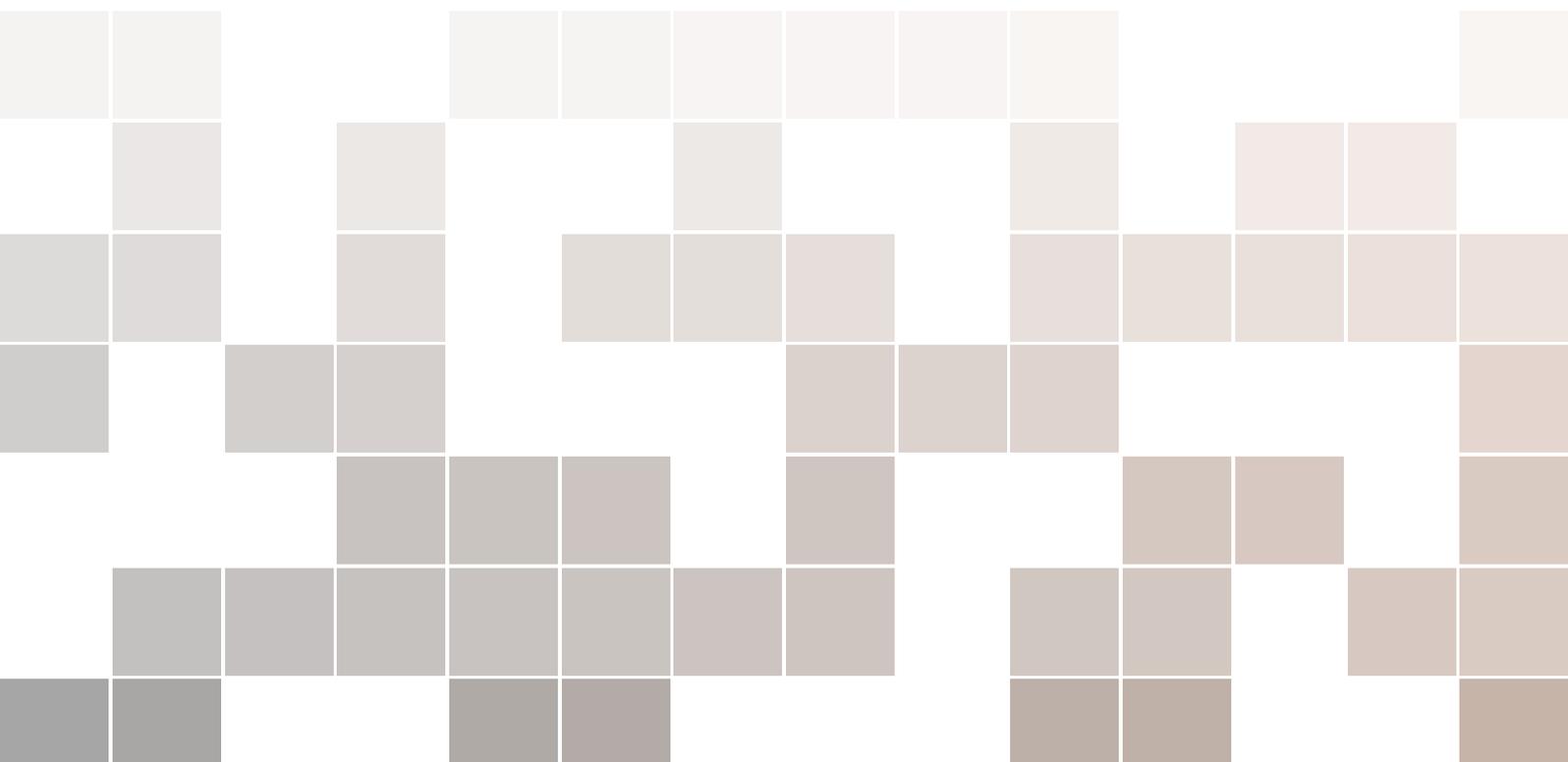


Student Handbook

School of Telecommunication Engineering

Academic year 2020/21



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New Students

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1. Welcome, Class of 2024!

Welcome to the EET! I'm delighted to share with you some personal observations about the best ways to take advantage of the opportunities for learning and personal growth that this College offers. First, remember that you are here to learn. You have the extraordinary luxury of four years in which to develop your mind—to grow in your ability to think analytically and read critically, to write clearly and speak persuasively, to develop and test hypotheses, and to fashion and sustain convincing interpretations or proofs. Enjoy this learning to the fullest. Master your courses and, later, your field of concentration, because the work engages your imagination and interest and expands your intellectual horizons. Resist outside pressures to choose areas of study on the basis of presumed practical utility. Your choices ought to be guided by your own intellectual passion and curiosity. Take full advantage of the special commitment of the UVigo faculty to undergraduate and graduate education. Go see your teachers during their office hours, whether to pursue a question left unresolved in class, or to ask for special help, or to seek advice about future studies. Do not be discouraged if a particular subject or course seems hard. Learning is a long-term endeavor.

Finally, never underestimate the importance of learning outside the classroom. That learning comes from getting to know other people—roommates, friends, residential college advisers, your deans and college administrators, and many other hard-working members of the community. It comes from participating in extracurricular activities and community service. It comes from attending the many intellectual and cultural events in your residential college and in the larger University. Make time for all of these kinds of learning, for they will enrich your experience here in ways that you will value for the rest of your life.

I wish you all the best for a wonderful year.

Íñigo Cuiñas, Dean of the College



2. Academic Organization

As a first-year student, you must follow a fixed set of subjects which belong to the approved curriculum for undergraduates. These subjects cover a wide range of scientific principles which together lay the foundations of the core engineering subjects in the following years. Thus, do not understate the importance of the general subjects planned for this first year, since they sharpen your ability to think analytically by using sound ideas from many different scientific fields. Working with abstract models and being able to use an analytical approach to solve problems are essential features of the engineering profession.

Academic Calendar

The academic year is divided into two terms, the fall term (or first term) from September 21, 2020 to January 27, 2021; and the winter/spring term (or second term) from February, 1 to May, 31 2021. As a general premise, a subject is offered only once a year, in its term.

Each term has 14 weeks of lectures and 13 weeks for lab sessions. After the lecturing period, a two week examination period starts. A copy of the academic calendar for the year 2020/21 is included in this document in page 64. The dates in the academic calendar—in particular, the exam dates—are firm and will not be changed under any situation.

Classes

The subjects unfold in the classrooms and laboratories. Every subject consists of 28 hours of lectures along the term and 28 hours of practice or experimental work in the labs.¹ **You are expected to attend all the lectures and practical sessions**, though attendance is not mandatory. Note that absence to a lecture or recitation could affect your grade, depending on the instructor's policy—check carefully the academic guide of each subject. But, more importantly, failing a lecture or recitation means that some important concepts, examples and time for discussion with the instructors are missed. This is very valuable information for developing a deep understanding and having a successful academic progress.

¹Except for Calculus I and Algebra, which have 42 hours for lectures and 14 for problem-solving sessions.

Usually, the lectures are given at a fast pace, this is one of the most striking differences between the university and your former high-school years. Get used to it as soon as possible. The details of many results, computations or assumptions are left to you, and you should complete those as part of your regular homework. There are excellent books and other educational resources from where you can learn by yourself, use them all or ask the faculty for advice.

Lectures last for one or two hours, depending on their specific schedule. There is normally a short break in the midst of the two-hour lectures. The lecture style combines dissertation by the faculty, blackboard examples, and projection of slides. Please, note that the slides are only supplemental material. They illustrate concepts, highlight the main ideas or summarize the conclusions, but the slides are not intended to be the authoritative and complete content of the subject. You will need to know more. All the materials used in the class are available to the students in **FaiTIC**, the online learning platform of UVigo.

Lectures are given in Spanish and/or Galician languages. In contrast, a large part of the support materials used in the class or for personal work —books, slides, presentations, problem sets— may be in English. Therefore, improve your reading comprehension of English but do not fear, technical English is quite easy after all.

Keep your manners when you attend a lecture or lab: don't be late, don't speak loudly, turn off or silence your cellular phone, and don't get in with food or beverages, if possible. Taking pictures or videos with smartphones is strictly prohibited. In the labs, handle carefully the computers and instruments: they are for all of you.

Appointment & Office Hours

The faculty reserves a number of hours weekly for assisting the students enrolled in their subjects. It is your privilege to have the opportunity of asking directly to a professor about some obscure topic or about how to best understand a concept. Feel free to go for help to your teacher at these office hours. To use the office hours just the eve of an exam is a sign of poor organization of your time. And maybe of laziness too.

For direct questions not requiring a long answer nor explanation, contacting a professor by email is also appropriate. Most of them will try to reply quickly, but you should understand that the faculty has other kind of duties related to research and management, so immediate response is not always possible. When you write an email, be sure to be clear about what you want and identify yourself providing enough information (full name, class, subject, etc.) It is extremely unpleasant to be contacted by a ghost. We encourage the use of the institutional email address (that is, `name@uvigo.es`) when contacting any person of the School.

Timetables

Your timetable for the lectures depends on the assignment decided by the School's officers. There are **four groups** for first-year students: 1^oA, 1^oB, 1^oC, and 1^oD. You will be informed about your specific lecture and lab groups before the start of the semester. The officially approved timetables can be accessed at [this page](#). The lecture times are denoted with capital letters in the subject acronym, e.g. ALG for **Linear Algebra**. A complete list of the subjects, their acronyms and their scope is included in this guide, in the Subject Catalog (in page 43).

The lab sessions (“B groups”) are given in small groups of students, around 20. Consequently, there are multiple practical/lab sessions scheduled for the same subject. In the official timetable, these are denoted as `alg B04`, for instance; that is, with the subject acronym followed by a space and a symbol.

The enrollment in the B groups is centrally decided by the responsible for academic organization, `teleco.subdiracademica@uvigo.es`. To check your specific groups and timetable, please login

into <http://quendasteleco.uvigo.es> and get the information.

Assessment & Exams

Any student in a subject has two alternative paths towards his/her grade: continuous assessment and single assessment.

Continuous assessment refers to a process of steady, systematic supervision of your academic progress by the instructors. This is typically enforced by means of intermediate examinations, quizzes, laboratory exercises, essays or homework throughout the term. The final grade is then a weighted average of the grades collected in these individual tests. The continuous assessment may include a final written examination and, in this case, the exam cannot contribute more than 70% of the final grade.

Eventual assessment consists in answering a written exam at the end of the academic term. The exam grade is thus the student's grade.

You are free to choose between the two paths during the first days of a subject, but it is rarely allowed to switch to the other once the classes develop. Check the [academic guide](#) of the subjects for knowing more about the specific regulations of such respect.

Exams take place at the end of the term during a two week period.² In case of failing a subject, you are entitled to a second chance for passing. During July, a new examination period opens for all the subjects taken. The grade policy depends on the statement enclosed in the [academic guides](#). Remember that the examinations in July cannot be used for enhancing a previous grade in a passed subject.

Always come to an exam with your identity card, since you can be urged to show it. Exam papers are official documents, so writing with a pencil is not advisable. However, it is not banned.

The exam and subject grades are published through the online system [SEIX](#) (Secretaría Virtual). After three days —not less— the students have the right to review personally with the professors the correction to their exams, and discuss or clarify whatever respects. Should a student, after this review session, be still in strong disagreement with his/her grade, he/she can file a formal complaint and an application for a second opinion, and send it to the Department in charge of the subject so that other peers review the exam paper. Please, note that this is a safeguard, official process and should not be invoked unless strong evidence exists against a faculty member.

If a student is unable to attend a final exam because of illness or some similar serious reason, he/she can take the exam another day provided the reason has been proved. Partial exams in the continuous assessment methodology cannot be taken again, unless the academic guide allows for that explicitly.

The calendar for examinations can be found [here](#).

