



Course guide

220107 - MSS - Systems Modelling and Simulation

Last modified: 19/04/2023

Unit in charge: Terrassa School of Industrial, Aerospace and Audiovisual Engineering
Teaching unit: 707 - ESAII - Department of Automatic Control.

Degree: BACHELOR'S DEGREE IN INDUSTRIAL TECHNOLOGY ENGINEERING (Syllabus 2010). (Compulsory subject).

Academic year: 2023 **ECTS Credits:** 4.5 **Languages:** Catalan

LECTURER

Coordinating lecturer: ANTONIO GUASCH PETIT

Others: JAUME FIGUERAS JOVE

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:

CE29T-GETI. Knowledge and skills for modeling and simulating systems. (Specific Technology Module - ESEIAAT Itinerary)

TEACHING METHODOLOGY

The course combines the following complementary activities:

- The lectures by professors.
- Practices in the laboratory.
- The voluntary exercises proposed as autonomous work.

LEARNING OBJECTIVES OF THE SUBJECT

The subject of Modelling and Simulation Systems aims to provide the student with the knowledge and skills necessary to design mathematical models of dynamic systems, simulate it and analyse its behaviour. The emphasis will be on the modelling and simulation of continuous and discrete event models that can be of interest on the Industrial Engineering field.

STUDY LOAD

Type	Hours	Percentage
Self study	67,5	60.00
Hours large group	31,0	27.56
Hours medium group	14,0	12.44

Total learning time: 112.5 h

CONTENTS

Module 1: Introduction

Full-or-part-time: 7h 30m

Theory classes: 4h

Self study : 3h 30m



Module 2: modelling continuous systems

Full-or-part-time: 22h

Theory classes: 4h

Practical classes: 2h

Self study : 16h

Module 3: Analysis and Simulation of continuous systems

Full-or-part-time: 25h

Theory classes: 5h

Laboratory classes: 4h

Self study : 16h

Module 4: Modelling discrete event systems

Full-or-part-time: 29h

Theory classes: 9h

Laboratory classes: 4h

Self study : 16h

Module 5: Simulation and analysis of discrete event systems

Full-or-part-time: 29h

Theory classes: 9h

Laboratory classes: 4h

Self study : 16h

ACTIVITIES

THEORY LESSONS

Full-or-part-time: 62h

Theory classes: 28h

Self study: 34h

LABORATORY PRACTICE

Full-or-part-time: 32h

Practical classes: 14h

Self study: 18h

MIDTERM EXAM

Full-or-part-time: 1h

Theory classes: 1h



FINAL EXAM

Full-or-part-time: 2h
Theory classes: 2h

INDIVIDUAL EXERCISES

Full-or-part-time: 15h 30m
Self study: 15h 30m

GRADING SYSTEM

The final grade depends on the following evaluative acts:

- First theory exam: 35%
- Second theory exam: 35%
- First laboratory exam: 15%
- Second laboratory exam: 15%

The course will provide for procedures to recover unsatisfactory results. Concretely, the unsatisfactory results obtained from the first exam of theory could be recover by the second theory exam and unsatisfactory results obtained from the first laboratory exam could be recover by the second laboratory exam. The obtained qualification of the second theory exam could replace the obtained by the first theory exam if the qualification of the second theory exam is higher than the first one. Moreover, the obtained qualification of the second laboratory exam could replace the obtained by the first laboratory exam if the qualification of the second laboratory exam is higher than the first one. All students will be entitled to this reconduction.

EXAMINATION RULES.

Anyone that does not attend to any of the evaluative activities will be graded with a 0 if he/she has attended any other one.

BIBLIOGRAPHY

Basic:

- Cellier, F. E. Continuous system modeling. 1991. New York: Springer-Verlag, 1991. ISBN 0387975020.
- Guasch, A. [et al.]. Modelado y simulación: aplicación a procesos logísticos de fabricación y servicios [on line]. 2ª ed. Barcelona: Edicions UPC, 2003 [Consultation: 19/05/2020]. Available on: <http://hdl.handle.net/2099.3/36767>. ISBN 8483017040.
- Pidd, M. Tools for thinking: modelling in management science. 3rd ed. Chichester: John Wiley & Sons, 2009. ISBN 9780470721421.