid used by the tribunal. In each blank box the tribunal should place an achievement level associated with each indicator.

⁴ In the preliminary assessment it is only necessary to identify whether the assessment of any indicator is "1". In this case the BFP could not be presented.

⁵ It should be used as defined by the director for Table 3.

3.3. Calculating overall rating

The final grade is calculated using the weights mentioned in sections of continuous assessment and assessment by the tribunal.

| Ratings | Weight | Mark |
|--|--------|------|
| GRADE FOR CONTINUOUS ASSESSMENT OF TRANSVERSAL COMPETENCES | 15% | |
| GRADE FOR CONTINUOUS ASSESSMENT OF SPECIFIC COMPETENCES | 15% | |
| GRADE BY TRIBUNAL FOR TRANSVERSAL COMPETENCES | 35% | |
| GRADE BY TRIBUNAL FOR SPECIFIC COMPETENCES | 35% | |
| Overall rating | | |

Table 4. Table for weighing the overall rating of the BFP.

Annexes

A.1. The drafting of specific competencies. Examples

In order to enter into the assessment grid specific skills that are evaluated in the DFP it may be useful to consider the following examples and how they are written. First exposing if it is a skill or ability and then describing the performance of competition itself (e.g. "Ability to design and implement IT projects") specifying, if you will, some conditions (e.g. "using the principles and methods of engineering").

Examples:

- Ability to conceive and implement IT projects using the principles and methodologies of engineering.
- Ability to conceive, develop, organize and manage systems and services in corporate and institutional
 contexts to improve their business processes, taking responsibility and leading its implementation and
 continuous improvement and assess their economic and social impact.
- Ability to apply basic elements of economics and human resource management, organization and planning of projects, as well as legislation, regulation and standardization in telecommunications.
- Ability to independently learn new knowledge and techniques for the design, development or operation of telecommunications systems and services.
- Ability to build, operate and manage services and telecom applications, the latter being understood as feedback systems, analog and digital processing, encoding, transport, representation, processing, storage, reproduction, management and presentation of audiovisual and multimedia information.
- Ability to analyze, specify, implement and maintain systems, equipment, and facilities television headers, audio and video, both fixed and mobile environments.

A.2. Rubrics for competence assessment for directors

The competence assessment rubrics define achievement levels (1: insufficient, 2: adequate, 3: remarkable, 4: excellent) for each of the indicators that are grouped in the definition of each general / transversal competence.

The following is the assessment rubric identifying competencies and indicators as they appear in the table of records.

| D1 | Capacity for analysis and synthesis, organization and planning capacity, Ability to search and manage information | | | | | |
|------|--|---|--|---|---|--|
| | Level of achievement/ Indicators | 1 | 2 | 3 | 4 | |
| D1.1 | Quality and quantity of sources and contrast of information | Insufficient use of sources of information essential in the study of the subject worked in the BFP Erroneous information | The student uses essential information sources, but not diverse (in terms of authors, font types, etc.) No attention is paid to the quality of the sources used | Rich use of sources of information, with some attention to their diversity (in terms of authors, font types, etc.) Some attention is paid to the quality of the sources used | Rich use of diverse sources of information (in terms of authors, font types, etc.) Attention is paid to the quality of the sources, which are triangulated to verify the information | |
| D1.2 | Relevance of the information and depth of the state of the art | No understanding of basic and essential elements of the subject Incomplete information regarding the addressed topic | It includes all the basic information of the subject worked in the BFP Other not significant related aspects | - Complete view of the subject worked - All critical information (basic and supplementary) | - Complete and detailed view of the subject worked - All critical information (basic and supplementary) - There is a differentiation between the essential information and the dispensable information | |
| D1.3 | Planning the tasks to develop | - There is no forecast of the tasks to be realized | Defined tasksNo order or timing is clearly established or it is very shallow | - Defined tasks - Temporal progression of tasks | Defined tasks Temporal progression of tasks, specifying the workload and resources needed for each task | |