Academic Requirements

The University enforces a [minimum academic performance](#) for granting a degree:

- A first-year student must pass 12 ECTS at least if he/she is a full-time student, or a minimum of 6 ECTS for a part-time student.
- Those failing to satisfy the above requirement are granted permission to stay in the University, provided they pass at least 30 ECTS during the next academic year.

Not fulfilling these requirements implies dropout from the School. Upon any other unusual circumstances, an explicit request must be made to the University Chairman.

²Sometimes, in the fall term, the examination period is split by the Christmas holidays, but it's still two weeks.

Part-time students

Students having a job and recognized sportsmen can apply for part time enrollment, whose academic requirements are less strict.

The ECTS System

The **European Credit Transfer and Accumulation System** (ECTS) is an academic measurement system representing the student workload required to achieve the specified objectives of a study programme. The ECTS weighting for a module is a measure of the student input or workload required for that module, based on factors such as the number of contact hours, the number and length of written or verbally presented assessment exercises, class preparation and private study time, laboratory classes, examinations, clinical attendance, professional training placements, and so on as appropriate. There is no intrinsic relationship between the credit volume of a module and its level of difficulty. In our School, 1 ECTS unit is defined as up to 25 hours of student input, so a 30-credit term is designed to require 600-750 hours of student input including class contact time and assessments.

European Diploma Supplement

The **European Diploma Supplement** (SET) is a document accompanying the university degree that gives a detailed description of the nature, the level, the context, the subjects and the type of studies undergone by the holder. The SET has been conceived for making the validation of diplomas easier between European countries. It does not guarantee automatic validation, nor it is a substitute for a curriculum vitae either. All the students in the School **hold the right to ask the SET**.

English friendly courses

English is the franca lingua for science, engineering and technology, so much of the support material you will encounter in our courses —books, articles, presentations, reports, slides, quizzes, etc.— will be written in English. Even though many of the courses in the first, second and third year in the curriculum are not taught in English, you will see in our subject catalog the label *English friendly* attached to them. This means that the instructors in charge of the course would be willing to discuss in English with students during their office hours, in case the student is not a Spanish native speaker.

Services & Facilities

Academic Services

This office offers administrative support for all the procedures related to

- Admission and payment of fees
- Enrollment in an academic program: new, continuing or modified; part time/full time
- Transcripts
- Management of scholarships

Location: School of Mining Engineering, 1st floor.

Contact: teleco.minas.estudiosgrao@uvigo.es, T. 986 812101

Student Mentoring Program (PAT & MEET)

Experienced students aid newcomers to cope with the uncertain, academic or non-academic troubles that the freshmen and freshwomen may have to face.

Contact:

Dean for Student Mentoring: Artemio Mojón Ojea. Office A-504
teleco.pat@uvigo.es

Library

The library stores and catalogs a growing collection of books, handbooks, academic journals and magazines, and theses on every possible topic related to communications engineering. All the books recommended in a subject exist in the library for your own checking. The library also serves as a reading/study room. The library is open Monday to Friday, from 8.30am until 21.00pm.

Location: School of Telecommunications Engineering, main hall

Computer Rooms & WiFi Access

The School has a computer room (B005) with 15 desktop computers at free disposal for the students. The computers are installed with the most common software packages used in a variety of courses.

Location: Room B005, School of Telecommunications Engineering.

Students have access to the campus WiFi network personal, just using their university account name `.surname@alumnos.uvigo.es` which they receive upon enrollment. The access to the WiFi network covers all the classrooms, labs and common spaces in the School.

Students' Syndicate (DAAT)

The students' syndicate (Delegación de Alumnos de Teleco, DAAT) manages the affairs more directly related with the student life in the School, e.g., relationships with the Dean and other officers, representation in the academic boards and committees, guidance to new students, development of complementary cultural, sports or recreational activities, etc.

Location: School of Telecommunications Engineering, main entrance

Contact: daat@uvigo.es

News and information

The primary and most authoritative source of information about any academic matter is the School website, <http://teleco.uvigo.es>. Check regularly its contents, whether for timetables, scholarships, exam dates, ... General information concerning all the students is also distributed on an email list teleco-alu@listas.uvigo.es, so it is good practice to subscribe to the list. Finally, many news bits are spread with online social networks, Twitter (@EETelecoVigo) and Facebook.

Specific news about a subject are usually announced through FaiTIC: an email message is sent to all the students enrolled in the subject so as to inform about lectures, due dates and the like.

Job offers and practical information about job search can be obtained through the mailing list teleco-emprego@listas.uvigo.es

Online learning platform: FaiTIC

The University of Vigo runs an online platform for accessing the teaching materials in any subject you are enrolled in. It is called FaiTIC, and you can log in since the very first moment. Membership to FaiTIC is automatic every year after the payment of the academic fees. Just log in with your ID—D.N.I. number— and chosen password. In FaiTIC, all the subjects have an independent space where instructors put the teaching materials—slides, problem sets, homeworks, quizzes, practice exams— used during the course, so this will be your way to get all those documents. FaiTIC is a unified, central repository.

Ethics

The University is a place for study and criticism of ideas. It brings forth the freedom of thought and freedom of speech as one of its constituent values since its own inception, untied from control by other political, religious or government institutions. In other words, the University warrants to all its members—both scholars and students—the necessary freedom to explore, expand or refute any part of the human culture on the basis of analysis, discussion, contrast of opinion and rule of the reason.

It is not possible to develop this mission without a strict requirement of intellectual honesty. This means respect for the work of other colleagues (or classmates) and honest scrutiny of your own work. As a member of the University you take the commitment of respecting this tradition. Accordingly,

- You will not try to gain an unfair advantage to an examination, both inside or outside the examination room.
- You will not make any attempt to give assistance to a student in an examination.
- You will not claim another's work to be yours, either a written work, a computer program or a presentation, in part or as a whole.
- You will not use or reproduce another's work without permission and without explicit indication of its authorship.

Violation of these clauses may lead to investigation by the academic officials and to penalties in case you are found responsible.



3. The School

Mission Statement

The School's main objective is the pursuit of excellence in teaching and research in Engineering with the central aim of producing graduate engineers with a capacity for independent thought in problem solving and creative analysis & design. These graduate engineers will also be capable of communicating clearly and will have a sound understanding of the responsibility of a professional engineer in respect of his/her colleagues, profession, employer and the wider community. To achieve this, the School endeavours to:

- instil in students an enthusiasm for the theory, art and practice of Engineering;
- teach the engineering sciences and mathematics which underpin the subject areas of Engineering;
- demonstrate the application of these principles to the analysis, synthesis and design of engineering components and systems;
- foster the development of team working skills;
- encourage students to exercise critical judgement and develop the communication skills necessary to make written and oral presentations of their work;
- develop the capacity for life-long learning;
- instil in students a clear knowledge of their responsibilities as professional engineers.

The major elements of the educational approach are: 1) a solid grounding in basic mathematics and engineering science; 2) a broad syllabus in the early years; 3) challenging, high-level teaching in the later years, in both practical and theoretical aspects of engineering.

Structure & Governance

The University of Vigo is a complex body, a medium-size community of scholars (~ 1000), students (~ 18000) and service workers committed in high-quality teaching and research. It is also a self-governed organization, with its own norms, rules or obligations. It is helpful for you to grasp an outline of how the University and the School are internally organised, what its structure is, and

who rules about what.

A department is a set of professors specialized in a given area of study. Departments —their professors— are in charge of conducting teaching and research on their field. A Department may teach subjects in one or more colleges, and comes in different sizes —from 10 to more than 50 teachers. The Departments participating in our School are these

Dep. of Signal Theory & Communications
Address: School of Telecommunication Engineering
Contact: tsc.direccion@uvigo.es
Web: <http://www.tsc.uvigo.es>
Director: Prof. Inés García-Tuñón Blanca

Dep. of Applied Mathematics II
Address: School of Telecommunications Engineering
Contact: dept10@uvigo.es T. 986 812 158
Web: <http://www.dma.uvigo.es>
Director: Ignacio Bajo

Dep. of Telematics Engineering
Address: School of Telecommunications Engineering
Contact: det.direccion@uvigo.es
Web: <http://det.uvigo.es>
Director: Alberto Gil Solla

Dep. of Applied Physics
Address: School of Industrial Engineering
Contac: dept08@uvigo.es T. 986 814 070
Web: <http://dept08.webs.uvigo.es>
Director: Prof. Manuel Martínez Piñeiro

Dep. of Electronic Technology
Address: School of Industrial Engineering
Contact: dte@uvigo.es T. 986 812 163
Web: <http://dte.uvigo.es>
Director: Andrés A. Nogueiras Meléndez

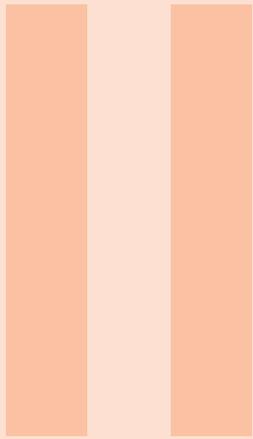
The School is led by the Dean, **Íñigo Cuiñas Gómez**. He is assisted by a number of academic officers

Vice Dean for Academic Affairs	Manuel Fernández Veiga
Vice Dean for International Exchange	Enrique Costa Montenegro
Vice Dean for Infrastructure and School Secretary	Miguel Á. Domínguez Gómez
Vice Dean for Academic Quality	Loreto Rodríguez Pardo
Vice Dean for External Affairs	Francisco J. Díaz Otero
Undergraduate Program Coordination	Rebeca P. Díaz Redondo
M. Eng. in Telecom. Engineering, Graduate Program Coordination	María José Moure Rodríguez
M. Eng. in Cybersecurity, Graduate Program Coordination	Ana Fernández Vilas

Most of the issues that affect the life in our School are discussed in boards, committees or councils before approval. The principal boards responsible for the governance are the **School Board** and the **Undergraduate Academic Board**. The former is a large board encompassing virtually every faculty member, plus a representation of the students and administrative staff. The UAB is a smaller committee formed by the Dean, the academic officers and the **academic area coordinators**, teachers in charge of coordinating a small set of related subjects, usually in the same course. The UAB is executive and dictates about any matter concerning the internal academic organization —timetables, calendars, classroom & lab use, etc.—, the students' requests —subject validations, students' claims, assignment of bachelor thesis—, and the School norms. The School Board meets regularly for discussing and eventually pass any regulations inherited from, or demanded by, the University authorities.

Facts & Figures

The School was established in 1985, the third in Spain by that time. The new building was opened in 1990, and the new classroom wing was finished in 2005. The faculty includes 120 teachers for 750 undergraduate students and 50 graduate students, approximately, a ratio of around 7:1 student-to-faculty. The School reached a maximum enrollment of nearly 1 700 by the end of the 90's. Among the faculty, more than 95% hold a Ph.D., and there are 25 full professors ("catedráticos"). Up to date, along the period 1985-2017, there have been about 3 000 egress students with the degree "Ingeniero de Telecomunicación", about 300 with the degree "Ingeniero Técnico de Telecomunicación" and around 400 "Graduado en Ingeniería de Tecnologías de Telecomunicación".



Current Students

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4. Academic Organization

Academic Calendar

The academic year is divided into two terms, the fall term (or first term) from September, 14 2020 to January, 22 2021; and the winter/spring term (or second term), from February, 1 to May, 31 2021. As a general premise, a subject is offered only once a year, in its term.

Each term has 14 weeks of lectures and 13 weeks for lab sessions. After the lecturing period, a two week examination period starts. A copy of the academic calendar for the year 2020/21 is included in this document in page 64. The dates in the academic calendar—in particular, the exam dates—are firm and will not be changed under any situation.

Enrollment constraints

Congratulations, you have passed to your second (or third year) but, sadly, you failed some subjects. You are eager to enroll in exciting new subjects and, hopefully, to squeeze your time and get rid of those bothering pending subjects. Well, sorry, that's not possible without some restrictions enforced by our School.

