

Fundamentals of Artificial Intelligence

Chapter 00: Course Overview

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M.S. Course “Artificial Intelligence Systems”, academic year 2024-2025

Last update: Friday 6th September, 2024, 09:07

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Outline

1 Practical Information

2 About the Course

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Important:

Please be aware that all classes may be video-recorded (including students' questions & speeches) and that the recordings may be made available online.

Target

- The course will be given **in English**.
- The course is intended for 1st year students of the M.S. program “**Artificial Intelligence Systems**” at DISI, University of Trento.
 - Students from other programs, however, are welcome.

Timetable

Timetable:

1st Semester, **September 9th–December 20th**

- CLASS: Monday 09.30-11.30, Room A109 (Povo 1)
- LAB: Wednesday 11.30-13.30, Room A104 (Povo 1)
- CLASS: Friday 09.30-12.30/13.30, Room A207 (Povo 1)^(*)

The course is given solely **in presence**.

(*) four hour-slot: may be used to catch up with some missed class

Office Hours & Forum

Office hours:

- No weekly fixed-day
- Anytime in the week, **upon appointment only**
- In presence (only after class) or via zoom
- Appointments to be set in class or via email
- **Office hours only during class period (see above)!**

Forum

A forum for Q&A is available at the course page in the [Moodle](#) platform

You shall register to the [Moodle](#) platform of the course!

Important: Email Communications

Important

Teaching this course is only part of our job, and we receive a huge amount of email. Thus:

- email to both me and the teaching assistants
- use as subject “[Fundamentals of AI]: subject”
- email only from your “official” UNITN email address “name.surname@studenti.unitn.it”
- email for **relevant** reasons only
- be polite and respectful, with both me and the T.A.s
(see e.g. [“Bad Email Reply – What not to say to your professor”](#))

PS: Be aware that even professors use social media ([example](#))

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Motivations & Goals

Motivations

- **Artificial Intelligence** (hereafter simply “AI”) is an umbrella term, covering a large and heterogeneous amount of disciplines (e.g. problem solving, knowledge representation and reasoning, planning, reasoning under uncertain knowledge, learning, ...).
- This course aims at providing an overview of the foundations of AI and of (some of) its main disciplines in an organic way.
- Examples and exercises will be provided during the course.
- The course consists also in a series of lab sessions, where student will be required to run simple exercises consisting in modeling and solving simple problems by means of AI techniques and tools, and to solve simple exercises by hand.

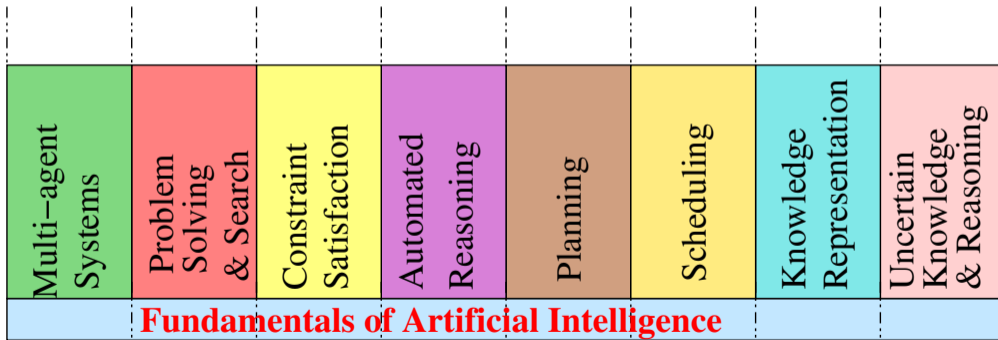
Notice: “lab” here means “exercise session”: no programming or use of tools.

Motivations & Goals (cont.)

Main goal

Provide the main formalisms and algorithms which build the foundations of many AI disciplines

⇒ Unlike other AIS courses, *Fundamentals of AI* is very wide and shallow.



