Course syllabus

Artificial Intelligence
Artificiell intelligens

TFRP20, 7.5 credits, A (Second Cycle)

Valid for: 2026/27
Faculty: Faculty of Engineering LTH
Decided by: PLED C/D
Date of Decision: 2026-04-16
Effective: 2026-09-15

General Information

Depth of study relative to the degree requirements: Second cycle, in-depth level of the course cannot be classified
Language of instruction: The course will be given in English

Aim

To give an introduction to several subdomains of artificial intelligence and to give an orientation about fundamental methods within these domains. To convey knowledge about breath and depth of the domain. To provide insight about the ethical consequences of AI-based technology.

Learning outcomes

Knowledge and understanding
For a passing grade the student must

- display basic knowledge concerning theories and methods related to the following subdomains: intelligent agents, heuristic search, game programming, knowledge representation, knowledge-based systems, probabilistic reasoning, various machine learning approaches, natural language processing.

Competences and skills
For a passing grade the student must

- complete a number of assignments based on problems related to some of the following subdomains: heuristic search, knowledge-based systems, probabilistic reasoning, machine learning, natural language processing.
- demonstrate ability to critically, autonomously and creatively identify, formulate and handle problems requiring algorithms belonging to AI

Judgement and approach
For a passing grade the student must

- demonstrate ability to acquire additional knowledge and to continuously develop new skills.
- demonstrate ability to critically judge the ethical and societal consequences of using AI in particular context.

Contents

Intelligent agents. Heuristic search. Adversarial search. Knowledge based systems. Machine learning. Natural language. Semantic Web. Probabilistic reasoning. Intelligent robots. Planning. Ethics of AI.

Examination details

Grading scale: TH - (U, 3, 4, 5) - (Fail, Three, Four, Five)
Assessment:

For a passing grade an approved written exam and passed assignments are required. The final grade of the course is based on the result of the written examination.

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

Modules
Code: 0126. **Name:** Compulsory Course Items.
Credits: 3.0. **Grading scale:** UG - (U, G). **Assessment:** To qualify for a passing grade the assignments must be completed. **The module includes:** Assignments related to some of the treated subdomains are implemented to give practical experience of difficulties such as computational complexity, scalability and result interpretation. **Further information:** Details regarding the compulsory assignments will be found in the course program (syllabus) at the course web site.
Code: 0226. **Name:** Exam.
Credits: 4.5. **Grading scale:** TH - (U, 3, 4, 5). **Assessment:** To qualify for the exam all assignments must be completed and submitted in assessable state. The final grade of the course is based on the result of the written examination. **The module includes:** Written exam

Admission

Admission requirements:

- 90 credits, of which completed course corresponding to EDAA01 or TFRD49 or FRTF25. English 6.

Assumed prior knowledge: courses / knowledge corresponding to FMAB65 Calculus in One Variable B1, FMAB70 Calculus in One Variable B2, FMAB20 Linear Algebra and FMAB30 Calculus in Several Variables.

The number of participants is limited to: No
Kursen överlappar följande kurser: EDAP01 EDAF70 EDA132

Reading list

- Stuart Russell, Peter Norvig: Artificial Intelligence - A Modern Approach. Pearson Education, 2021, ISBN: 13 978-1-292-40113-3 / 101-292-40113-3. 4th edition, recommended textbook.

Contact

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Course homepage: https://cs.lth.se/tfrp20/

Further information

The course requires knowledge in basic mathematics equivalent to FMAB65 Calculus in One Variable B1, FMAB70 Calculus in One Variable B2, FMAB20 Linear Algebra and FMAB30 Calculus in Several Variables.