As a current full-time student, you must enroll in a **minimum of 48 ECTS**,¹ but must do it subject to the constraints contained in the dependence chart among subjects. A direct dependence in this chart means that those subjects ought to be taken simultaneously if you did not pass some of the predecessors. This is entirely for your benefit, since academic success is uncertain (at best) if you were allowed to enroll freely without sticking to the chart. So, the School limits your choices, but does so looking over the horizon. The chart is [here](#).

With the enrollment constraints in force, it might happen that the two academic terms end up unbalanced in your case, with significantly more subjects in one term and much less in the other. We have no stipulations for solving this issue, so it is up to you to cope with this. If you wish to know in advance which subjects better suit your situation, and plan a good prospect for the academic year to begin, just check this student guide and read the academic catalog.

¹You can extend the enrollment up to 84 ECTS. Read on.

Extending your enrollment

Even under the enrollment constraints, it is possible to take more than 60 ECTS in one academic year depending on your academic performance. The maximum number of credits allowed for a single academic year is listed in the following table

CREDITS PASSED THE PREVIOUS YEAR	MAX. CREDITS FOR ENROLLMENT
Less than 6	60
Between 6 and less than 24	66
Between 24 and less than 48	72
48 or more	78

Students who need less than 84 ECTS to finish the degree are allowed to take the full 84 credits in one year.

Classroom groups

For the academic year 2020/21, there will be two classroom groups for the 2nd and 3rd year subjects. **All the students must attend to the lecture and lab groups assigned by the School's officers.** No changes will be allowed. You will receive by the beginning of the semester the specific timetable for your classes.

Subjects in the second year follow the same structure as those in the first year: a 14 weeks schedule, with 4 hours of lectures and labs per subject in every week, except the first. Lectures are given in the classrooms, and practice sessions are given in the laboratory rooms, with a few exceptions. Attendance is not mandatory, but it is highly recommended. Please, read carefully the academic guides of the subjects you are enrolled in to be aware of the local rules in every subject.

Third year

The third year has a different structure, as you can expect after seeing the curriculum structure:

- In the first term, the students take two common subjects from the core engineering curriculum (*CEP, Programmable Electronic Circuits*; and *SINT, Internet Services*) and, simultaneously, three mandatory subjects from the Minor they have chosen.
- In the second term, the students take 5 new subjects from their minor track. These are compulsory.

The subjects offered in a minor have some new features compared to the common part of the curriculum, so it is important to grasp their new style:

- A subject in a minor has 42 hours in total, divided into 21 hours of type A, 14 hours of type B and 7 hours of type C. So, these subjects demand less time in classroom and/or labs, but not at all less work! On the contrary, you will discover that, in most cases, the time devoted to each subject is even higher than in previous years.
 - **Type A** hours are usually lectures in the classroom, given to a medium/large group of students. These are expository presentations of the material covered in the subject.
 - **Type B** hours are practice or experimental sessions taking place at the laboratory. These hours are usually employed to work on the implementation of a working (sub)system related to the subject contents. Here, at these hours, you will learn many useful, practical, contemporary computing tools used in the engineering profession, typically at an advanced level.
 - Subjects in the minors are project-oriented. This means that students are expected to demonstrate self-organization, independence and maturity to develop small-scale engineering projects supervised by the instructors. **Type C** hours are planned precisely for this guidance sessions, and for presenting the group projects at the end of the term.

The instructor will assign a practical project to a small group of students (5-7 people), and will supervise its development along the course.

Laboratory groups

Laboratory groups will be centrally arranged by the School officers. This is exceptional, and it is due to the requirement to enforce strict public health rules among faculty and students as a result of the covid-19 pandemic.

Timetables

Enrollment in the B groups —those corresponding to type B hours— is done during the first week of each term, through the online system `quendasteleco.uvigo.es`. The organization of C groups depends directly on the instructor of the subject. Notice that the timetables for the third year subjects follow a week-by-week structure, not a regular schedule as in the first and second years. This might seem annoying at first, but you should recall that type A, B and C hours are intertwined differently in different subjects, and this makes nearly impossible to propose a regular schedule for all your classes. Thus, it is extremely important that you plan carefully at the beginning of each term your personal timetable, choosing wisely when to attend to the subjects.

Do not consider the time between two classes as spare time or dead time. Instead, try to use it for working on the assigned projects or for studying the theoretical contents. Otherwise, the work will pile up quickly and soon you will be overwhelmed by the intermediate due dates in the subjects.

Since the teaching style is more focused on acquiring practical skills, some subjects may not have a final examination. However, note that this is not good or bad in itself, nor a recommendation. It depends strongly on the subject contents and on the instructor's preferences.

A note about how to read the timetables: capital letters refer to lectures, e.g., **SINT** for *Internet Services*. Lowercase acronyms refer to B groups for a subject. As usual there may be multiple B groups in a given subject, and these are distinguished by an underscore followed by a number, e.g., **sint B04**. Finally, C hours are denoted in the timetables in lowercase letters too, in the form **atr C04**, for instance. Again, there are multiple C groups (each has a different number as suffix) in a subject.

The second year

The second year contains almost all the subjects that form the core of the engineering curriculum: electronics, signal and systems theory, electromagnetics and data/network communications. For sure, these are a wide range of technical fields and it is perfectly normal for you to find some of them quite difficult: they are. But they are very rewarding, too, for you will learn the ultimate foundations of modern *and future* telecommunications systems. A good background on these topics is essential for any working engineer, not the least for facing the subjects in the following years.

As a practical advice, take these subjects seriously. They will provide you with knowledge that will be part of your culture for many years on. They establish the *common language of engineering*, the one that will enable you to work with other people from different parts of the world. Dismiss any thoughts about some of the subjects not being “useful”, or “uninteresting” for you, or “too theoretical”, especially when they come from small talk or rumors. Form your own opinion, follow your instinct.

In a loose sense, the subjects offered in the second year could be seen as an introduction to the minors that you will take further the next year. For many reasons, this is not an exact nor a helpful interpretation from a student's point of view. First, as said before, the second-year subjects are

common knowledge for all the engineers, irrespective of the subsequent minor chosen. As such, they cannot be considered as appetizers or teasers for the “real” engineering subjects to come later; more properly, they are engineering subjects in every respect. Second, the second-year subjects do not form a soft, gentle introduction to the ensuing specialization subjects or the problems addressed there. In some cases, the second-year subjects go deep into the science and technology enclosed in contemporary communications systems. This means that the approach is prominently abstract, since we need the right abstract models in order to fully understand how the systems work. Unfortunately, the conceptual models that have been developed for the different areas are disparate, and that’s part of the intellectual complexity you will have to face. You must accept that communications engineering is: 1) an old topic,² encompassing nowadays a vast amount of distilled knowledge about many fundamental problems that were solved by very smart people; 2) a complex *engineering* discipline, not an inspired art. That is to say, a science-based approach to solve problems. Third, while it is true that the core engineering subjects pave the way towards further specialization, their intent is not that of giving a glimpse of the topics covered there. In summary, the second-year subjects are not a shortcut to the final goal of becoming an engineer.

Given that, if you have some pending subjects from the first year, be warned that the second year can be very demanding in time and effort. To avoid eventual frustration and money expenditure, carefully analyze how many and which subjects you will enroll, since it is likely that the second year is not the term to recover your academic lag.

Assessment & Exams

Any student in a subject has two alternative paths towards his/her grade: continuous assessment and single assessment.

Continuous assessment refers to a process of steady, systematic supervision of your academic progress by the instructors. This is typically enforced by means of intermediate examinations, quizzes, lab exercises, essays or homework throughout the term. The final grade is then a weighted average of the grades collected in these individual tests. The continuous assessment may include a final written examination and, in this case, the exam cannot contribute more than 70% of the final grade.

Eventual assessment consists in answering a written exam at the end of the academic term. The exam grade is thus the student’s grade.

You are free to choose between the two paths during the first days of a subject, but it is rarely allowed to switch to the other once the classes develop. Check the [academic guide](#) of the subjects for knowing more about the specific regulations of such respect.

Exams take place at the end of the term during a two week period. In case of failing a subject, you are entitled to a second chance for passing. During July, a new examination period opens for all the subjects taken. The grade policy depends on the statement enclosed in the [academic guides](#). Remember that the examinations in July cannot be used for enhancing a previous grade in a passed subject.

Always come to an exam with your identity card, since you can be urged to show it. Exam papers are official documents, so writing with a pencil is not advisable. However, it is not banned.

The exam and subject grades are published through the online system [SEIX](#) (Secretaría Virtual). After three days —not less— the students have the right to review personally with the professors the correction to their exams, and discuss or clarify whatever respects. If, after this review session, a student is still in strong disagreement with his/her grade, a formal complaint and an application for a second opinion can be registered and sent to the Department in charge of the subject so that

²Well, at least older than you believe!

other peers review the exam paper. Please, note that this is a safeguard, official process and should not be invoked unless strong evidence exists against a faculty member.

If a student is unable to attend a final exam because of illness or some similar serious reason, he/she can take the exam another day provided the reason has been proved. Partial exams in the continuous assessment methodology cannot be taken again, unless the academic guide allows for that.

The calendar for examinations can be found [here](#).

Academic Requirements

The University enforces a **minimum academic performance** for granting a degree:

- A first-year student must pass 12 ECTS at least if he/she is a full-time student, or a minimum of 6 ECTS for a part-time student.
- Those failing to satisfy the above requirement are granted permission to stay in the University, provided they pass at least 30 ECTS during the next academic year.

Not fulfilling these requirements implies dropout from the School. Upon any other unusual circumstances, an explicit request must be made to the University Chairman.

English friendly courses

English is the franca lingua for science, engineering and technology, so much of the support material you will encounter in our courses —books, articles, presentations, reports, slides, quizzes, etc.— will be written in English. Even though many of the courses in the first, second and third year in the curriculum are taught in English, you will see in our subject catalog the label *English friendly* attached to them. This means that the instructors in charge of the course would be willing to discuss in English with students during their office hours, in case the student is not a Spanish native speaker.

5. Choosing a specialization

You are a second year student and soon you will face an important dilemma: according to my personal interests, academic performance and my desired professional career, what specialization (“mención”) should I choose? After all the hard times, you will probably want a dream job...

As you know, undergraduates may opt among four different specializations for their third and fourth years: **Telecommunications Systems**, **Sound & Image**, **Electronic Systems** and **Telematics**. So, let us begin with a brief presentation. But, after reading the facts, be selfish: resist outside pressures to choose areas of study on the basis of presumed practical utility. Your choices ought to be guided only by your own intellectual passion and curiosity.

What will I learn in specialization ...?

First of all, you must be willing to accept a bold statement: Telecommunications is about building, operating and exploiting better and cheaper communication devices, communication channels, and communications & information systems, for whatever purpose they could be applied. The diverse specializations or specialization tracks offered in our School mirror this definition, in that they are aligned with one or more of the broad areas just outlined. Moreover, the specialization tracks provide advanced knowledge and skills on devices, channels or systems. Certainly, this can only be accomplished with distinct conceptual models and intellectual tools.

Telecommunication Systems

A specialization in Telecommunication Systems will give you the technical background for understanding and undertaking the design of communication (sub)systems. This specialization is strongly based on signal theory, statistical processing and radiocommunications. After pursuing this specialization, you will be able to:

- Design the basic building blocks of a communication system, both in their hardware components and the sophisticated signal processing algorithms on which they rely: digital transmitters and receivers, equalizers and filters, signal detection and estimation devices, etc.
- Understand and design radio-frequency circuits that embody the above building blocks.

- Understand and apply fundamental electromagnetic principles for: designing antennas, characterizing radio/optical channels, knowing the physics of optical communications, and manage the electromagnetic spectrum.
- Describe and know how many communications systems work: point-to-point digital transmission systems, radio communication systems, cellular networks, optical communications systems.

If you have a taste for communications problems in the physical domain (time- and frequency-domain representation of fields, waves and signals), as well as for the low-level circuits for producing these signals and the symbolic algorithms used for manipulating the signals, then this specialization might be for you. Notice that while the problems addressed have mostly to do with the physical properties of channels and the matching of signals to them, the formal tools are ultimately highly abstract.

