

Advanced Engineering Project

Code: 102718
ECTS Credits: 12

Degree	Type	Year	Semester
2500895 Electronic Engineering for Telecommunication	OT	4	0

The proposed teaching and assessment methodology that appear in the guide may be subject to changes as a result of the restrictions to face-to-face class attendance imposed by the health authorities.

Contact

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Use of Languages

Principal working language: catalan (cat)
Some groups entirely in English: No
Some groups entirely in Catalan: Yes
Some groups entirely in Spanish: No

Prerequisites

To enroll in the Advanced Engineering Project (PAE) course, the student must meet the following requirements (in general):

- Have all the credits of basic education subjects (Calculation, Algebra, Statistics, Physics, Fundamentals of Computing, Foundations of Signals and Systems, Circuit Theory, Organization and Management of Companies and Foundations of Engineering), that suppose a total of 63 ECTS credits.
- Have at least 70% of the credits of compulsory subjects in the first three years, which represent a total of 73 ECTS credits.
- In total, the student must have passed $63 + 73 = 136$ ECTS credits.

Enrolment

The subject of the PAE is a special subject not included in the application of automation, and as such, its registration must be done manually once started the semester, within the period of modification of registration established in the administrative calendar of the School (September / October for the 1st semester, and February / March for the 2nd semester). Before enrollment, the student must request authorization by filling in the form available at TFG module at the Campus Virtual. Only when the authorization has been granted, the student can go to the Academic Management of the School to formalize the enrollment.

Objectives and Contextualisation

The objective of this subject is to develop an advanced engineering project where students can apply and integrate the knowledge and skills acquired throughout their Degree in Telecommunication Systems Engineering. The project will be carried out in collaboration with a professor / researcher attached to a research group, institute or research center that is part of the UAB sphere.

Competences

- Communication
- Develop personal attitude.
- Develop personal work habits.

- Develop thinking habits.
- Draft, develop and sign projects in the field of telecommunications engineering designed to conceive, develop or exploit electronic systems
- Learn new methods and technologies, building on basic technological knowledge, to be able to adapt to new situations.
- Resolve problems with initiative and creativity. Make decisions. Communicate and transmit knowledge, skills and abilities, in awareness of the ethical and professional responsibilities involved in a telecommunications engineers work.
- Work in a team.

Learning Outcomes

1. Apply the appropriate methodology to develop a problem, combining theoretical development and simulations as appropriate.
2. Communicate efficiently, orally and in writing, knowledge, results and skills, both professionally and to non-expert audiences.
3. Develop critical thinking and reasoning.
4. Develop curiosity and creativity.
5. Develop independent learning strategies.
6. Develop scientific thinking.
7. Develop systemic thinking.
8. Develop the capacity for analysis and synthesis.
9. Evaluate project results and compare them with similar results from external sources and identify new contributions by the project to current knowledge on the subject.
10. Evaluate the discrepancies between the objectives and the planning of a project, identify the causes of the discrepancies and adopt the necessary corrective measures.
11. Generate innovative and competitive proposals in professional activity.
12. Identify the specific objectives of the project
13. Maintain a proactive and dynamic attitude with regard to ones own professional career, personal growth and continuing education. Have the will to overcome difficulties.
14. Manage available time and resources. Work in an organised manner.
15. Manage information by critically incorporating the innovations of ones professional field, and analysing future trends.
16. Plan a project using a Gantt chart
17. Prevent and solve problems.
18. Search, tackle and expose different alternatives emphasizing their importance and risks in relation to project implementation.
19. Synthesize information obtained and ones own knowledge in a structured overview of the state of the art of the project matter.
20. Work autonomously.
21. Work cooperatively.

Content

They will depend in each case, on the concrete project that is carried out.

Methodology

Academic direction and tutoring of the PAE

Any student who attends the PAE subject will be assigned a Tutor that will ensure that the project meets their academic objectives, and a Director who will be the one who will direct the student during the realization of the project. The student's tutor will be responsible for the subject of PAE (which by default will be the Coordinator of the degree), while the Director will be the person in charge of directing the work of the student to the research group, institute or the corresponding research center.

The Tutor's obligations are:

- To ensure, as the highest academic leader, the quality of work and the fulfillment of the academic and teaching requirements of an advanced project in Telecommunication Systems Engineering.
- Apply the teaching guide of the subject of PAE.
- Participate in the assessment of the tutored student.

The obligations of the Director and Co-Directors are:

- Propose a job that meets the academic and teaching requirements for an advanced project in Telecommunication Systems Engineering.
- Help the student to delimit the work to carry out the term and establish realistic goals, setting a calendar and a good working pace.
- Advise and guide the student during the school year in which he has enrolled in the subject of PAE. This monitoring will be carried out periodically through tutorial sessions, in order to ensure that the established goals are achieved.

In case the PAE is directed by more than one professor / researcher, only one of them will act as Director while the rest will be considered co-Directors.

Compatibilities

The subject of PAE will be able to be enrolled by the student with the aim of extending the dedication to the TFG. In this case:

- The director of the TFG must give the approval, depending on whether he considers that the proposed TFG has sufficient entity to be carried out in an expanded manner.
- The TFG to be developed must have a specific work plan that includes an equivalent total commitment for the student of 24 ECTS credits. At the level of the academic record of the student, these 24 ECTS credits will be recorded according to the syllabus, such as 12 ECTS credits of TFG plus 12 ECTS credits of PAE.
- In the event that the Director is a professor of the School with assigned teaching assignments to the TFG, the Director will also act as a Tutor of the student.

Incompatibilities

The subject of PAE is incompatible with the subject of "Pràctiques Externes", and therefore, the student will only be able to enroll one of these two subjects.

Activities

Title	Hours	ECTS	Learning Outcomes
Type: Supervised			
Guidance	50	2	1, 9, 10, 18, 2, 6, 7, 5, 8, 4, 3, 11, 14, 15, 12, 13, 16, 17, 19, 21, 20
Type: Autonomous			
Development of the Advanced Project	240	9.6	1, 9, 10, 18, 2, 6, 7, 5, 8, 4, 3, 11, 14, 15, 12, 13, 16, 17, 19, 21, 20
Report writing	10	0.4	1, 9, 10, 18, 2, 6, 7, 5, 8, 4, 3, 11, 14, 15, 12, 13, 16, 17, 19, 21, 20

Assessment

- The PAE assessment will follow the same criteria as the evaluation of the TFG.
- The TFG committee will assess the work done by the student in a global way, taking into account a reference dedication of 24 ECTS credits.
- The committee shall issue a single grade that shall be recorded equally to the acts of the subject of PAE and TFG.
- If the Director of the PAE is a teacher of the School with teaching assigned to the subject of TFG, the Director will also act as a Tutor of the PAE.

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Evaluation of the Committee	40%	0	0	1, 9, 10, 18, 2, 6, 7, 5, 8, 4, 3, 11, 14, 15, 12, 13, 16, 17, 19, 21, 20
Oral presentation and defense	20%	0	0	1, 9, 10, 18, 2, 6, 7, 5, 8, 4, 3, 11, 14, 15, 12, 13, 16, 17, 19, 21, 20
Report of the work	20%	0	0	1, 9, 10, 18, 2, 6, 7, 5, 8, 4, 3, 11, 14, 15, 12, 13, 16, 17, 19, 21, 20
report of the supervisor	20%	0	0	1, 9, 10, 18, 2, 6, 7, 5, 8, 4, 3, 11, 14, 15, 12, 13, 16, 17, 19, 21, 20

Bibliography

In each case, the Project Director of the student will propose the appropriate bibliography based on the work to be done.