

## Automatic Planning

Academic Year: ( 2023 / 2024 )

Review date: 27-05-2023

Department assigned to the subject: Computer Science and Engineering Department

Coordinating teacher: GARCIA OLAYA, ANGEL

Type: Electives ECTS Credits : 3.0

Year : 1 Semester : 1

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

None

## OBJECTIVES

- To present state-of-the-art automated planning techniques
- To characterize every technique as well as the domains they suit better
- To use tools that implement techniques discussed in class
- To identify different open issues for research in order to suggest new Master and PhD thesis

## DESCRIPTION OF CONTENTS: PROGRAMME

1. Introduction
  - 1.1 Knowledge representation
  - 1.2 Heuristic Search
2. Classical planning
  - 2.1 State space. STRIPS
  - 2.2 Partial plans. UCPOP
3. Planning based on plan graphs
  - 3.1 Plan graphs. GRAPHPLAN
  - 3.2 SAT planning. SATPLAN
4. Heuristic planning
  - 4.1 Early approaches. HSP, FF
  - 4.2 New heuristics and planners. Fast downward, pattern data bases, landmarks, symbolic planning, portfolios
  - 4.3 Hierarchical Task Networks (HTN). SHOP2
5. Machine learning in planning
6. Other planning paradigms
  - 6.1 Temporal planning (scheduling)
  - 6.2 Partial Satisfaction Planning
  - 6.3 Planning under uncertainty
  - 6.4 Timeline-based planning

## LEARNING ACTIVITIES AND METHODOLOGY

Lectures  
 Weekly homework  
 Final project with oral presentation  
 Individual office hours

## ASSESSMENT SYSTEM

50% Oral presentation of final project (final exam): 20% work, 30% presentation  
 40% weekly homework  
 10% class tests

Extraordinary evaluation: 100% project

<b>% end-of-term-examination:</b>	30
<b>% of continuous assessment (assignments, laboratory, practicals...):</b>	70

## BASIC BIBLIOGRAPHY

- James F. Allen, James Hendler y Austin Tate (eds.) Readings in planning, Morgan Kaufmann, 1990..
- Malik Ghallab, Dana Nau, Paolo Traverso Automated Task Planning. Theory & Practice, Morgan Kaufmann, 2004.
- Stuart Russell y Peter Norvig Artificial Intelligence: A modern approach, Prentice Hall, 2010

#### BASIC ELECTRONIC RESOURCES

- ICAPS council . ICAPS: <https://www.icaps-conference.org/>