



IDENTIFYING DATA

Projects Lab

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|-------------------|--|-----------|------|------------|
| Subject | Projects Lab | | | |
| Code | V05G300V01802 | | | |
| Study programme | Degree in Telecommunications Technologies Engineering | | | |
| Descriptors | ECTS Credits | Choose | Year | Quadmester |
| | 12 | Mandatory | 4th | 2nd |
| Teaching language | Spanish Galician English | | | |
| Department | Telematics Engineering Electronics Technology Signal Theory and Communications | | | |
| Coordinator | Caeiro Rodríguez, Manuel | | | |
| Lecturers | Alba Castro, José Luis Álvarez Sabucedo, Luis Modesto Anido Rifón, Luis Eulogio Caeiro Rodríguez, Manuel Cardenal López, Antonio José Díaz Otero, Francisco Javier Eguizábal Gándara, Luis Eduardo Fernández Masaguer, Francisco Fernández Vilas, Ana Gómez Yepes, Alejandro González Valdés, Borja Llamas Nistal, Martín Lorenzo Rodríguez, María Edita de Machado Domínguez, Fernando Martín Herrero, Julio Prol Rodríguez, Miguel Raña García, Herminio José Rodríguez Rodríguez, José Luis Rodríguez Vaqueiro, Yolanda Sánchez Real, Francisco Javier Santos Gago, Juan Manuel Torres Guijarro, María Soledad Valdés Peña, María Dolores | | | |
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General description Interdisciplinary projects must be addressed by a team of students who must represent at least two of the four technologies of the Telecommunication Technologies Engineering Degree. The teams are supervised by two faculty members from different Departments to enrich and facilitate the cross-fertilization between different areas of work.

The work developed by the different teams will be defended at the end of the course as part of the evaluation process.

The teaching language is Spanish, Galician or English.

Competencies

| | |
|------|--|
| Code | |
| B1 | CG1: The ability to write, develop and sign projects in the field of Telecommunication Engineering, according to the knowledge acquired as considered in section 5 of this Law, the conception and development or operation of networks, services and applications of Telecommunication and Electronics. |

| | |
|-----|---|
| B4 | CG4: The ability to solve problems with initiative, to make creative decisions and to communicate and transmit knowledge and skills, understanding the ethical and professional responsibility of the Technical Telecommunication Engineer activity. |
| B6 | CG6: The aptitude to manage mandatory specifications, procedures and laws. |
| B7 | CG7: The ability to analyze and assess the social and environmental impact of technical solutions. |
| B8 | CG8: To know and apply basic elements of economics and human resources management, project organization and planning, as well as the legislation, regulation and standarization in Telecommunications. |
| B9 | CG9: The ability to work in multidisciplinary groups in a Multilanguage environment and to communicate, in writing and orally, knowledge, procedures, results and ideas related with Telecommunications and Electronics. |
| B11 | CG11 To approach a new problem considering first the essential and then the secondary aspects |
| B12 | CG12 The development of discussion ability about technical subjects |
| C54 | (CE54/PY1) The ability to elaborate the proposal of technical projects according to the specified requirements in a public competitive bidding. |
| C55 | (CE55/PY2) The ability for technical direction of telecommunication project. |
| C56 | (CE56/PY3) The ability to manage telecommunication project human resources and economic. |
| C57 | (CE57/PY4) The ability to elaborate technical reports and for the follow up of a telecommunication project. |
| D1 | CT1 Development of sufficient autonomy to carry out works within the area of Telecommunications in interdisciplinary contexts. |
| D2 | CT2 Understanding Engineering within a framework of sustainable development. |
| D4 | CT4 Encourage cooperative work, and skills like communication, organization, planning and acceptance of responsibility in a multilingual and multidisciplinary work environment, which promotes education for equality, peace and respect for fundamental rights. |

Learning outcomes

| Expected results from this subject | Training and Learning Results | | |
|---|--|-------------------|----------|
| Learn to work in group in a medium term project | B1 B4 B6 B8 B9 B11 B12 | C54 C56 C57 | D4 |
| Plan the development of a team project | B9 B11 | C55 C56 C57 | D4 |
| Integrate the required skills in a multidisciplinary team | B4 B9 B12 | C56 | D1 D4 |
| Keep a dynamic attitude and foster an on-going improvement effort | B1 B4 B7 B9 | | D1 D2 |

Contents

| Topic | |
|----------------------|---|
| Team work | The contents for each team will be specific of the project developed. In any case, they will be multidisciplinary contents. As an example, in the school web page is available the list of projects developed in previous years. See at http://teleco.uvigo.es/index.php/es/estudios/gett/planificacion-academica/lpro |
| Technical edition | Executive report Stages in report development |
| Project development | Introduction to project development methodologies such as, Design Thinking, Lean and Agile, where key principles are introduced: focus on the final user, rapid prototyping, to provide value to the client from the beginning, communication, etc. |
| Public presentations | Key elements in a presentation. Hints to perform an effective presentation. How to prepare a good presentation: <ul style="list-style-type: none"> - Strategy - Structure - Examples - Issues to take into account |

Planning

| | Class hours | Hours outside the classroom | Total hours |
|--|-------------|-----------------------------|-------------|
| | | | |

| | | | |
|-------------------------|----|-----|-----|
| Introductory activities | 2 | 0 | 2 |
| Classroom jobs | 4 | 4 | 8 |
| Project based learning | 14 | 244 | 258 |
| Presentation | 8 | 24 | 32 |

*The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.