| D2 | | Decision-making ability | | | | | |
|-----------|---|--|--|--|---|--|--|
| | Level of achievement/ Indicators | 1 | 2 | 3 | 4 | | |
| D2.1 | Delimitation of the objectives and methodology with respect to decisions | - Difficulty in delineating the objectives and the methodology to be followed according to the existing possibilities, fuzzy and imprecise approximation | - Formulation of different objectives and the methodology to be followed but too broadly | - Proper formulation of objectives and the methodology to be followed, but could improve its clarity / concreteness, arguing coherently decisions to reach their formulation | - The student formulates objectives and the methodology to be followed in a clear, concise and specific manner, consistently arguing decisions to reach their formulation | | |
| D2.2 | Justification and reasoning throughout working period | - No reasons argued on the approach to the development of solutions and work | - Reasons argued on the approach to the development of solutions and work, but with lack of alternatives | - Reasons argued on the approach to the development of solutions and work with some reflection on different alternatives. | - Reasons argued on the approach to the development of solutions and work with reflection justified and coherence regarding alternatives, evaluating opportunities, risks and limitations | | |

| D3 | | Ability to apply knowledge to analyze situations and solve problems | | | | |
|-----------|---|--|--|---|---|--|
| | Level of achievement/ Indicators | 1 | 2 | 3 | 4 | |
| D3.1 | The student applies the lessons learned during the degree to analyze the problem situation and its resolution | - Confusing or wrong relations, on a practical or theoretical levels, and lack of planning with regards to solutions | - The student analyzes the problem situation from a few theories, techniques or procedures acquired during the degree and poses no clear solutions | The student analyzes with remarkable depth the problem situation from a variety of theories, techniques and procedures The approach to solving the problem is not very coherent / viable | Establishes consistent and valid relationships in both theoretical and practical aspects to perform a complete analysis of the problem situation It reaches an approach to solving the problem consistent and satisfactory | |

| D4 | | Ability to communicate prop | perly, written and verbally, in from | nt of audiences both expert and inex | sperienced ⁶ |
|-----------|--|---|--|---|---|
| | Level of achievement/ Indicators | 1 | 2 | 3 | 4 |
| D4.1 | Consistent presentation of the product / results obtained | - The narration is disorganized, and ideas are mixed or recurring. No homogeneity between the different sections. | - The narration is organized but is incomplete, some ideas are mixed hindering the comprehension. There is certain consistency among the different sections | - The narration is organized and is reasonably complete. Although some ideas are mixed, understanding is not hindered. There is homogeneity among paragraphs, with introduction and conclusion of ideas | - The narration is very well organized and complete. The ideas are presented in a clear and understandable manner, using visual resources and examples. There is homogeneity among paragraphs, with a good introduction and conclusion of ideas |
| D4.2 | Syntactic and spelling correction | - The student makes multiple spelling mistakes and numerous errors in the syntactic construction of sentences. There is no use (or misuse) of connectors, punctuation, etc. | - The student makes some spelling mistakes and errors in the syntactic construction of sentences. Frequent incorrect use of connectors, punctuation, etc. | - In overall the writing is correct, although there may be syntactic or spelling minor errors, or misuse of a connector or punctuation mark | - The writing is very well kept, the sentences are syntactically correct, there are no spelling mistakes, and connectors and punctuation are properly used |
| D4.3 | Rigorous treatment and presentation of information | - The use of vocabulary and technical terms is inadequate, the sources of information used are not cited. | - The use of vocabulary and technical terms is adequate although could be more rigorous, some sources of information are cited but the references are listed with incomplete information and without a consistent format | - The use of vocabulary and technical terms is generally rigorous, with citations to the sources of information used and providing the complete list corresponding to these sources, although with some formatting inconsistencies. | - The use of vocabulary and technical terms is rigorous, with citations to the sources of information used and providing the complete list corresponding to those sources. Both citations and references are presented uniformly. |

⁶ In this case (in the continuous assessment for the monitoring and progress of students) only written work will be considered. Oral communication will be assessed by the tribunal.

