

205053 - Introduction to Metaheuristics for Optimization Problems

Coordinating unit: 205 - ESEIAAT - Terrassa School of Industrial, Aerospace and Audiovisual Engineering
 Teaching unit: 732 - OE - Department of Management
 Academic year: 2019
 Degree: MASTER'S DEGREE IN SPACE AND AERONAUTICAL ENGINEERING (Syllabus 2016). (Teaching unit Optional)
 MASTER'S DEGREE IN INDUSTRIAL ENGINEERING (Syllabus 2013). (Teaching unit Optional)
 MASTER'S DEGREE IN AERONAUTICAL ENGINEERING (Syllabus 2014). (Teaching unit Optional)
 ECTS credits: 3 Teaching languages: English

Teaching staff

Coordinator: Jose M Sallan

Teaching methodology

Through presential classes and proposed exercises, students will learn the basics of metaheuristics and how to apply them to specific optimization problems.

Learning objectives of the subject

The aim of this course is to introduce students to some metaheuristics used to solve optimization problems, such as genetic algorithms, simulated annealing, tabu search and others. At the end of the course, students should be able to define heuristics for specific problems, code them and use the generated code to solve instances of the problem

Study load

Total learning time: 75h	Hours large group:	27h	36.00%
	Hours medium group:	0h	0.00%
	Hours small group:	0h	0.00%
	Guided activities:	0h	0.00%
	Self study:	48h	64.00%

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Content

Module 1: Introduction to metaheuristics for optimization problems	Learning time: 6h Theory classes: 3h Self study : 3h
Description: Introduction to metaheuristics for optimization problems	
Module 2: Tree search metaheuristics: branch and bound	Learning time: 15h Theory classes: 6h Self study : 9h
Description: Tree search metaheuristics: branch and bound	
Module 3: Evolutionary algorithms: genetic algorithms	Learning time: 27h Theory classes: 9h Self study : 18h
Description: Evolutionary algorithms: genetic algorithms	
Module 4: Local search metaheuristics: simulated annealing, tabu search	Learning time: 27h Theory classes: 9h Self study : 18h
Description: Local search metaheuristics: simulated annealing, tabu search	

Qualification system

The grade is obtained through two assignments, weighting 15% each, and two projects, one about heuristics implementation weighting 40% and another about heuristics testing with a weight of 30%.

Bibliography