Methodologies

| | Description |
|-------------------------|---|
| Introductory activities | Some practical hints on skills such as oral and written presentation, and team working. This activity is individual. Competences CT1, CT2 and CT4 are developed here. |
| Classroom jobs | Partial review of the different projects evolution, with short presentations and discussions. This is a group activity. Competences CG9, CG11 and CG12 are developed here. |
| Project based learning | This is the core of the course: the team of students must address a project, either proposed by them or by two faculty members. During the duration of the course the team members must work in close cooperation to achieve the objectives of the project; the supervision is such that a weekly one hour meeting will take place with one or both advisors. It is recommended the creation of a web site, such as a wiki, blog or similar, for each team to document and show the works developed during the term. All members of the team must be able to defend its project at the end of the course in both oral and two public poster sessions. This is a group activity. Competences CG1, CG4, CG6, CG7, CG8, CG9, CG11, CG12, CE54, CE55, CE56 and CE57 are developed here. |
| Presentation | Every team must defend its project in a final oral presentation and in two poster sessions, known as LPRO DAYS. The oral presentation can be made by one or more members of the team, and must include evidences to show proof of the work developed and achieved results. At the end of the presentation all members must be available for Q&A. The poster sessions require the presence of all members of the team. A summary of the work must be submitted to the evaluation committee three days in advance. This is a group activity. Competences CG9 and CG12 are developed here. |

Personalized attention

| Methodologies | Description |
|-------------------------|---|
| Introductory activities | Subject teachers will be available during tutoring hours to solve any doubts and issues about these activities. Teachers will establish timetables for this purpose at the beginning of the term. |
| Project based learning | Each team will have the support of their tutors for the development of the project and to solve any doubts and issues about it in tutoring hours. Teachers will establish timetables for this purpose at the beginning of the term. |
| Classroom jobs | Subject teachers will be available to solve any doubts and issues about the development of these tasks during tutoring hours. Teachers will establish timetables for this purpose at the beginning of the term. |

Assessment

| Description | Qualification | Training and Learning Results |
|------------------------|--|--|
| Project based learning | A portion of the final grade will be based on: 1. Advisors recommendations. For an adequate tracking of the project development, advisors will request different pieces of evidence, both oral and/or written, including partial and/or final reports. Each pair of advisors must submit a justified recommendation to the committee as to the team work methodology and the performance of the team members in the accomplishment of the project goals. Although the grade is expected to be similar for the entire group as a general principle, exceptions might apply. Competences CG1, CG4, CG6, CG7, CG8, CG11, CG12, CE54, CE55, CE56, CE57 will be evaluated here. 2. Group mates. Although the grade is expected to be similar for the entire group as a general principle, exceptions might apply. A peer review among the team members will be also requested as additional evidence for competences CG9, CT1, CT4. | 65 B1 C54 D1 B4 C55 D4 B6 C56 B7 C57 B8 B9 B11 B12 |

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| Presentation | A portion of the final grade will be based on the committee evaluation during the LPRO DAYS. The attendance to these days will be mandatory for all students. They must submit an executive summary of the project at least three days in advance to help assess their work. This part of the assessment will be made taking into account the summary of the project, the presentation, the poster and the work performed during the LPRO DAYS. The members of the evaluation committee will be the instructors of the Type-A ECTS, as long as they are not involved in the supervision of any project. Otherwise, additional assistance for the evaluation of those conflicting projects will be requested from other instructors from the course. Although the grade is expected to be similar for the entire group as a general principle, exceptions might apply. Thus, especially underperforming students not contributing to the team effort can get a different grade. Similarly, students contributing well above the average of the group can get a higher grade. | 35 | B1 B7 B9 B12 | D2 |
|--------------|---|----|-----------------------|----|

Other comments on the Evaluation

The first call evaluation is carried out in accordance to the previously mentioned, Presentation and Teaching based learning projects. It is mandatory the attendance to the 80% of the face to face sessions during the term, both in type-A and Type-C academic activities. Final presentations are allowed in Galician, Spanish or English. In any case, those students that decide to take the course in English should participate always in the English activities.

Those students/teams not getting the minimum grade to pass the course in the first call will have some additional weeks till the allocated date in the second call and extraordinary call to present the project again. In this second call, the individual learner will need to show a comprehensive domain of the project developed by his/her team, together with sufficient additional contributions of his/her own.

Sources of information

Basic Bibliography

Eric Ries, **El método Lean Startup: Cómo crear empresas de éxito utilizando la Innovación Continua**, 1, Deusto, 2011

Ken Beck y colegas, **Manifiesto por el Desarrollo Ágil de Software**, 1, 2001

Complementary Bibliography

Jim Highsmith e Ken schwaber, **Lean Software Development. An Agile Toolkit**, 1, Addison Wesley, 2003

Recommendations

Subjects that are recommended to be taken simultaneously

Technology Management/V05G300V01801

Other comments

This subject involves a high workload for the students outside of the classrooms related to the development of the projects: 244 hours. This effort is not just required individually, but also for the team as a joint group. In addition, it is important to have time availability to maintain meetings and perform group activities. Therefore, it is highly recommended to take this subject just with the subjects included in the second semester of the fourth year (DTEC and TFG) or equivalent. It is recommended to inform about subjects of other courses taken simultaneously with LPRO.

The work teams of this subject are multidisciplinary taking into account the 4 specializations of the degree. As a generic rule, if possible, teams cannot involve more than 3 students of the same specialization and students of 3 different specializations will be involved.