

**Fundamentals of Engineering**

Code: 103805  
ECTS Credits: 6

Degree	Type	Year	Semester
2502441 Computer Engineering	OB	1	1

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

**Contact**

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**Use of Languages**

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

**Teachers**

Cristina Romero Tris  
Antonio Ricardo Manresa Robledo  
Montse Serra Vizern  
Pedro Luis Pons Pons  
Anna Bàrbara Sikora

**Prerequisites**

This is a first year and first semester subject, therefore, there are no prerequisites required.

**Objectives and Contextualisation**

The fundamental objective of the subject is to know the general field of engineering, describe the fundamental aspects of the profession of engineer and apply concepts related to the resolution of problems in engineering, introducing all those tools that allow transforming these solutions into applied computer engineering projects.

**Competences**

- Acquire thinking habits.
- Act ethically and professionally.
- Communication.
- Have the capacity to solve problems with initiative, decision making, autonomy and creativity. Have the capacity to know how to communicate and transmit the knowledge and skills of the IT engineering profession.
- Have the capacity to understand the importance of negotiation, effective work habits, leadership and communication skills in all environments of software development.
- Have the right personal attitude.

## Learning Outcomes

1. Communicate efficiently, orally or in writing, knowledge, results and skills, both in the professional environment and before non-expert audiences.
2. Contribute to the welfare of society and to sustainable development.
3. Develop curiosity and creativity.
4. Develop scientific thought .
5. Know the methods and procedures of engineering.
6. Resolve problems with initiative and autonomy.
7. Understand the importance of negotiation, effective work habits , leadership and communication skills in all development environments software , at a basic level .
8. Understand the mains of engineers.
9. Use efficiently ICT communication and transmission of ideas and results.
10. know the educational area and professional computer engineering .

## Content

Lesson 0.- Subject introduction

Lesson 1.- Introduction to engineering: definitions of engineering, engineering as a profession, professional opportunities, engineering studies.

Lesson 2.- Types of environments for the development of engineering projects: software, hardware, user interface.

Lesson 3.- Tools for the development of engineering projects: Makefiles, generation of libraries (libraries), autotools, repositories, debugging tools, IDEs.

Lesson 4.- Fundamentals of OS.

## Methodology

The subject is planned to be carried out in person, if for reasons beyond the programming of the subject, the teaching methodology had to be changed, the classes would be carried out in a telepresencial way, that is, in synchronous sessions following the schedule established by the coordination of the degree.

All the sessions of this subject will be carried out in *hands-on* format, therefore, the student must come to class with his/her personal laptop.

**Theory:** The theory part of the subject combines sessions where the theoretical concepts of the subject will be introduced. The detailed content of each session will be detailed in the planning of the subject that will be published on the first day of class in the Virtual Campus.

**Problems:** The problem part consists of analyzing and solving exercises in the classroom. The sessions dedicated to this teaching typology, as well as the content of each session, will be detailed in the planning of the subject that will be published on the first day of class in the Virtual Campus

**Practices:** The practical activity consists of solving practical projects in groups. These practical assignments will include different theoretical concepts introduced and worked on in theory and problem sessions. The sessions dedicated to practices and its content will be published in the Virtual Campus of the subject.

In this subject, the following transversal competences are studied and evaluated:

- T01.03 - Develop scientific thinking: working on theory classes and problem sessions and evaluating the defenses of practices / projects made by students.

- T04.01 - Communicate efficiently, orally or in writing, knowledge, results and skills, both in professional environments and in front of non-expert audiences: Worked in the theory and practical sessions and evaluated in the practice sessions.
- T04.02 - Make efficient use of ICT in communication and the transmission of ideas and results: Worked in the theory and practical sessions and evaluated in the practice sessions.
- T05.03 - Contribute to the welfare of society and sustainable development: Worked in the theory classes and evaluated in the individual exams of the subject.
- T06.02 - Develop curiosity and creativity: Worked in the theory classes and evaluated in the individual exams of the subject.

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

## Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Practices	12	0.48	1, 5, 4, 3, 9, 6
Problems	12	0.48	5, 4, 3, 6
Theory	22	0.88	8, 7, 1, 2, 5, 10, 4, 3, 9, 6
Type: Autonomous			
Study of the subject, preparation and implementation of problems and practices	98	3.92	5, 4, 3, 6

## Assessment

### a) Training activities

Theory / Problems Control 1: 30% of the final grade;

Theory / Problems Control 2: 30% of the final grade;

Practices: 40% of the final grade;

To pass the subject,  
the weighted average of the three evaluation activities must be at least 5.

This rule will be applied as long as the following conditions are met:

- The grade obtained in Control 1 and Control 2 is at least 3.5 each and the average mark of both exams is, at least, 5.
- The grade obtained in Practices is, at least, 5.

In the case of not passing the subject, the numerical note of the final mark will be the lowest value between 4.5 and the weighted average of the obtained grades.