Sound & Image

A specialization in Sound & Image will make you a skilled expert about speech, audio, image and video transmission, processing and editing. You will learn here how to:

- Capture, digitalize, store and compress audiovisual signals efficiently. Also, the main standards for representing digitally such sort of information.
- Measure, characterize and shape noise and any kind of acoustic signals in different propagation media, e.g., air, water, buildings.
- Apply image enhancing techniques for detecting forms, shapes, contours or recognize objects.
- Enhance, filter, denoise or process speech and audio signals for automated speaker recognition or automated speech utterance.

If you like to delve into applied signal processing —e.g., medical imaging, remote sensing— and audiovisual machinery, then this specialization may suit to you. The requirements are basic signal processing tools. Recall that this specialization has no continuation in the Master program as an independent specialization track, so if you are planning to pursue the Master degree probably some extra work will be necessary.

Electronic systems

The specialization in Electronic Systems will prepare you as a fully skilled electronics engineer, a person who is trained to design, test and build all kinds of electronic subsystems, from power electronics, to sensors, analogue, digital or mixed electronic systems. Correspondingly, you will study under this track:

- Underlying physics and models of fundamental electronic and optoelectronic devices, sensors and actuators.
- Design of advanced electronic systems for sensing, automated control, embedded control, and communications.
- Digital system design: microprocessor-based systems, microcontrollers, integrated circuits.

If you like to get a deep understanding of the devices and circuits used for measure and process signals, for performing logic computations, or for supplying power then this specialization is your place.

Telematics

Transmission of information is the canonical problem of Telecommunications as a field of study. Communication networks are built by combining communication (sub)systems in increasingly complex interconnected patterns. Telematics addresses the study of the organization, design, operations and management of large information systems or networks, those in which information has also a meaning. After pursuing this specialization you will be trained to:

- Deeply understand how the Internet is built and how it works: switching and routing, architectural principles, protocols and standards for automated data exchange.
- Develop the middleware and the software that enables distributed information services on the Internet: web/mobile applications and services, database systems, operating systems, network algorithms, management software.
- Learn how the large Internet service providers build and market their global services, physically and logically: large-scale storage, computing and distribution of digital contents over the net.
- Design networks and calculate how many physical resources shall be installed for achieving a target performance.
- Configure and optimize all sorts of network equipment, from small network deployments to global telco solutions.

If your preferences lead you toward systems engineering and you feel comfortable with programming, Telematics will likely satisfy you. Telematics has points in common with a number of neighbor areas, like computer science, data science, software engineering and networking, so ability to cope with varied scientific approaches to a problem is a plus.

What to expect

Irrespective of the chosen specialization, the teaching style in the third year subjects is slightly different to those subjects that form the core of engineering. You will meet almost everywhere a project-oriented learning style, where your problem-solving skills are put under probation. Lectures are still an important part of teaching, but the goal is that students learn by doing themselves many small or medium-sized projects, either individually or in small groups. That is why three different group sizes exist: A for lectures, B for lab exercises or small projects, C for developing projects. Nonetheless, theory is worth its time too: engineering is not a trial-and-error endeavor, but rather a systematic and science-based approach to solve problems and design machines.

That said, most of the subjects embedded in a specialization put their focus on the professional practice, trying to teach real-world technologies, procedures and tools. Do not feel disappointed if there is not a comprehensive coverage of your preferred area of study, for that is hardly possible in one and a half year. Minors have the purpose of specialize your knowledge and give high-level skills, yet not to make you omniscient about every possible topic. That will be something to achieve by yourself along your future professional career. You will soon learn that communications technology becomes obsolete quite fast, and that it is basic principles what really lasts and gains value over time.

Keep in mind that the specialization you chose is an important decision toward your future career, but it is in no way definitive or irreversible. You can and probably will reshape your background and skills to work in a different area, and that's an enriching experience indeed. Simply open your mind and stay curious about any engineering area you wish to know more, and pursue a deep comprehension of it if you intend to make a living from it.

Electives

Not everyone has the same interests and preferences. That's why a part in your curriculum is flexible and can be adapted to some extent to your personal tastes. During the first term of the last year you can choose to take optional modules from a relatively large collection of topics. See the next chapter for further information.

The electives cover specialized training in topics already met in some of the compulsory subjects that form the specialization of your choice. If, in contrast, you would rather learn some new topic in a specialization different from yours, then that's possible too under certain conditions. Electives

are subjects that change rapidly in accordance to the evolution of this technology and the industry practices. A complete list can be found at the end of this guide, in the subject catalog.

Employability

Telecommunications technology is still one of the fastest growing technologies of our age. Graduates in Telecommunications Engineering are in a privileged position at the forefront of this field, contributing to the development of improved, new, green communication systems that will change the way whereby machines, computers and people exchange information.

Our recent undergraduates have gone on to become graduate engineers at UVigo and elsewhere, network service engineers, electronic engineers or radio engineers at nationwide and international companies.

6. The last year

The last year is special in many respects, not only for being the last before graduation. In this year, the students have multiple options for configuring a personalized path through the curriculum, so that, for instance, an initial experience on industry can be gained. There also exists the opportunity of studying abroad one term or the full year. And finally, the teaching style turns towards the development of engineering projects. Let us briefly explain all these novelties.

Structure

Perhaps it is better, for explaining the structure of the fourth year, to list the possible timelines, depending on the student's choices:

- **First term: only electives.** As a first possibility, the student may choose to take 5 new electives. These may be
 - The 5 electives offered within the pursued specialization.
 - The subjects offered in another specialization during the first term (therefore, up to three subjects). The remaining electives must come from the pool of electives in his/her specialization.
- **First term: electives and practicum.** A student may gain 6 or 12 ECTS by means of an internship/practicum period in the industry (see below for further information). The remaining credits until completion of the required 30 ECTS should be obtained with electives, in any of the combinations described in the previous point.
- **First term: study abroad.** After a selection process, some students are granted permission to study in a foreign university for the entire term. The student can enroll in any subject of his/her interest in the destination university, and the credits are immediately transferred back at the end of the term.
- **Second term: projects and bachelor thesis.** During the second term, the student is expected to take two special subjects, namely *Projects Laboratory* (12 ECTS) and *Project Management* (6 ECTS). Since the academic year, these two courses may be taken in English, and this fact will be duly reflected in the student's academic transfer. To choose the English versions of any of these courses, just mark the option during the enrollment. In addition, the student is

expected to complete a bachelor thesis under the supervision of some member of the faculty. See below for more information on the bachelor thesis.

- **Second term: study abroad.** In a few cases, permission is granted for staying abroad in a peer institution for the whole academic year. Presentation of the Bachelor Thesis at the host institution is optional. Only selected destinations comply with our curriculum, though. The host institution has to offer subjects similar to [Projects Laboratory](#), in particular.

Whatever the option a student takes, preparing and presenting a Bachelor Thesis is mandatory for all the students. Almost half of the second term is reserved for that purpose. Read the next chapter to get detailed information about the Bachelor Thesis.

Study abroad

The University of Vigo is a participating institution in a number of exchange programs for the benefit of undergraduate and graduate students. To list a few:

- Erasmus+ to European destinations
- UVigo scholarships
- Santander scholarships to Latin America
- SICUE (exchange to/from other Spanish universities)
- Erasmus Practicum (Europe)
- Erasmus+
- Vulcanus (Japan)
- ISEP (USA)

The official source of information about all these exchange programs can be found in

- *Office for International Relationships (ORI)*. Manages all the administrative procedures: dates, funding, calls, requirements, etc. Website: <http://internacional.uvigo.es>
- Vice Dean for Academic Organization. Students' Office. Jointly in charge of the SICUE Program. Website: http://estudiantes.uvigo.es/estudiantes_gl/siope/sicue
- Vice Dean for International Exchange (EET). In charge of academic intermediation, memorandum of understanding for exchanging students, etc. Website: <http://teleco.uvigo.es>, under Section "Alumnado", followed by "Programas de Movilidad"

In these websites you can find information about the possible host universities, the phases of the selection processes (call, open period for applications, admissions, selection, news), the documents and forms to be presented and any other related topic.

Note that, as a general premise, all exchange programs have limited places for students, so the requests are strictly ordered by academic record. In addition to that, the University and the School only award a scholarship for studying abroad if the student complies to the specific conditions enlisted in the call, which in turn may depend on the type of scholarship and the destination university. So, before applying, be sure to be eligible by reading carefully the requirements included in the call, the requirements enforced by the School, and the requirements of your preferred host university. For instance, to be a candidate in the Erasmus+ program (European student mobility) you will need at least 150 ECTS from the first three years at the moment of leaving.

The goal of the exchange programs is to foster the cultural interchange among European countries, building ties between students with different backgrounds, values and experiences. At the same time, you will know another culture and will master a foreign language. Despite this idillic outline, the academic part is important too: the stay is intended for continuing your studies in another institution, so you are expected to take and pass as many ECTS as those listed in you memorandum of understanding (a contract signed before your departure). In our local curriculum, the right time to embark in a stay is the first term, fourth year if you don't have some failed subjects from the previous years (well, or if you had only a few). Some host institutions (Grenoble, Lodz,

Saarbrücken) offer subjects similar in spirit to our *Projects Laboratory*, and could be chosen for a stay covering all the academic year. The number of vacancies is short, however. Obviously, for enjoying a scholarship and study abroad, you will need to demonstrate the required language skills in the language the subjects you intend to take are taught. Language ability can be proven in several ways: by presenting a widely recognized certificate, or by passing an examination in the Centro de Linguas—the examinations are regularly scheduled along the year. Our internal regulations in the School require a B1 level certificate. Please, note that the host university could require a higher level.

Internship & practicum

The last-year students may gain 6 or 12 ECTS doing a period of professional practice in the industry, as a substitute for elective subjects. The amount of credits awarded is the result of the time spent in the industry: 6 ECTS are recognized in exchange for 150 hours of work, whereas for 12 ECTS 240 hours are needed. Currently, the School has signed agreements for practicum periods with over 70 firms, so the general catalog is wide. Besides, the practicum comes in two different flavors:

- **Curricular practicum:** managed by the School.
- **Extracurricular practicum:** managed by UVigo (FEUGA, “Fundación Empresa-Universidade de Galicia”).

Curricular practicum admits students who have completed over 50% of the curriculum, and at least 4 mandatory subjects in their specialization. Moreover, the practicum has to be related to the pursued specialization. Upon fulfillment of those criteria, a student is allowed to do his/her practicum stay during the summer before his/her fourth year. In such case, the practicum is managed as an extracurricular practicum (thus, managed by UVigo) and transformed later into standard (curricular) practicum. Otherwise, the general offering for the curriculum practicum is usually announced in March-April; the call is open until May, and a preliminary list of candidates selected on the basis of its academic record is sent to the requesting firms; the firms select their preferred candidates. A second list of candidates is sent after the results of the examination period in May-June, and a final, third list is formed in July after the last examination period. Those who have been selected by a corporation can enroll formally in the subject *Prácticas en Empresa I* and *Prácticas en Empresa II* so as to get 6 or 12 ECTS, respectively.

If a host industry demands a practicum vacancy with more than 240 hours of expected work, the excess hours ought to be paid. Eventually, some practicums could continue and give rise to a bachelor thesis supervised by some corporate engineer. At least 150 hours extra are required to convert the work after the practicum into a bachelor thesis.¹

Extracurricular practicum is independently managed by FEUGA. A student willing to follow this type of practicum stage must have completed 50% of the curriculum.

Projects Laboratory

Projects Laboratory stands as a special subject in the curriculum, like no other one. It has been designed as the imitation of a real working environment where a small team of 5-6 students from different specializations, i.e., with diverse backgrounds, collaborate in designing the prototype of a real engineering system from scratch. The interdisciplinary approach is an essential feature of this subject, and that is why is so difficult to find a similar subject in other universities, with a close philosophy and team dynamics.