Covered Topics

The main topics covered in the course are (not necessarily in order):

- Introduction to AI
- Intelligent Agents
- Problem Solving & Search
- Constraint Satisfaction
- Logic & Logical Agents
- Automated Inference & Reasoning
- Automated Planning
- Knowledge Representation
- Uncertain Knowledge and Reasoning

Topics (cont.)

Un-covered Topics

The following topics will *not* be covered in the course

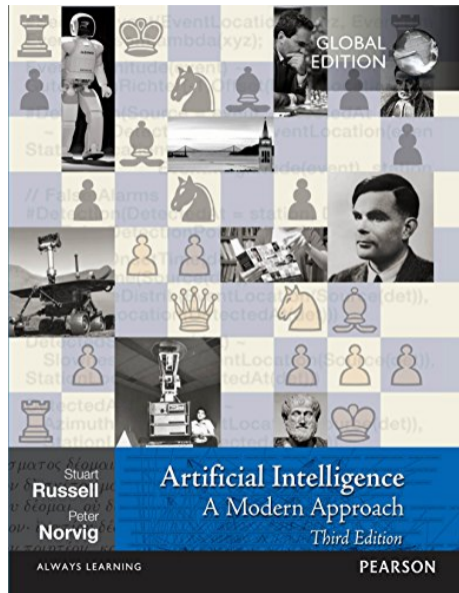
- **Machine Learning** (\implies ad-hoc courses)
- **Natural-Language & Speech** (\implies ad-hoc courses)
- **Image Recognition & Computer Vision** (\implies ad-hoc courses)
- **Robotics** (\implies ad-hoc courses)
- **AI & NeuroScience** (\implies ad-hoc courses)
- **Ethics in AI** (\implies ad-hoc course)
- **AI & Philosophy**
- **AI & Psychology**
- ...

References & Material

- Your notes from the lessons
- Slides
 - available from [the URL of the course](#)
 - starting from last year' versions, will be progressively updated
⇒ check the last-update date in the front slide of each chapter
- Other material
 - available from [the URL of the course](#)
- The textbook:
Stuart Russell & Peter Norwig.
["Artificial Intelligence. A Modern Approach"](#), Pearson. (a.k.a. "AIMA")
[3rd Edition](#) or [4th Edition](#).
- Supplementary material from the [AIMA URL](#)

About the AIMA Book

- Leading textbook in AI
- Adopted by over 1400 schools in over 120 countries.
- Lots of extra material & documentation
- Fundamental book in a AI professional's bookshelf
- Currently [3rd Edition](#) or [4th Edition](#)
- Electronic versions available



Acknowledgments & Disclaimer

- Many examples & figures in these slides are from the AIMA book (3rd edition)
 - Some other material presented in these slides (text, figures, examples) is courtesy of the following people, listed in alphabetical order:
 - Pieter Abbeel
 - Anca Dragan
 - Dan Klein
 - Nikita Kitaev
 - Tom Lenaerts
 - Michela Milano
 - Dana Nau
 - Maria Simi
 - ... (possibly others to be added)
- and, of course,
- Stuart Russell & Peter Norvig

Requirements

- It is assumed some basic background in the following topics:
 - basic mathematics
 - probability theory
 - algorithms and data structures
 - programming
- Some background in the following topics could be useful (but not necessary):
 - Boolean logic
 - automata and formal languages
 - software engineering

Note

The adopted textbook “Artificial Intelligence. A Modern Approach” provides appendixes with mathematical background and some notes on languages and algorithms.

Exam

- The exam will consist in a script session, with a combination of multiple-answer questions, brief open questions, and small exercises,
- Aims at assessing the acquired knowledge about both the main concepts and the main techniques.
- The final evaluation will consider both the acquired knowledge and the acquired skills in solving small exercises.
- Depending on various circumstances, the exam modalities might be subject to variations, which in case will be communicated to students in due time.

The exam will be taken solely in IN PRESENCE, remote exams are not envisaged.

To copy at exams very dangerous is!



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