#### b) Training activities schedule

The scheduling of the evaluation activities will be given on the first day of the subject and will be made public through the Virtual Campus. These dates may be subject to programming changes for reasons of adaptation to possible incidents; these changes will always be informed through the virtual campus since it is understood that this is the usual mechanism of exchanging information between lecturer and students.

#### c) Retake Process:

Those students who, having done the continuous assessment, have not achieved the minimum necessary to pass the subject, will have the option to retake the entire Theory / Problems part in a single exam. The maximum mark that can be obtained in this exam is a 7, therefore, this will be the maximum mark that can be obtained in the Theory/Problems part of the retake process. The part of Practices, given its nature, cannot be retaken.

#### d) Procedure for qualifications review

For each evaluation activity, a place, date and time will be indicated allowing students to review the activity with the lecturer. If students do not take part in this review, no further opportunity will be made available.

#### e) Qualifications

In order to pass the course with honours, the final grade must be a 9.0 or higher taking into account the number of students enrolled in the course and bearing in mind the regulation of UAB.

Given that evaluation methodology is continuous assessment, the fact of presenting any training activity (exercises, tests, problems, control, practices ...) is interpreted as the intention of being evaluated on that subject and, therefore, the grade will be different than *Not Avaluable* (NA). An NA grade can only be obtained by not delivering evaluable evidences throughout the course

#### f) Irregularities by the student, copy and plagiarism

Notwithstanding other disciplinary measures deemed appropriate, and in accordance with the academic regulations in force, assessment activities will receive a zero whenever a student commits academic irregularities that may alter such assessment. Assessment activities graded in this way and by this procedure will not be re-assessable. If passing the assessment activity or activities in question is required to pass the subject, the awarding of a zero for disciplinary measures will also entail a direct fail for the subject, with no opportunity to re-assess this in the same academic year. Irregularities contemplated in this procedure include, among others:

- the total or partial copying of a practical exercise, report, or any other evaluation activity;
- allowing others to copy;
- presenting group work that has not been done entirely by the members of the group;
- presenting any materials prepared by a third party as one's own work, even if these materials are translations or adaptations, including work that is not original or exclusively that of the student;
- having communication devices (such as mobile phones, smart watches, etc.) accessible during theoretical-practical assessment tests (individual exams).

In summary: copy, let copy or plagiarize (or attempt) in any of the evaluation activities, is equivalent to grade NO PASS, not compensable and without validation of parts of the subject in subsequent courses.

#### g) Evaluation of repeating students

There is no provision for a different evaluation for the repeating students

## Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Practices	40	2	0.08	8, 7, 1, 5, 10, 4, 3, 9, 6
Theory/Problems Control 1	30	2	0.08	8, 7, 2, 5, 10, 4, 3, 6
Theory/Problems Control 2	30	2	0.08	8, 7, 2, 5, 10, 4, 3, 6

## Bibliography

Subject material: Virtual Campus

ACM - IEEE Computing Curricular 2020 (CC2020)

(<https://www.acm.org/binaries/content/assets/education/curricula-recommendations/cc2020.pdf>)

ACM - IEEE Computer Engineering Curricula 2016,

[www.computer.org/volunteering/boards-and-committees/professional-educational-activities/curricula](http://www.computer.org/volunteering/boards-and-committees/professional-educational-activities/curricula)

ACM - IEEE Software Engineering 2014, Curriculum Guidelines for Undergraduate Degree Programs in Software Engineering, <https://www.acm.org/binaries/content/assets/education/se2014.pdf>

ACM - IEEE Information Technology Curricula 2017,

<https://www.acm.org/binaries/content/assets/education/curricula-recommendations/it2017.pdf>

"Bash Guide for Beginners". Machtelt Garrels. eBook disponible a

[https://tecmintradedpub.com/free/w\\_mach02/](https://tecmintradedpub.com/free/w_mach02/)

"Pro Git". Scott Chacon, Ben Straub. Apress 2014. eBook disponible a <https://git-scm.com/book/es/v2>

"Advanced Bash-Scripting Guide". Mendel Cooper. eBook disponible a

[https://tecmintradedpub.com/free/w\\_advb01/](https://tecmintradedpub.com/free/w_advb01/)

"Autotools: A Practioner's Guide to GNU Autoconf, Automake, and Libtool". John Calcote. No Startch Press, San Francisco, 2010.

"Introduction to Linux - A Hands on Guide". Machtelt Garrels. eBook disponible a

[https://linuxquestions.tradedpub.com/free/w\\_mach01/](https://linuxquestions.tradedpub.com/free/w_mach01/)

"Ubuntu Desktop Guide". Disponible a <https://help.ubuntu.com/stable/ubuntu-help/index.html.en>

## Software

VirtualBox ([virtualbox.org](http://virtualbox.org))

Ubuntu ([ubuntu.com](http://ubuntu.com))

Git (<https://git-scm.com/>)

GNU software (<https://www.gnu.org/>)