

INTELLIGENT SYSTEMS M

Degree in Computer Engineering

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2016/2017

CONTENTS (Fundamentals of AI)

Basic techniques of AI

- Problem solving as search in a state space
- Informed and uninformed search strategies
- Constraint Solving
- Game Theory
- Knowledge representation.
 - Objects in Ai
 - Logic and resolution
- Prolog and SLD trees

CONTENTS (Intelligent Systems)

- Planning
 - Nonlinear Planning
 - hierarchical planning
 - conditional planning
 - graph-based planning
- Swarm Intelligence
 - Ant colony optimization
 - Particle Swarm Optimization
- Constraint programming and optimization
 - applications
 - search strategies and advanced propagation
- machine learning
 - decision trees
 - neural networks
- seminars

AIMS

- **Foundations of AI**
 - Knowing the basic principles of Artificial Intelligence
 - Know Prolog, a logic language behind many AI applications
- **Intelligent systems**
 - Extend the foundations
 - Apply the knowledge gained in the first course to solve complex problems
 - Investigate these problems and the main instruments
 - Practical examples

AIMS

- **In addition, the course aims at**
 - providing the ability to evaluate an advanced software tool
 - Teaching how to critically read a review article on a topic of the course
 - Providing a practical approach to real problems
 - Giving students the chance to hear seminars proposed by researchers actively involved in advanced research in AI

RATING

The module assessment includes:

- A written test
 - This is tested exercises and theoretical questions on all topics of the course

Upcoming dates

- June 16, 2016 9:30 room 6.1
- July 13, 2016 9:30 room 6.1
- September 14, 2016 9:30 room 6.1

- Always check on AlmaEsami: possible changes

AI PROJECT (4 CFU)

- A project to be agreed with the teacher
 - The project may concern:
 - the use of an existing tool to solve complex application
 - the development of a tool for an AI application
- The project must be discussed with the teacher and accompanied by:
 - A report describing the project along with the project code.
 - A presentation summarizing the main points of the project.
 - The code

Prerequisites ...

- Foundations of AI
- Operations research can be useful for the constraint programming part of the code
- IS' essential Follow the laboratory for the duration of the course

LABORATORY

- Guided Activity
- Free activity (when available)

USEFUL INFORMATION

- Office hours
 - Thursday 10-12 (DISI)
- Email
 - michela.milano@unibo.it
- Phone and Fax
 - 051.20.93790 051.20.93073

USEFUL INFORMATION

- Teaching assistant: Michele Lombardi
- Office hours
 - Contact by email
- Email
 - michele.lombardi2@unibo.it
- Phone and Fax
 - 051.20.93890 051.20.93073

THE WEBSITE OF THE COURSE

<http://ai.unibo.it/teaching/sistint1516>

- Your point of reference for
 - teaching materials (slides, exercises)
 - articles
 - free software
 - texts of exams and their solutions
- Exam dates and results available on

<https://almaesami.unibo.it/>

LABORATORY EXERCISES

- **LAB2**
 - Friday 11-14
- **Remember**
 - if there are free places you can access the laboratory at a different time
 - free tools can be downloaded by students

REFERENCE Books

- **Lessons projected slides**
 - available on the Web site
- **Books (available in the library)**
 - SJ Russell, P. Norvig, "Artificial Intelligence: A Modern Approach", Pearson, Prentice Hall, 2005.
 - Nils J. Nilsson, "Artificial Intelligence", Apogee, 2005.
 - E. Rich, K. Knight: "Artificial Intelligence", McGraw Hill, Second Edition 1992.
- **Articles**
 - Review papers are available on the web site of the course.