

Foundations of Artificial Intelligence

Chapter 00: **Course Overview**

Roberto Sebastiani

DISI, Università di Trento, Italy – `roberto.sebastiani@unitn.it`

`https://disi.unitn.it/rseba/DIDATTICA/fai\_2026/`

Teaching assistant: **Nicola Debole**, `nicola.debole@unitn.it`,

M.S. Course “Artificial Intelligence Systems”, academic year 2026-2027

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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 10th–December 23rd**

- CLASS: Monday 09.30-11.30, Room A109 (Povo 1)
- LAB: Wednesday 11.30-13.30, Room A102 (Povo 1)
- CLASS: Friday 09.30-12.30/13.30, Room A207 (Povo 1) ^a

^a Typically a 3-hour class. The four hour-slot may be used to catch up with some missed class

The course is given solely in presence.

Intermediate tests ("prove in itinere")

Tentative dates (to be confirmed):

- November 5th, 2026
- December 21th, 2026

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 assistant
- use as subject “[Foundations of AI]: subject”
- email only from your “official” UNITN email address “name.surname@studenti.unitn.it”
⇒ emails coming from other sources **will be ignored**
- 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](#))

Important: Role of Video Recordings

Disclaimer

Class video recordings are not mandatory for teachers. Nevertheless, I have decided to go on providing the recordings of classes, which will be available from my personal web page.

This said, I wish to clarify the following facts.

- There is no guarantee on the quality of video-recording (in particular of the audio), nor on the full coverage of the class period. (It has happened in the past that some pieces of the class got lost due to technical problems.)
- Video recordings just display slides with teacher voice on background. To this extent, they are not meant to cover any text written on the blackboard.
- When students ask questions, they may or may not be recorded in the recording, depending on the position of the microphone.

Remark

- **Video recordings are not meant to substitute classes.** Rather, they are intended to provide some "extra support" to students, who may want to listen again some part of interest
- From previous exam results, **there is a clear correlation between exam success and class attendance in presence.**

Material & Useful Links

- **Course main page:**

https://disi.unitn.it/rseba/DIDATTICA/fai_2026/

- **Syllabus:**

https://disi.unitn.it/rseba/DIDATTICA/fai_2026/SLIDES/00SYLLABUS

- **Slides/Handouts:**

https://disi.unitn.it/rseba/DIDATTICA/fai_2026/SLIDES/

- **Class Video recordings:**

https://disi.unitn.it/rseba/DIDATTICA/fai_2026/CLASS-VIDEO-RECORDINGS/

- **Some Previous exams:**

https://disi.unitn.it/rseba/DIDATTICA/fai_2026/PREVIOUS-EXAMS/

- **The Moodle platform**

<https://didatticaonline.unitn.it>

- **AIMA Book material, 4th Edition:**

<http://aima.cs.berkeley.edu/>

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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 (and bearing walls) 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.

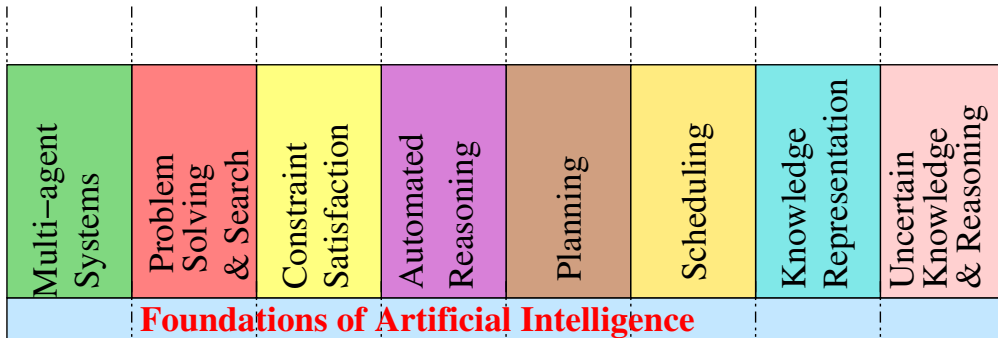
Notice: “lab” here means “exercise session”: no programming or use of tools.

Motivations & Goals (cont.)