Working under the supervision of a pair of professors each, the teams work out the design, implementation, test and demonstration of their project. Usually, the final result gets very close

¹Note that at least 60 hours must be paid.

to a real product, except for the only remaining stages of production and marketing. Many of the projects are highly innovative and implementable. To put it differently, they are fun!

The projects are selected by the students **during the first term**, and actually start at the beginning of the second term. All the projects are finally **presented in public** during the so called **LPRO days**, an open event having an increasing impact on the media.

Project Management

Project Management is complementary to *Projects Laboratory*. In the real world, the engineering projects have strict time and economic constraints. A project may be perfectly arranged and solved from a technical standpoint, but it will fail if it is poorly or carelessly managed and organized in time, material resources, staff or planning. *Project Management* is a subject devoted to these matters, using a practical, case-study approach. Here, you will learn how to plan and execute projects correctly; how to lead and stimulate project teams effectively; and how to cope with unplanned changes to a perfect roadmap without having to return to the starting point.

Bachelor Thesis

All students undertake an independent engineering project that culminates in a dissertation. This dissertation ought to demonstrate comprehension, technical capability and critical thinking by the student. Read on the next chapter for a full explanation.

7. Bachelor's Thesis (aka TFG)

What is it?

An independent, individual and original work on an engineering project, required to all the students in their final year, during the second term.¹ The bachelor's thesis culminates in a dissertation of 1 500 words, approximately. The students must submit this dissertation for the consideration of an examining committee, and present their work in a public session.

How can I get mine?

There will be two periods for choosing a topic for the bachelor's thesis

- The regular period: the complete list of topics offered for doing the bachelor's thesis during the normal period is published in October. The students can request further information about the topics of their interest, and present an application. After all the applications have been processed, the assignment of topics to students is published by December. This means that, at the beginning of the second term, all the students know their topic and can start the work under the guidance of an academic supervisor.
- The late-term period: some students are not able to cope with the subjects and the bachelor's thesis simultaneously. Instead, they prefer to undertake the thesis during the first term following their fourth year. For these cases, a short period of offerings opens in June 2018.

The students can apply for one of the topics and do their thesis during the first term ensuing. The School guarantees that every student ends up with a topic for his/her thesis within the appropriate specialization. We cannot guarantee, for obvious reasons, the supervision of a particular faculty member, or a desired topic in advance.

Instead of a topic proposed by the faculty, the students can also complete their theses on a topic chosen by themselves, provided they receive permission by a faculty member to be in charge of the supervision. So, if you have a truly desired area of work, go visit an instructor and tell him/her your brilliant ideas. Alternatively, some students receive proposals for a possible bachelor's thesis while they are on an internship, either during the summer or during the first term. Any person in the

¹A few bachelor's theses are offered to be undertaken during the *first term*, too.

industry can propose topics for a thesis, too. The only requirement is that a faculty member serve as the academic supervisor. Note that, in this case, the work towards the thesis can be a continuation of the work done during the practicum, or a new project. Note also that such work cannot last for less than 240 hours.

It is not mandatory to pick a topic within the same specialization you are pursuing, but beware that the committee which will judge your work will be the examining committee of your specialization.

What to submit?

A written dissertation, 10-12 pages long, with an executive summary of your work: introductions, goals, methodology, results, bibliography and, optionally, technical annexes. Please, do not violate the format of the written dissertation, because the same examining committee will have to read the dissertation of many candidates. This task can be extenuating when the dissertations are unduly long. A copy (in PDF format) of your dissertation has to be presented at the administrative office in order to send the documents to the committee members. By the way, your supervisor will not be a committee member (usually!).

Do a careful and stylish writing, since the dissertation is the way of explaining your excellent work to people who are not as expert as you have become on that topic. Go to the point, avoid digressions and informal expressions; organize the contents properly and use figures, tables and diagrams only when they provide enough value.

The public defense

The dissertation is presented to an examining committee elected by appointment for the entire academic year—at least an examining committee for each specialization. All the candidates must present their work the same day, at the dates marked in the academic calendar. There are, however, multiple dates for the presentation:

- First term: a date in February, just after the examinations at the end of the first term. This date is intended mostly for thesis done during the first academic term.
- Second term: a second presentation day will happen in June, some weeks after the examination period at the end of the second term. Clearly, this is for theses done during the second term.
- July: a date in mid-July, again after the examination period ends. This is a date for students having to pass some failed subject in the July exams.

What's the reason for so many dates spread along the year? Well, the ultimate reason is that a student is not allowed to present his/her dissertation until all the subjects have been passed. Keep this in mind, it is important and take it into account when planning the enrollment in your last year.

The session for presenting the dissertation is: 1) public, anyone can attend to your presentation; 2) an academic event, so some formality is due. There is not a strict dress code, however.

The oral part of the dissertation is a short speech (15 minutes is the recommended time) for explaining the motivations of your work, the actual work you made, and the main conclusions. It is followed by a brief discussion with the committee members, after which the session closes for you. Use slides if you wish for highlighting the main ideas in your oral presentation, for presenting diagrams or plots, and for summarizing your conclusions. Recall that the recommended time is around 15 minutes, so 10-15 slides are more than enough. Do not overload the slides with too much information. Not only is this ugly, it is also useless since it distracts attention.

How is it graded?

Bachelor theses receive up to three grades, one by each of the examining committee members. All the grades contribute equally to the final grade, except when the thesis advisor is (by chance) also a member of the examining committee. In those rare cases, a student will receive only two grades, those by the two non-conflicting members of the committee. The way in which the committee members are elected guarantees that at least two of them are instructors in the same specialization as the student. Grades are private, and are communicated, as usual, through FaiTIC and SEIX.

The grades are awarded in close correspondence to the approved rubric for the Bachelor Thesis, a copy of which can be found in FaiTIC.

Graduation with Honors in the Bachelor Thesis is reserved to a maximum of 20% of the students, proportionally to the number of candidates enrolled in a specialization in the current academic year. The honors qualification requires a global grade higher than 9 in the thesis, and it is optionally awarded by the examining committee.

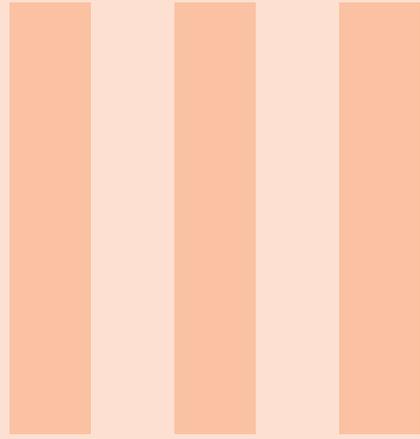
Authorship and Intellectual Property

Students have the right to claim or enforce the declaration of authorship on their Bachelor Thesis, and to demand protection on copyright or royalties derived from that work. The ownership may be shared with the advisors, or with any public or private entity to which they belong, under the settlements provided in the common law.

Confidentiality

Under request by some public or private entity, the object, methods and results contained in a Bachelor Thesis can be subject to non-disclosure, either to protect copyright or by its genuine character. In these cases, the dissertation may contain parts which only the examining committee members are entitled to see. Accordingly, the oral defense may be declared private and closed. The confidentiality agreement must be signed before permission to present the dissertation is granted to the student.

At the end, congratulations! You have graduated and are now a working engineer. It sounds cool, doesn't it?



The Curriculum

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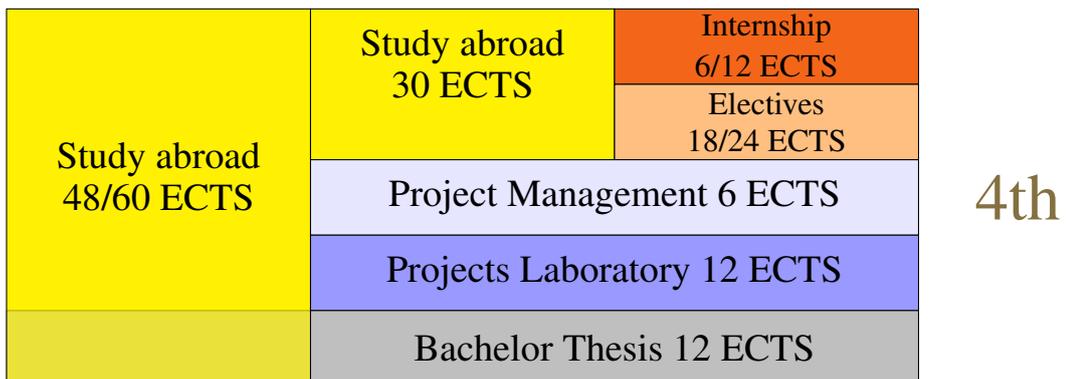
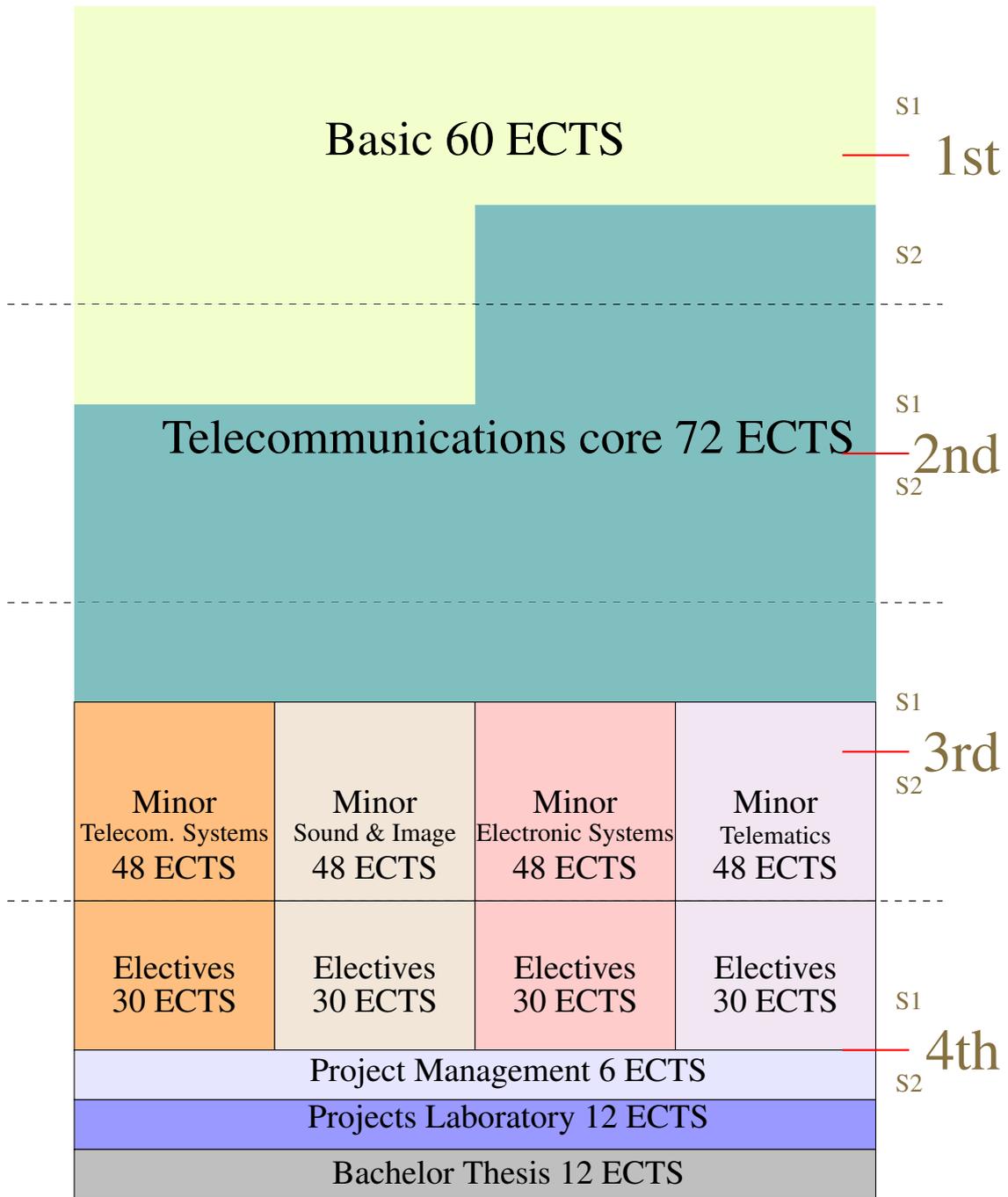
8. Structure

