

COURSE SYLLABUS

Artificial Intelligence, 7.5 credits

Artificial Intelligence, 7.5 högskolepoäng

Course Code:	TARI29	Education Cycle:	Second-cycle level
Confirmed:	Feb 01, 2025	Disciplinary domain:	Technology
Valid From:	Sep 01, 2025	Subject group:	Computer Technology
		Specialised in:	A1N Second cycle, has only first-cycle course/s as entry requirements
		Main field of study:	Computer Science

Intended Learning Outcomes (ILO)

On completion of the course the student shall:

Knowledge and understanding

- Display knowledge of search algorithms for production systems
- Display knowledge of formalisms for reasoning under uncertainty
- Show familiarity with game theory and its applications in AI

Skills and abilities

- Demonstrate the ability to apply production systems, and the accompanying search algorithms to various representations and problem instances
- Demonstrate the ability to develop computer programs that handle the concepts addressed in the course, including evolutionary computation
- Demonstrate the ability to use resolution for inferencing in predicate and propositional logic
- Demonstrate the ability to implement the minimax algorithm, including some standard improvements
- Demonstrate the ability to implement algorithms for finding optimal policies in Markov decision processes

Judgement and approach

- Demonstrate an understanding of how representations and algorithms can be used for solving basic AI-problems described in a formal or informal way.

Content

The course is a basic course in artificial intelligence with a focus on traditional AI, i.e., GOFAI. The course covers many different basic and intermediate topics in the field, alternating theory with practice. After completing the course, the student shall have acquired a basic, but broad, knowledge in the field of artificial intelligence. Specifically, the student should understand and know how to apply all the theoretical concepts covered.

The main concepts included in the course are:

- Traditional AI: Problem representation, production systems, search with and without heuristics, planning, expert systems, automated reasoning, propositional logic, predicate logic, resolution
- Reasoning under uncertainty: Bayesian inferencing and other approaches
- Programming of an evolutionary solution for an optimization problem in a programming language of own choice
- Intelligent agents: terminology, environments, different types of agents
- Basic game theory, the minimax algorithm, agents for game playing

- Agents for Markov decision processes

Type of instruction

The teaching in the course consists mainly of lectures, assignments and tutoring.

Language of instruction is in English.

Entry requirements

The applicant must hold the minimum of a bachelor's degree (i.e the equivalent of 180 ECTS credits at an accredited university) with at least 90 credits in Computer Engineering, Computer Science or Electrical Engineering (with relevant courses in computer engineering), or equivalent, or passed courses at least 150 credits from the programme Computer Science and Engineering. The bachelor's degree should comprise a minimum of 15 credits in mathematics. Proof of English proficiency is required.

Examination and grades

The course is graded 5, 4, 3 or U.

The final grade for the course is based upon a balanced set of assessments. The final grade will only be issued after satisfactory completion of all assessments.

Registration of examination:

Name of the Test	Value	Grading
Examination	5 credits	5/4/3/U
Assignment	2.5 credits	5/4/3/U

Course literature

Please note that changes may be made to the reading list up until eight weeks before the start of the course.

The principal texts:

Title: Artificial Intelligence a modern approach, 3rd ed

Author: Russel, S. & Norvig, P.

Publisher: Pearson Education Ltd.

ISBN: 978-0132071482