

## Search and Optimization

Academic Year: ( 2024 / 2025 )

Review date: 24-05-2023

Department assigned to the subject: Computer Science and Engineering Department

Coordinating teacher: LINARES LOPEZ, CARLOS

Type: Electives ECTS Credits : 3.0

Year : 1 Semester : 1

## REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Programming  
Artificial Intelligence

## OBJECTIVES

The subject is devoted to the study of the main programming techniques and the design of algorithms (both deterministic and stochastic) for solving discrete optimization tasks, both constructive and traversing the solutions space.

## DESCRIPTION OF CONTENTS: PROGRAMME

1. Dynamic Programming
2. SAT Compilation
3. Search
  - 3.1. Uninformed search
  - 3.2. Heuristics: constraint relaxation and pattern databases
  - 3.3. Heuristic search
4. Monte-Carlo Tree Search:
  - 4.1. MCTS
  - 4.2. UCT
  - 4.3. MC- y DP-backups

## LEARNING ACTIVITIES AND METHODOLOGY

Learning activities:

Theoretical lectures (AF1)  
Practical sessions (AF4)  
Tutorials (AF5)  
Team work (AF6)  
Individual student work (AF7)

Teaching methodologies:

Resolution of practical cases, problems, etc... raised by the lecturer individually or in a group (MD3)  
Preparation of work and reports individually or in groups (MD5)

## ASSESSMENT SYSTEM

<b>% end-of-term-examination:</b>	100
<b>% of continuous assessment (assignments, laboratory, practicals...):</b>	0

Individual or team work carried out during the semester, either face-to-face or e-learning activities: 40% (SE2)

The continuous assessment is computed from the scores of two lab assignments, each scoring 20% over the final score to be done in teams of two students

<b>% end-of-term-examination:</b>	100
<b>% of continuous assessment (assignments, laboratory, practicals...):</b>	0

Partial and/or final exams: 60% (SE3)

The final exercise consists of an oral presentation of either a theoretical or practical exposition, with a weight of 60% over the final score.

% end-of-term-examination	60
% of continuous assessment (assignments, laboratory, practicals...)	40