

Advanced Engineering Project

Code: 102701
ECTS Credits: 12

Degree	Type	Year	Semester
2500898 Telecommunication Systems Engineering	OT	4	0

Contact

Name: Antoni Morell Perez
Email: Antoni.Morell@uab.cat

Use of Languages

Principal working language: catalan (cat)
Some groups entirely in English: Yes
Some groups entirely in Catalan: Yes
Some groups entirely in Spanish: Yes

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 (<https://goo.gl/Nfqjy0>) and sending it by email to the person in charge of the subject. 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 ethics and professionalism.
- Develop personal attitude.
- Develop personal work habits.

- Develop thinking habits.
- Draft, develop and sign projects in the field of telecommunications engineering that, depending on the speciality, are aimed at the conception, development or exploitation of telecommunication and electronic networks, services and applications.
- 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. Adapt to unforeseen situations.
2. Apply the ideal methodology to develop the problem, combining theoretical developments and simulations as required.
3. Assume and respect the role of the different members of a team, as well as the different levels of dependency in the team.
4. Assume social, ethical, professional and legal responsibility, if applicable, derived from professional exercise.
5. Communicate efficiently, orally and in writing, knowledge, results and skills, both professionally and to non-expert audiences.
6. Critically evaluate the work done.
7. Develop critical thinking and reasoning.
8. Develop curiosity and creativity.
9. Develop independent learning strategies.
10. Develop systemic thinking.
11. Develop the capacity for analysis and synthesis.
12. Efficiently use ICT for the communication and transmission of ideas and results.
13. Evaluate discrepancies between the objectives and planning of the project, identify the causes of these discrepancies and adopt the necessary corrective measures.
14. Evaluate the results of the project comparing them with similar results from external sources and identifying the new contributions made by the project to current knowledge about the subject.
15. Generate innovative and competitive proposals in professional activity.
16. Identify the specific aims of the project.
17. Maintain a proactive and dynamic attitude with regard to ones own professional career, personal growth and continuing education. Have the will to overcome difficulties.
18. Make ones own decisions.
19. Manage available time and resources.
20. Plan a project using a Gantt chart.
21. Prevent and solve problems.
22. Seek, pose and expose different alternatives highlighting the importance and risk in relation to the execution of the project.
23. Synthesise the information obtained and ones own knowledge in a structured overview of the state of the art of the projects subject.
24. Work autonomously.
25. Work cooperatively.
26. Work in complex or uncertain surroundings and with limited resources.

Content

They will depend on each case, of the specific 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			
Follow-up meetings	50	2	2, 6, 14, 13, 22, 5, 15, 16, 20, 23
Type: Autonomous			
Development of the Advanced Project	240	9.6	1, 2, 4, 6, 14, 13, 22, 10, 9, 11, 8, 7, 15, 19, 16, 17, 20, 18, 21, 23, 24, 26
Drafting of the Report	10	0.4	4, 6, 14, 13, 22, 5, 12, 15, 16, 17, 20, 23

Assessment

There are two types of assessment in the subject of PAE:

Individual assessment

In case the subject has been enrolled as an individual optional subject (that is, without any other link with other optional subjects), the assessment will be the responsibility of the person in charge of the subject and the student's tutor, based on three elements:

- Report of the Student Director (50%), where the Director will show the evaluation of the tasks carried out by the student and the results obtained in the framework of the project.
- Student report (40%), where it will show a detailed description of the work plan, the development of the same, the degree of fulfillment of the objectives set, and the results obtained.
- Assessment of the Tutor (10%), based on student follow-up and the overall assessment of the results obtained.

Joint evaluation PAE + TFG

In the event that the PAE subject is carried out as an extension of the TFG, the student must inform the TFG committee, so that PAE can be evaluated jointly with the TFG. In this case:

- 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
Director's report	50%	0	0	14, 13, 16
Student's report	40%	0	0	1, 2, 4, 6, 14, 13, 22, 5, 10, 9, 11, 8, 7, 12, 15, 19, 16, 17, 20, 18, 21, 23, 24, 26
Tutor assessment	10%	0	0	3, 14, 13, 25

Bibliography

In each case, the student's Project Director will propose the timely bibliography according to the work to be carried out.