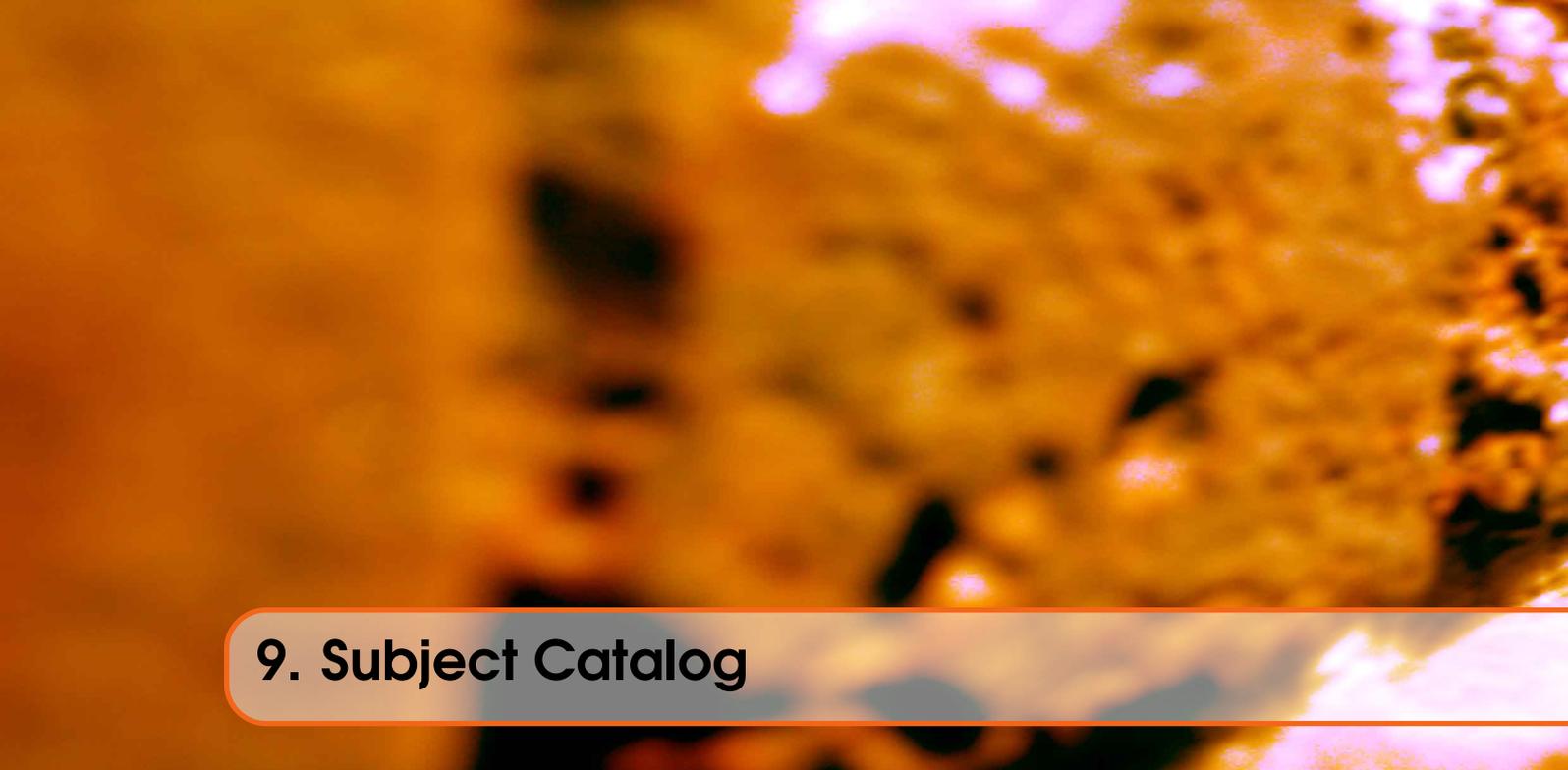
The undergraduate programme encompasses 240 ECTS in four academic years

1. The first year includes 10 mandatory subjects covering the basic scientific formation.¹
2. The second year includes again 10 compulsory core engineering subjects.
3. The third year is mixed: two mandatory core engineering subjects plus three additional specialization subjects during the first term; and 5 more engineering specialization subjects in the second term. Four specializations are offered: Telecommunication Systems, Sound and Image, Electronic Systems, and Telematics.
4. The fourth year in the curriculum is flexible. Students have to complete 30 ECTS in electives, but this can be fulfilled in different ways:
 - By taking 5 elective subjects. These electives can be chosen among the electives corresponding to his/her minor, or by combining these with subjects offered in the first term in other minors.
 - By completing up to 12 ECTS in the internship practice program and the rest with electives. The number of places for internship practice is limited.
 - By studying the 30 ECTS abroad in another European university, without restriction on the topics. The number of places offered for study abroad is also limited.

During the second term, the student must take two special subjects: Projects Laboratory (12 ECTS) and Project Management (6 ECTS). In addition, the student will prepare his/her Bachelor Thesis (12 ECTS). In some special cases, depending on the destination university, permission is granted to study abroad the full year, including the possibility of elaborating the Bachelor Thesis abroad and transfer the grades to UVigo.

¹Actually, only 9 subjects belong to the class of basic subjects. The remaining one is taken in the second year.





9. Subject Catalog

Subjects offered for the academic year 2020/21

(continues)

First Course
G301101 CAL-I *Mathematics: Calculus I*

Real analysis: limits, continuity, derivatives for functions in one and multiple variables. Instructor: Ramón González

G301102 ALG: *Mathematics: Linear Algebra*

Vector spaces, Matrices, determinants, linear and bilinear maps, eigenvalues and eigenvector, applications. Instructor: Alberto Martín

G301103 FMT: *Physics: Principles of Mechanics and Thermodynamics* English friendly course
Kinematics, statics & dynamics. Newton's laws, rotations & oscillations, thermodynamic laws. Instructor: Stefano Chiussi

G301104 EMP: *Foundations of enterprises* English friendly course

A soft introduction to the basic concepts of running an enterprise. Enterprise economy, financial system, production system, marketing system, management. Instructors: Beatriz González & M. Jesús Fernández

G301105 P-I: *Computer science: Programming I* English friendly course

Algorithms and programming languages. C: grammar and programming techniques. Instructor: Pedro S. Rodríguez

G301106 CAL-II: *Mathematics: Calculus II* English friendly course

Riemann integrals in \mathbb{R} and \mathbb{R}^n , orthogonal series, ordinary differential equations. Instructor: Áurea Martínez

G301107 PE: *Mathematics: Probability & Statistics*

Probability theory, random variates, random vectors, estimation, limit theorems, random processes, principles of statistics. Instructor: José R. Fernández, Ignacio Alonso

G301108 AC: *Physics: Linear circuits*

Elementary electrical circuits, Kirchoff's laws, transient and sinusoidal analysis, introduction to linear system theory, Laplace transform, Fourier transform. Instructor: Inés García-Tuñón, Carmen García

First year (continued)

G301109 AO: *Computer Science: Computer Architecture*

Computer organization: the von Neumann computer, symbolic representations, assembly languages, operating systems, peripherals and interfaces. Instructor: Martín Llamas, Manuel J. Fernández

G301110 P-II: *Programming II* English friendly course

Object-oriented programming. Project in Java. Instructor: Yolanda Blanco, Manuel J. Fernández

Second year

G301201 FE: *Physics: Foundations of Electronics* English friendly course

Physics of semiconductors. Electronic devices: diodes & transistors. Bipolar, FET diodes: models. Amplifiers. Instructors: MiguelÁ. Domínguez, Loreto Rodríguez

G301202 CO: *Physics: Fields and Waves* English friendly course

Electromagnetic fields, Maxwell's laws, wave equation, planar waves. Instructor: Professor Antonio Pino

G301203 EDIX: *Digital Electronics*

Digital electronics. Digital logic. Combinational circuits. Sequential systems. Automata. Microprocessors. Semiconductor memories. Instructor: Serafín Pérez, Andrés Nogueiras

G301204 CD: *Data Communications*

Information theory & Coding theory for point-to-point and multiple access channels. Data compression. Instructors: Cándido López, Rebeca Díaz

G301205 PDS: *Digital Signal Processing*

Digital signals. Transformed domains. Fourier series, DFT, FFT. Digital filters. Sampling. Instructor: Ignacio Alonso

G301206 TE: *Electronic Technology* English friendly course

Operational amplifiers. Power electronics: devices, rectifiers, converters. Photovoltaic energy. Instructors: Camilo Qujintán, Herminio Raña

G301207 TEM: *Electromagnetic Transmission* English friendly course

Transmission lines. Optical fibers. Radiowaves and antennas. Electromagnetic measurements. Instructors: María Vera, Edita de Lorenzo

G301208 TTRS: *Signal Transmission and Reception Techniques*

Communication systems design. Modulation/demodulation. Detection of signals. Signal synchronization. Signal receivers. PAM modulation. Matched filters. MAP and ML detection. Instructor: Roberto López, Pedro Comesaña

G301209 FSI: *Sound and Images*

Physiological perception of sound and images. Representation of sound and images. Sound propagation/radiation. Image and video coding standards. Instructor: Manuel Sobreira, Borja González

G301210 RO: *Computer Networks*

Computer networks. Internet architecture. Internet principles and protocols. TCP/IP. Network programming. Instructor: Carlos Ardao, Miguel Rodríguez

Third year (common subjects)

G301301 SINT: *Internet Services*

Distributed, client-server and peer-to-peer services. Structured representation of information. Standardized data transfer. Web services. Instructor: Alberto Gil, Juan C. Burguillo

G301302 CEP: *Programmable Electronic Circuits*

FPGAs. Logic arrays. Programming languages for hardware. Microcontrollers. Hardware/software codesign. Instructor: Francisco Poza

Third year (Minor in Telecommunication Systems)

G300511 CRF: *Radiofrequency circuits* English friendly course

Electronic circuit synthesis for modulation, demodulation, radio receivers. Filters, amplifiers, oscillators, mixers. Microwave circuits. Instructor: Fernando Isasi

G300512 SCR: *Radio Communication Systems*

Radiation. Radio links. Noise and interference. Fading. Wave propagation. Instructor: Professor Óscar Rubiños

G300513 TSMM: *Multimedia Signal Processing* English friendly course

Discrete Fourier transform, FFT. Digital filters. Filter banks. Instructor: Antonio Cardenal

G300611 CMW: *Microwave circuits* English friendly course

Transmission lines. Impedance matching. Passive devices. Active devices. Linear amplifiers. Instructor: Mónica Fernández

G300613 PCD: *Principles of Digital Communications* English friendly course

Carrier and clock recovery. Channel equalization. Channel coding. Error probability. Instructor: Pedro Comesaña

G300614 IOT: *Optical Communications*

Optical waveguides. Optical devices and transmission systems. Instructor: Marcos Curty

G300615 RSI: *Wireless Networks and Systems*

Wireless channels. Wireless transmission. Wireless communication systems. Standards. Professor: Fernando Pérez Fontán

G300616 XER: *Electromagnetic Spectrum Management* English friendly course

Spectrum regulations, management. Electromagnetic compatibility. Frequency plans. Cabling and TCIs. Instructor: Professor Manuel García, Pablo Torío

Third year (Minor in Sound & Image)

G300531 FEAC: *Fundamentals of Acoustic Engineering*

Acoustic power and intensity. Acoustic sources, radiation. Vibrating systems: loudspeakers. Microphones. Instructor: Pablo Torío