| D5 | Abil | Ability to flexibly and creatively apply acquired knowledge and apply it to new situations and contexts | | | | |
|-----------|--|--|--|--|--|--|
| | | Ability to progress in t | training and learning proces | ses autonomously and contin | uously | |
| | | Motivation for | r achievement and quality, a | bility to generate new ideas | | |
| | Level of achievement/ Indicators | 1 | 2 | 3 | 4 | |
| D5.1 | Autonomous and creative transfer of learning during the degree to new situations | - There are difficulties in applying the lessons learned in the degree to new / different problem / situations | - With great guidance by the director, the student applies the lessons learned in the degree to new / different problem / situations | - With reasonable guidelines from the director, he student applies the lessons learned in the degree to new / different problem / situations | - There are resources that complement the guidelines of the director in order to apply what was learnt learned in the degree to new / different problem / situations | |
| D5.2 | Revision and optimization of proposal | - Work is performed according to the initial ideas, without criticism or self-assessments and without making desirable modifications identified during the process | - The student makes minor revisions and modifications to provide a work that meets the requirements (initial ideas) | - The student makes certain revisions and modifications of the work, according to some self-assessments and some indications of the director | - The student reviews the work as it is developed and modifies the elements that require it according the indications of the director and a critical reflection on the quality of work | |
| D5.3 | The student poses independently revising and rewriting of theories and techniques | - The student only draws ideas and proposals presented by the director | - The student uses ideas taken from other professionals applying minor modifications | - The student reworks ideas from other professionals introducing coherent changes according to the particularities of the BFP | - The student explains and applies personal approaches from a critical reflection on theories and techniques raised by other professionals | |

Table 5. Rubric for assessment of BFP to be used by the director

A.3. Rubrics for competence assessment for the tribunal

The following is the assessment rubric identifying competencies and indicators as they appear in the table of records, as well as the different levels of achievement (1: insufficient, 2: adequate, 3: remarkable, 4: excellent)

| T1 | Capac | Capacity for analysis and synthesis. Ability to organize and plan. Ability to search and manage information | | | | |
|-----------|---|--|---|--|---|--|
| | Level of achievement/ Indicators | 1 | 2 | 3 | 4 | |
| T1.1 | Quality and quantity of sources and contrast of information Relevance of the information and depth of the state of the art | Insufficient use of sources of information essential in the study of the subject worked in the BFP Erroneous information No understanding of basic and essential elements of the subject Incomplete information regarding the addressed topic | The student uses essential information sources, but not diverse (in terms of authors, font types, etc.) No attention is paid to the quality of the sources used It includes all the basic information of the subject worked in the BFP Other not significant related aspects | Rich use of sources of information, with some attention to their diversity (in terms of authors, font types, etc.) Some attention is paid to the quality of the sources used Complete view of the subject worked All critical information (basic and supplementary) | Rich use of diverse sources of information (in terms of authors, font types, etc.) Attention is paid to the quality of the sources, which are triangulated to verify the information Complete and detailed view of the subject worked All critical information (basic and supplementary) There is a differentiation between the essential information and the | |
| T1.3 | Planning the tasks to develop | - There is no forecast of the tasks to be realized | Defined tasks No order or timing is clearly established or it is very shallow | Defined tasks Temporal progression of tasks | dispensable information - Defined tasks - Temporal progression of tasks, specifying the workload and resources needed for each task | |

| T2 | Decision-making ability | | | | |
|-----------|---|--|--|---|--|
| | Level of achievement/ Indicators | 1 | 2 | 3 | 4 |
| T2.1 | Justification and reasoning throughout work | - No reasons argued on the approach to the development of solutions and work | - Reasons argued on the approach to the development of solutions and work, but with lack of alternatives | - Reasons argued on the approach to the development of solutions and work with some reflection on different alternatives. | - Reasons argued on the approach to the development of solutions and work with justified and consistent reflection about alternatives, evaluating opportunities, risks and limitations |