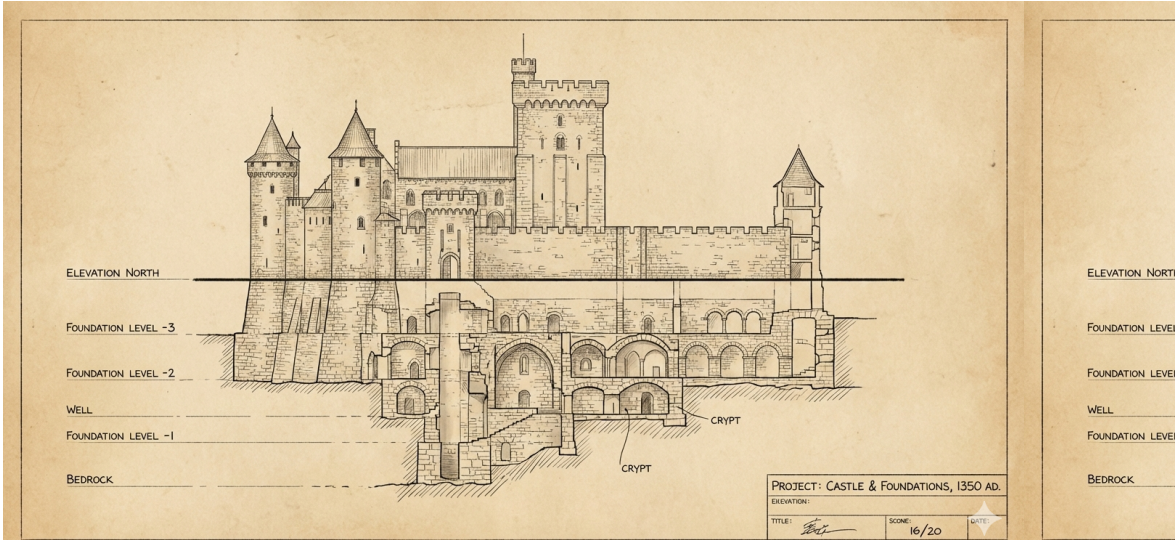
Main goal

Provide the main formalisms and algorithms which build the foundations (and the bearing walls) of many AI disciplines

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



The Foundations (and the Bearing Walls) of The AI Castle



Topics

Covered Topics

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

- Introduction to AI (Ch. 1 AIMA) ^a
- Problem Solving & Search (Ch. 3, 4, 6 AIMA)
- Constraint Satisfaction (Ch. 5 AIMA)
- Logic & Logical Agents (Ch. 7, 8 AIMA)
- Automated Inference & Reasoning (Ch. 5, 8 AIMA)
- Knowledge Representation (Ch. 10 AIMA)
- Automated Planning (Ch. 11 AIMA)

^a Russell & Norvig. "Artificial Intelligence. A Modern Approach", . (See later)

Remark

Wrt. a.a. 2025/26, a couple of topics removed:

- Intelligent Agents (Ch. 2 AIMA): hints only $\implies$ ad-hoc courses
- Quantifying Uncertainty (Ch. 13 AIMA) $\implies$ ML courses

Topics (cont.)

Un-covered Topics

The following topics will not be covered in the course

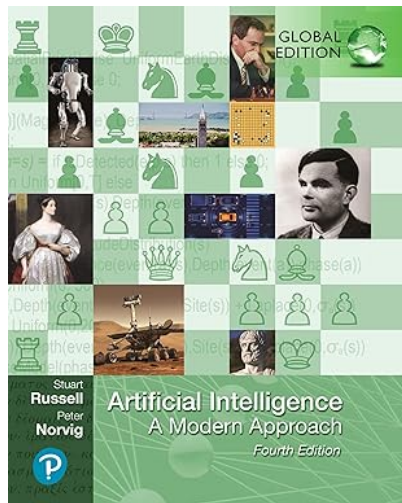
- Machine Learning & Deep Learning $\implies$ ad-hoc courses
- Natural-Language & Speech $\implies$ ad-hoc courses
- Large Language Models $\implies$ ad-hoc courses
- Image Recognition & Computer Vision $\implies$ ad-hoc courses
- Robotics $\implies$ ad-hoc courses
- AI & NeuroScience $\implies$ ad-hoc 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")
[4th Edition](#) (also [3rd Edition](#) is ok).
- 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 4th Edition
- Electronic versions available



Acknowledgments & Disclaimer

- Many examples & figures in these slides are from the AIMA book (3rd or 4th 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.

One remark: Algorithms

Remark

- In this course you will learn lots of algorithms
 - descriptions (e.g. pseudo-code)
 - example executions
 - features: properties, complexity, ...
- All algorithms are a fundamental part of the course program
⇒ they will be asked at the exam

How to study an algorithm (for non-computer-scientists)

- Avoid frequent mistake: **Do not memoize it as a text!**
- Rather, **learn** it as an algorithm:
 - (i) **Understand** it (fundamental ideas, data structures, schema, complexity, properties)
 - (ii) **Try it on examples!!**
 - (iii) **Memoize** fundamental ideas, data structures, schema, complexity, properties

Hint: After properly doing steps (i) and (ii), step (iii) comes nearly for free.

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 the main concepts and 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.
- There will be five exam sessions, on January, February, June, July, and September. The dates, times and rooms will be announced a few months in advance.
- Intermediate tests ("prove in itinere") may be envisaged.

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

Exams can be taken only in the official exam sessions, and only with the previously-established modalities. NO EXCEPTIONS ARE ENVISAGED.

Votes are not subject to negotiation.

Certified Specific Learning Disorders or Special Education Needs

Students with certified Specific Learning Disorders or Special Education Needs (“DSA/BES”) should contact us privately via email a few days before the exam.

To copy at exams very dangerous is!



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