G300532 SAUD: *Audio Systems*

Amplifiers. Mixing. Sound capture. Sound quality. Digital audio. Instructor: Antonio Pena

G300533 VTV: *Video and Television* English friendly course

Video recording. Digital television. TV networks. Instructor: Fernando Martín

G300631 TAV: *Audiovisual Technology* English friendly course

Instructor: Soledad Torres

G300632 FPI: *Fundamentals of Image Processing* English friendly course

Preprocessing techniques. Linear and non-linear filtering. Affine transformations. Image restoration. Standards. Instructor: Julio Martín

G300633 SI: *Image systems* English friendly course

Cameras. Medical imaging. Aerial and satellite imaging. Instructor: Julio Martín

G300634 PS: *Sound Processing*

Voice perception, voice utterance. Analysis of audio signals. Speech coding, audio coding. Underwater acoustics. Instructor: Eduardo Rodríguez

G300635 ACARQ: *Architectural Acoustics* English friendly course

Acoustic theory. Acoustic properties of materials. Acoustic design. Acoustic isolation. Instructor: Manuel Á. Sobreira

Third year (Minor in Electronic systems)

G300521 SAD: *Data Acquisition Systems*

Sampling. Analog/digital converters. Instructor: Francisco Poza

G300522 SEPS: *Electronic Systems for Signal Processing*

Arithmetic circuits. Signal sampling. Electronic design for digital filtering, image systems and audio processing. Instructor: Dolores Valdés

G300523 EEE: *Engineering of Electronic Equipment*

Reliability. Availability. Electromagnetic compatibility. Instructor: Jorge Marcos

G300621 IES: *Sensors & Electronic Instruments*

Thermal, optical and other physical sensors. Field buses. Programmable instrumentation. Instructor: Perfecto Mariño

G300622 DM: *Microelectronic Design* English friendly course

Integrated circuits and MEMS: fabrication. Instructor: Ana M. Cao

G300623 SECD: *Electronic Systems for Digital Communications*

Synchronous and asynchronous serial communications. Wireless communications. Instructor: Fernando Machado

G600624 EAN: *Analog electronics*

Feedback amplifiers. Sinusoidal oscillators. Operational amplifiers. Power amplifiers. Power sources. Instructor: Herminio Raña

G600625 EP: *Power Electronics* English friendly course

Devices. Electrotechnics. Current converters. Instructor: Óscar López

Third year (Minor in Telematics)

G300541 SO: *Operating Systems*

Operating systems. Processor scheduling. Virtual memory. Input/output. Virtual machines. Instructor: Prof. José J. Pazos

G300542 ATR: *Network Architecture and Technology*

Network virtualization. IPv6. Label switching. Optical switching. Access technologies. Instructor: Miguel Rodríguez

G300543 SEG: *Security*

Cryptography and cryptoanalysis. Network security. Denial of Service. Security protocols and standards. Instructor: Francisco Fernández

G300641 PCCD: *Distributed and Concurrent Programming*

Concurrency. Atomic operations. Locks. Critical regions. Monitors. Distributed programming. Instructor: Jorge García

G300642 TRC: *Switching and Network Theory*

Queuing theory. Graph theory. Optimization. Instructor: Andrés Suárez

G300643 RMM: *Multimedia Networks*

Digital audio and video coding. Multimedia applications. Multimedia protocols. Quality of service. Instructor: Sergio Herrería

G300644 SINF: *Information Systems*

Database systems. Relational databases: conceptual and logical models. Database management systems. Non-relational databases. Instructor: Jorge García

G300645 AST: *Architecture and Telematic Services*

Web services. Message passing. Service discovery. Composition, orchestration and choreography. Instructor: Fernando A. Mikic

Fourth year (Common core, second term)

G300801 DTEC: *Project Management*

Project management concepts. Business models. Innovation and creativity. Legal issues. Instructor: Professor Javier Castaño

G300802 LPRO: *Projects*

Instructor: Manuel Caeiro

G300991 TFG: *Bachelor's Thesis*

Fourth year – Electives (Minor in Telecommunication Systems)

G300911 TDET: *Remote Sensing*

Sensing devices. Image processing. Geographic information systems. Applications in terrestrial exploration, meteorology, space exploration. Instructor: Professor Íñigo Cuiñas

G300912 SNCS: *Navigation Systems and Satellite Communications*

Satellite systems. Navigation systems. Communication subsystems. Satellite-based communications. Services. Instructor: Carlos Mosquera

G300913 PTR: *Real-Time signal Processing*

Digital signal processor. Time- and frequency-domain algorithms. Digital filters. Instructor: Antonio Cardenal

G300914 CDIX: *Digital Communications*

Multicarrier modulations. Coding, equalizing and synchronization in multicarrier modulations. Standards. Turbo codes, LDPC codes. Instructor: Professor Fernando Pérez González

G300915 FBIO: *Fundamentals of Bioengineering*

Biomedical signals and systems: analysis and interpretations. Diagnosis and therapy. Electromedical systems. Instructor. Professor Ramón Hermida

Fourth year – Electives (Minor in Sound and Image)

G300931 PAIMX: *Image Analysis and Processing*

Image segmentation, clustering and classification. Applications. Instructor: José L. Alba

G300932 TMyCG: *Multimedia Technology and Computer Graphics*

3D modeling and animation. Virtual reality, augmented reality. Videogames. Instructor: Antonio Pena

G300933 ACAV: *Advanced Acoustics*

Finite elements and boundary elements in acoustics. Acoustic calculation methods. Instructor: Manuel Á. Sobreira

G300934 TMRL: *Measurement Techniques for Noise and Legislations*

Noise measurements. Acoustics isolation. Legislation. Instructor: Soledad Torres

G300935 PAV: *Audiovisual Production*

Audiovisual production. Genres and techniques. Instructor: Luis Fernández

Fourth year – Electives (Minor in Electronic systems)

G300921 DAM: *Designing Applications with Microcontrollers*

Architecture and programming of microcontrollers. Instructor: Lucía Costas

G300922 DOE: *Optoelectronic Devices*

LEDs. Optoelectronic detectors. Laser diodes. Image sensors. Optical sensors. Optical fibers.

Instructor: María José Moure

G300923 DSSD: *Design and Synthesis of Digital Systems*

Design of advanced digital systems. Instructor: Luis J. Álvarez

G300924 SEA: *Advanced Electronic Sensors*

Intelligent sensors. MEMS. Fiber optical sensors. Instructor: Perfecto Mariño

G300925 CCI: *Industrial communications*

Field buses. CAN/LIN. Domotics. Instructor: Miguel Á. Domínguez

Fourth year – Electives (Minor in Telematics)

G300941 SMM: *Multimedia Services*

Digital TV broadcasting and streaming. IP television. Video on demand. Instructor: Martín López

G300942 RSFM: *Wireless and mobile networks*

Wireless networks architecture, technology and standards. Instructor: Felipe Gil

G300943 PSI: *Intelligent Systems Programming*

Intelligent agents. Multiagent systems. Game theory. Mobile agents. Instructor: Juan C. Burguillo

G300944 DSI: *Design of Embedded Systems*

Embedded systems. Operating systems. Process scheduling. Distributed systems. Instructor: Pedro S. Rodríguez

G300945 NST: *New Telematics Services*

Semantics web. Support services. e-services. Instructor: Luis Álvarez

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10. The Master Program in Telecommunication Eng

Goals: the connected world

The Master's Program in Telecommunication Engineering offers prospective candidates a unique education emphasizing the global interplay of Mathematics, Physics, Computer Science and Electrical Engineering. Teaching in this program is focused on building and demonstrating technologies that will be required in next-generation systems and their integration into operational communication systems.

Graduates from the program will be ready for international careers in fields such as development, research, operations and management.

You should consider to engage in the Master's Program if you feel strongly motivated for creating systems and tools which may have a long-lasting impact on the industry as well as on the people's lives.

How to apply

We accept candidates with a bachelor degree in communications engineering or a similar qualification—at least 240 ECTS. The number of new students is limited to 50. Enrollment is thus allowed after an admission process:

1. In mid-July, for students getting their bachelor degree in June.
2. In early September, for students getting their bachelor diploma in July.

The curriculum

The Master's Program is a two-year, 120 ECTS program for full-time students. Part-time enrollment is also allowed and has weaker academic performance requirements, though. The curriculum is composed of a set of core subjects (45 ECTS), an specialization (30 ECTS), electives/internship (15 ECTS) and a final research project (the Master's Thesis, 30 ECTS). The core subjects form the major part of the first year, along with 15 ECTS of specialized subjects. The second year contains another 15 credits for specialization, followed by electives or internship and the Master's Thesis.

There are four possible specializations: *signal processing*, *radio communications*, *electronics*, and *telematics*. All of these tracks offer highly advanced training in state-of-the-art technology within their field.

If you have graduated from our School in a given minor, it is not mandatory to continue on the same specialization track in the Master Program. This has been designed so that students can switch their background area of expertise and attain deep insight into another research area.

Subjects offered for the academic year 2020/21

First Year

M145101 TSI: *Telecommunications Engineering in the Information Society*

The role of the telecommunications engineer in the modern society. Instructor: Manuel J. Fernández Iglesias

M145102 TSCOM: *Signal Processing in Telecommunications*

Block transforms. Adaptive filtering and estimation. Multirate processing. Filter banks. Instructor: Roberto López

M145103 RAD: *Radio*

Antenna design. Noise and interference. Radiolink planning. Navigation systems. Radar systems. Instructor: Marcos Arias

M145104 TR: *Networking technologies*

Network modeling. Switches. Ethernet planning. Intra- and inter-domain routing. IP networks. MPLS networks. Instructor: Carlos Ardao

M145105 TA: *Services technologies*

Cloud computing. Distributed computing. Data management. Parallel computing. Instructor: Ana Fernández Vilas

M145106 DCEA: *Design of Analog Electronic Circuits*

Auxiliary circuits. Amplifiers. Active filters. Samplers. Instructor: Vicente Pastoriza

M145201 DPT: *Management of Telecommunication Projects*

The companies. Team management. Workflow. Legislation. Instructor: Professor Javier González Castaño

M145202 EFCO: *Electronics and Photonics for Communications*

Passive circuits. Linear amplifiers. Power amplifiers. Frequency converters. Signal generators. Photonics. Instructor: Mónica Fernández

M145203 SEDA: *Advanced Digital Electronic systems*

CMOS integrated circuits. Sequential design. VHDL. Memories. Frequency synthesis. Instructor: María Dolores Valdés

First Year: Specialism in Signal Processing

M145204 CDA: *Advanced Digital Communications*

MIMO communications. Spectral sensing. Dirty paper coding. OFDM and beyond. Instructor: Professor Carlos Mosquera

M145205 PSSA: *Signal Processing for Audiovisual Systems*

Coding and compression of video and audio signals. Instructor: Fernando Martín

M145206 CMM: *Multimedia Communications*

Advanced source coding. Slepian-Wolf, Wyner-Ziv coding. Joint source-channel coding. Instructor: Pedro Comesaña

First Year: Specialism in Radio

M145207 CO: *Optical Communications*

Photonic devices. Photonic propagations. Nonlinear optics. Optical systems and networks. Instructor: Marcos Curty

M145208 ANT: *Antennas*

Electrodynamics. Types of antennas. Antenna design. Instructor: Francisco J. Díaz

M145209 CMM: *Radio Laboratory*

Instructor: Pablo Torío

First Year: Specialism in Telematics

M145210 ENI: *Internet Engineering*

Advanced channel coding. Datacenter networking. Datacenter protocols. Network function virtualization. Resource allocation. Instructor: Manuel Veiga

M145211 RSFCU: *Wireless Networks and Ubiquitous Computing*

Wireless channels. Standards for wireless communications. Wireless sensors networks. Ubiquitous computing. Instructor: Felipe Gil

M145212 EWEB: *Web Engineering*

Search, retrieval and interpretation of web information. Metadata. Semantics. Instructor: Juan M. Santos