| T3 | Ability to communicate properly written and verbally in front of audiences both expert and inexperienced | | | | | |
|-----------|---|---|--|---|---|--|
| | Level of achievement/ Indicators | 1 | 2 | 3 | 4 | |
| T3.1 | Consistent presentation of the product / results obtained (both in the memory and in the presentation) | The narration is disorganized and ideas are mixed or recurring. No homogeneity between the different sections. | - The narration is organized but is incomplete, some ideas are mixed hindering the comprehension. There is certain consistency among the different sections | - The narration is organized and is reasonably complete. Although some ideas are mixed, understanding is not hindered. There is homogeneity among paragraphs, with introduction and conclusion of ideas | - The narration is very well organized and complete. The ideas are presented in a clear and understandable manner, using visual resources and examples. There is homogeneity among paragraphs, with a good introduction and conclusion of ideas | |
| T3.2 | Syntactic and spelling correction (written narrative - in memory and presentation - and words spoken with refers to the syntax) | - The student makes multiple spelling mistakes and numerous errors in the syntactic construction of sentences. There is no use (or misuse) of connectors, punctuation, etc. | - The student makes some spelling mistakes and errors in the syntactic construction of sentences. Frequent incorrect use of connectors, punctuation, etc. | - In overall the writing is correct, although there may be syntactic or spelling minor errors, or misuse of a connector or punctuation mark | - The writing is very well kept, the sentences are syntactically correct, there are no spelling mistakes, and connectors and punctuation are properly used | |
| T3.3 | Rigorous treatment and presentation of information (both in the memory and in the presentation) | - The use of vocabulary and technical terms is inadequate, the sources of information used are not cited | - The use of vocabulary and technical terms is adequate although could be more rigorous, some sources of information are cited but the references are listed with incomplete information and without a consistent format | - The use of vocabulary and technical terms is generally rigorous, with citations to the sources of information used and providing the complete list corresponding to these sources, although with some formatting inconsistencies. | - The use of vocabulary and technical terms is rigorous, with citations to the sources of information used and providing the complete list corresponding to those sources. Both citations and references are presented uniformly. | |
| T3.4 | Nonverbal language, tone of voice, cadence and pronunciation | - Little vocalization and monotonous narration due to the cadence | Vocalization is adequate but the tone of voice, nonverbal language and cadence make the narration unattractive | - The tone of voice and cadence are adequate, there is some use of nonverbal language | - The vocalization and cadence are adequate, with changes that allow voice to emphasize certain elements and with good use of nonverbal language, according to the explanations | |

| T4 | Ability to apply knowledge to analyze situations and solve problems | | | | | | |
|-----------|---|--|--|---|---|--|--|
| | Level of achievement/ Indicators | 1 | 2 | 3 | 4 | | |
| T4.1 | The student applies the lessons learned during the degree to analyze the problem situation and its resolution (both as seen in the memory as the answers to the questions of the tribunal) | - Confusing or wrong relations, on a practical or theoretical levels, and lack of planning with regards to solutions | - The student analyzes the problem situation from a few theories, techniques or procedures acquired during the degree and poses no clear solutions | The student analyzes with remarkable depth the problem situation from a variety of theories, techniques and procedures The approach to solving the problem is not very coherent / viable | - Establishes consistent and valid relationships in both theoretical and practical aspects to perform a complete analysis of the problem situation - It reaches an approach to solving the problem consistent and satisfactory | | |

| T5 | Ability to generate new ideas | | | | | |
|-----------|--|--|--|--|--|--|
| | Level of achievement/ Indicators | 1 | 2 | 3 | 4 | |
| T5.1 | The student presents innovative ideas | - Innovative ideas cannot be detected in the development of the work, in the conclusions, or in future work derived from the BFP | - Innovative ideas can be detected in the development of the work, conclusions, or future work proposals derived from the BFP, but with some limitations regarding their interest, coherence or plausibility | - Any coherent and plausible (or realistic) innovative idea can be detected in the development of the work, conclusions, or future work proposals derived from the BFP | - There can be detected in the development of the work, conclusions, or future work proposals derived the BFP various aspects and innovative ideas of great interest, consistent and plausible (realistic) | |

Table 6. Rubric for assessment of BFP to be used by the tribunal

Please cite as:

Hernández-Leo, D., Moreno, V., Camps, I., (2012) Teacher's guide to monitoring and assessment for Bachelors Final Projects. Teaching Quality and Innovation Support Unit, Polytechnic School, Universitat Pompeu Fabra, Barcelona.

Derived from the work done in several teaching innovation projects (E/A2011-0088, PlaQUID2010) http://www.usquidesup.upf.edu/en/proyectos

The authors would like to thank the project members and the UPF professors participating in the pilots for their support and ideas and, especially, Enric Peig and Miquel Oliver for their contributions and comments to earlier drafts of this guide.





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