UAB
Universitat Autònoma de Barcelona

Engineering Fundamentals for LSCM

Code: 44757
ECTS Credits: 6

2025/2026

Degree	Type	Year
Logistics and Supply Chain Management	OB	1

Contact

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Teachers

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Teaching groups languages

You can view this information at the end of this document.

Prerequisites

None.

Objectives and Contextualisation

Understanding of what engineering is and the different aspects on problem solving.

Practical problem solving by the application of the appropriate methodology.

Learning and practicing of some aspects and methodologies applied to innovation application in problem solving.

Review basic concepts (statistics, probability, programming) that will ensure a solid base for the rest of the subjects of the master's degree.

Overview of the key concepts in Artificial Intelligence.

Learning Outcomes

1. CA08 (Competence) Devise a solution to a new problem from a scientific perspective by applying engineering methods to the problem-solving cycle.

2. KA11 (Knowledge) Identify and define the basic principles behind solving engineering problems.
3. SA12 (Skill) Analyse how to apply engineering and information technology tools to logistics.
4. SA13 (Skill) Organise and allocate necessary material resources in order to fulfil a project's different tasks and needs.

Content

Theoretical sessions

- Framework for problem solving
- Modelling introduction (graphs, decision trees)
- Communicate with data (problem based)
- Artificial Intelligence introduction
- Statistical Learning fundamentals
- Deep Learning basics
- Deep Reinforcement Learning Intro

Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Exercise sessions	8	0.32	
Individual problem solving	20	0.8	
Oral project presentations	2	0.08	
Practical sessions	15	0.6	
Project development	45	1.8	
Self-study	30	1.2	
Theoretical sessions	22	0.88	
Tutorship sessions	8	0.32	

Teaching will be offered on campus or in an on-campus and remote hybrid format depending on the number of students per group and the size of the rooms at 50% capacity.

The general methodological approach of the course is based on the principle of multidiversity of strategies which it is intended to facilitate the active participation and the construction of the learning process by the student, under the principle of "learning by doing".

In this subject, the use of Artificial Intelligence (AI) technologies is permitted as a distinct and integrated part of the development process, provided that the final outcome demonstrates a substantial contribution from the student in terms of analysis and personal reflection.

Students must clearly identify the portions of their work that have been generated using AI tools, specify the technologies employed, and include a critical reflection on how these tools have influenced both the process and the final outcome of the activity.

A lack of transparency regarding the use of AI will be considered a breach of academic integrity and may result in a grade penalty for the assignment. In more serious cases, further academic sanctions may apply.

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.

Assessment

Continous Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Continuous assesment in theory and problem lectures	40	0	0	CA08, KA11, SA12, SA13
Lab sessions	60	0	0	CA08, KA11, SA12, SA13

The assesment method has two main elements:

- Continuous assesment in theory and problem lectures: Students are assessed by means of multiple problems proposed in class. Along the course they get more and better strategies to face these problems. Thus, their evolution is assessed.
- Lab Sessions: In each lab session, a problem will be proposed for students to solve. Every student must submit an individual assignment including their working code along with a detailed explanation of the resolution process. At the end of the semester, a final project will be assigned, which will require students to integrate and apply the knowledge acquired throughout the course.In order to average all the evaluation activities, the mark of each of them must be above 5 points (out of 10). All the report-based activities must be submitted within the due dates specified by the professor. If a report-based activity is failed, the student will be asked to re-submit its report according to the corrections/indications provided by the professor. If the exam is failed, the student will have the opportunity to retake it. The dates for retaking an exam will be communicated to the student well in advance.

The student can submit to the recovery whenever it has been presented to a set of activities that represent a minimum of two thirds of the total grade of the subject.

The assessment method is the same for students who repeat the subject.

The weights of each evaluation activity are given in the table below.

The proposed evaluation activities may undergo some changes according to the restrictions imposed by the health authorities on on-campus courses.

Bibliography

Brockman, Jay B. Introduction to engineering: modeling and problem solving. John Wiley & Sons, Inc., 2009.

Gómez, Alan G y otros. Engineering your future: a project-based introduction to engineering. Great Lakes Press, Inc., 2006.

An Introduction to Statistical Learning with application in R. Gareth James, Srpinger 2013

Software

PyCharm

Groups and Languages

Please note that this information is provisional until 30 November 2025. You can check it through this link. To consult the language you will need to enter the CODE of the subject.

Name	Group	Language	Semester	Turn
(PAULm) Classroom practices (master)	1	English	first semester	morning-mixed
(PLABm) Practical laboratories (master)	1	English	first semester	morning-mixed
(TEm) Theory (master)	1	English	first semester	morning-mixed