First Year: Specialism in Electronics

M145213 CMAD: *Mixed Analog-Digital Circuits*

Instructor: Camilo Quintáns

M145214 DSE: *Hardware/Software Codesign of Embedded Systems*

Instructor: Francisco Poza

M145215 DFCE: *Design and Manufacturing of Integrated Circuits*

Instructor: José Fariña

Second Year: Specialism in Signal Processing

M145301 PTR: *Real Time Signal Processing*

DSP and GPU programming. GPGUs. Instructor: Fernando Martín

M145302 SACOM: *Advanced Communications Systems*

Convex optimization. Capacity regions. Random matrix theory and applications. Instructor: Professor Carlos Mosquera

M145303 PES: *Statistical Signal Processing*

Estimation. Detection. Fisher information. Cramer-Rao bound. Optimal and MMLSE estimators. Neyman-Pearson formula. Instructor: Roberto López

Second Year: Specialism in Radio

M145311 SAT: *Satellites*

Satellite subsystems. Instructor: Fernando Aguado

M145312 SRBA: *Wideband Radio Systems*

Physical channels. Channel probes. UWB systems. UWB antennas. Instructor: Professor Manuel García

M145313 CMOB: *Mobile and Wireless Communications*

Planning and dimensioning of cellular networks. Standards. Cellular systems. Instructor: Ana Vázquez

Second Year: Specialism in Telematics

M145321 CODIS: *Distributed Comouting*

Transactions. Replication. Grid, cluster and cloud computing. Distributed artificial intelligence. Parallel and evolutionary computing. Instructor: Fernando A. Mikic

M145322 ADA: *Data Analysis*

Statistical data analysis. Data mining. Computational data analysis Instructor: Professor Javier Castaño

M145323 RSE: *Social and Economic Networks*

Fundamental models. Network formation. Difusion and learning over networks. Applications. Instructor: Estela Sousa

Second Year: Specialism in Electronics

M145330 EPFV: *Power Electronics in Photovoltaic*

Instructor: Jesús Doval

M145331 ACS: *Signal Conditioning*

Instructor: Camilo Quintáns

M145332 IEEE: *Realization and Operations of Electronic Circuits*

Instructor: Jorge Marcos

11. The Master Program in Cybersecurity

Goals: protecting the digital world

The Master's Program in Cybersecurity offers prospective candidates a unique education emphasizing the global interplay of Mathematics, Computer Science, Management and Law for training advanced professionals in the field of digital security, forensic analysis and cybersecurity at every technical and non-technical levels.. Teaching in this program is focused on building and demonstrating technologies that will be required in next-generation systems and their integration into operational security systems.

Graduates from the program will be ready for international careers in fields such as development, research, operations and management.

How to apply

We accept candidates with a background in engineering, computer science, or physical sciences, preferably—at least 240 ECTS. The number of new students is limited to 20 in the University of Vigo. Enrollment is thus allowed after an admission process:

1. In mid-July, for students getting their bachelor degree in June.
2. In early September 2019, for students getting their bachelor diploma in July.

This programme is jointly taught by the University of A Coruña and the University of Vigo, therefore having two sites for teaching and learning. The general academic coordination is in charge of the University of Vigo.

The curriculum

The Master's Program is a three semester, 90 ECTS program for full-time students. Part-time enrollment is also allowed and has weaker academic performance requirements, though. The curriculum is composed of a set of core subjects (45 ECTS), electives (15 ECTS), a mandatory practicum in a cybersecurity firm (15 ECTS) and a final research project (the Master's Thesis, 15 ECTS). The core subjects form the first year, along with 15 ECTS of specialized subjects. The last semester contains only the internship and the Master's Thesis.

Subjects offered for the academic year 2020/21**First Year****V05M175V01101 GSI: *Management of information security***

Risks, threats, and vulnerabilities. Management models of information security. Auditing. Instructor: Manuel Caeiro

V05M175V01102 SINF: *Information security*

Cryptography & cryptanalysis. Digital signatures, authentication protocols. Steganography and digital watermarking. Instructor: Manuel Veiga, Fernando Pérez

V05M175V01103 SCOM: *Secure communications*

Computer networks security Instructor: Miguel Rodríguez, Raúl F. Rodríguez

V05M175V01104 SAPP: *Secure applications*

Secure software development, secure web applications. Instructor: Fernando Bellas, Martín López

V05M175V01105 SRED: *Secure networks*

Secure network technology & protocols, link layer and network layer security solutions Instructor: Francisco J. Nóvoa, Raúl F. Rodríguez

V05M175V01201 CLS: *Cybersecurity Law*

Concepts and law in cybersec. Laws and regulations. Cybercrimes Instructor: Virxilio Rodríguez, Patricia Faraldo

V05M175V01202 FORT: *Operating Systems Hardening*

Techniques and procedures for protection of Linux & Windows systems Instructor: Antonio Yáñez, Beatriz Lorenzo

V05M175V01203 INT: *Intrusion tests*

Intrusion detection systems. Detection, countermeasures, protection Instructor: Tiago Fernández, Enrique Costa

V05M175V01204 MWR: *Malware analysis*

Malware detection, malware analysis, tools and techniques for countermeasures Instructor: Juan C. Burguillo

V05M175V01205 SNEG: *Security as a business*

Business models for cybersecurity Instructor: Víctor Carneiro, Ana Fernández Vilas

V05M175V01206 SMOV: *Security in mobile devices*

Hardware and software security for Android and IOS devices Instructor: Cristina López

V05M175V01206 ANF: *Forensic analysis*

Forensic techniques for hardware devices, computers, and systems Instructor: Andrés Suárez

V05M175V01208 SUBI: *Ubiquitous security*

Security for wireless sensors and devices Instructor: Felipe Gil

V05M175V01209 SIND: *Cybersecurity in industrial environments*

Security for automata, controllers, and machines Instructor: Miguel Díaz-Cacho

V05M175V01210 GINC: *Management of incidents*

Incident detection and responses Instructor: Carlos Dafonte, Luis M. Álvarez



FAQ

12. Frequently Asked Questions

1. Where is the information about the enrollment?

See <http://www.teleco.uvigo.es/index.php/es/alumnado/alumnado-actual/matricula>

2. Where can I get the academic calendar, the timetables, exam dates and appointment hours with the faculty?

See <http://www.teleco.uvigo.es/index.php/es/alumnado/alumnado-actual/planificacion-academica>

3. Where can I see the appointment hours of an instructor?

At his/her institutional page at the UVigo website.

4. Where can I get the academic guides?

They are in https://seix.uvigo.es/docnet-nuevo/guia_docent/index.php?centre=305&ensenyament=V05G301V01&idiom

5. Which subjects are offered in English?

Visit [this page](#)

6. Where can I find further information on the mentoring initiative (MEET)?

At <http://www.teleco.uvigo.es/index.php/es/alumnado/alumnado-actual/plan-de-accion-tutorial>

7. Can I substitute some subject(s) by extra-academic activities?

Yes, up to a maximum of 12 ECTS. Look for the recognized activities at the University's website.

8. Can I be released from passing some subject(s)?

Yes, the University rules can exonerate a student from the requirement of completing all the 240 ECTS before graduation. This fact will appear explicitly on your transcript if you abide to such possibility.

9. How can I pursue two different minors?

Simply by completing the academic requirements in each of the minors.

10. Can I enroll in more than 60 ECTS?

Yes, but the maximum amount of credits to take in a year depends on your previous academic performance. See the main document.

11. Can I change my thesis topic or advisor?

It is possible to switch to another thesis topic or to work under a different academic supervisor. Permission has to be headed to the Academic Board first.

12. Can I modify my enrollment during the academic year?

Only at the end of the first term, and under specific premises. Ask at the administrative office.

13. Where is the chart of dependence among the subjects?

In http://teleco.uvigo.es/images/stories/documentos/formularios/matricula/2015-2016/materias_grao_e_os_seus_requisitos

14. Why are the second and successive enrollments more expensive?

To incentivize the student's expected academic performance.

15. Who owns the potential benefits of an academic work?

The student has the ownership of any potential application of his/her work, except when the collaboration, advice or guidance of some member of the faculty has been essential in the inception or the development. Upon this circumstance, the University of Vigo has also property rights on the work and its yieldings.

16. How much time are the exam papers archived?

During their current academic year and until the end of the next. There is no obligation to keep them longer.

17. Are the students' works and exam papers confidential?

Absolutely. All the paperwork is safely destroyed and it is never shown to third persons.

18. Are my grades public?

Yes. Grades are not sensitive personal data and don't hold confidentiality. However, grades are not made public by default. Here is the legal quotation, in Spanish

No será preciso el consentimiento de los estudiantes para la publicación de los resultados de las pruebas relacionadas con la evaluación de sus conocimientos y competencias ni de los actos que resulten necesarios para la adecuada realización y seguimiento de dicha evaluación.

(Ley Orgánica 7/2007, Disposición adicional vigésimo primera).

This point is a frequent source of misunderstanding.

19. I have known by chance a violation of the academic integrity code by a professor or by a student.

You must communicate the violation to the person in charge (academic coordinator, student's dean).

20. I firmly believe that my grade in a subject is unfair. What can I do?

First, do not miss the review session with the instructors. Argue politely to them and make a case for your position. If the grade is not amended and you still have objections, file an official complaint

to the Department.

21. *Can I move to another classgroup?*

No, unless there are academic (not personal) reasons to authorize it, for instance, timetable conflicts among subjects. Send your preferences to the Vice Dean of Academic Affairs, but remember that only a few changes are actually authorized.

22. *A lot of the support material is in English. I dislike, why am I encouraged to study in English?*

You already have (or must have) a good reading comprehension of English, virtually the universal language in science and technology (aside from Mathematics, indeed). The Telecommunications jargon is mostly in English. Learn it.

23. *What is plagiarism?*

Use of other people's work without permission, even unintentional use. Sheer reproduction, partial or total, of other works without acknowledgement or proper citation. This includes written documents, computer programs and any type of audiovisual material. Even when permission by others had been granted, use another people's work pretending it is yours is plagiarism, too.

Plagiarism is theft of intellectual property. It is dishonest. We cannot condone this. As a future professional, neither should you.

24. *I am a new student. Do I need previous exposure to computer programming?*

No. Programming experience is not required. Programming languages are tools, not targets.

25. *Are the exam solutions published?*

There is not a general policy about this, the decision corresponds to the faculty in charge of the subject.

26. *What is a chartered profession or chartered degree?*

In Spain, some jobs require by law enforcement a specific university degree, since they are considered essential public goods. Telecommunications engineering is one of those professions which cannot be practiced without having the appropriate qualifications. Thus, the diploma entitles you to occupy such jobs.

27. *Are lectures or courses recorded in video?*

No. There are video recordings of only a few courses.

28. *I missed a midterm exam. Can I retake it?*

No. Midterms or intermediate examinations cannot be retaken.

29. *Can I get academic credit for my language skills?*

Yes, the University grants up to 6 ECTS to those students who have acquired during their undergraduate years language skills certified by any official institute, like the Centro de Linguas or the Escuela Oficial de Idiomas.

Escola de Enxeñaría de Telecomunicación
 Calendario Académico 2020/21 (Grao)

2020/2021

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Semana 17						Semana 16						Semana 15						Semana 14																													
Fin de carreira: 18 set -- 13 nov												Fin de carreira: 27 nov												Fin de carreira: 10 dec -- 19 feb												Fin de carreira: 14 abr -- 25 xun											
1º cuadrimestre: 10 dec -- 19 feb												1º período: 26 feb												2º cuadrimestre: 14 abr -- 25 xun												2º período: 2 xul											
2º cuadrimestre: 14 abr -- 25 xun												2ª oportunidade: 17 set 2021												2ª oportunidade: 30 xun -- 26 xul												2ª oportunidade: 17 set 2021											

Inicio/fin de clases 2º-4º

Inicio/fin de clases 1º

Presentación TFG

Entrega de actas

X Non lectivo

Exames

Exames FC

Aprobado na Comisión Académica de Grao do 15 de xullo de 2020