

Program	Level		First cycle				
	Name of the program		Theoretical Computer Science				
COURSE							
Course title	Introduction to Artificial Intelligence						
Course code	Semester	Course status		ECTS	Contact hours (L+AE+LE)		
CS 395	VI	Elective course		5	2+0+2		
Lecturer							
Course Goals	<p>The main research topics in AI include: problem solving, reasoning, planning, natural language understanding, computer vision, automatic programming, machine learning, and so on. Of course, these topics are closely related with each other. For example, the knowledge acquired through learning can be used both for problem solving and for reasoning. In fact, the skill for problem solving itself should be acquired through learning. Also, methods for problem solving are useful both for reasoning and planning. Further, both natural language understanding and computer vision can be solved using methods developed in the field of pattern recognition.</p> <p>In this course, we will study the most fundamental knowledge for understanding AI. We will introduce some basic search algorithms for problem solving; knowledge representation and reasoning; pattern recognition; fuzzy logic; and neural networks.</p>						
Learning Outcomes	<p>The main purpose of this course is to provide the most fundamental knowledge to the students so that they can understand what the AI is. Due to limited time, we will try to eliminate theoretic proofs and formal notations as far as possible, so that the students can get the full picture of AI easily. Students who become interested in AI may go on to the graduate school for further study.</p>						
COURSE CONTENT							
<p>Introduction, Intelligent Agents Problem Solving: Solving Problems by Searching, Beyond Classical Search, Adversarial Search, Constraint Satisfaction Problems Knowledge and Reasoning: Logical Agents, First-Order Logic, Fuzzy Logic: Inference in First-Order Logic, Inference in Fuzzy Logic, Classical Planning, Planning and Acting in the Real World, Knowledge Representation Uncertain Knowledge and Reasoning: Quantifying Uncertainty, Probabilistic Reasoning, Probabilistic Reasoning over Time, Making Simple Decisions, Making Complex Decisions Communicating, Perceiving, and Acting: Natural Language Processing, Natural Language for Communication, Perception, Robotics</p>							
LITERATURE							
<p>[1] Stuart Russel, Peter Norvig: Artificial Intelligence: A Modern Approach, Prentice Hall, 2009 (1995). [2] Elaine Rich, Kevin Night: Artificial Intelligence, McGraw-Hill, 1990. [3] Rolf Pfeifer and Christian Scheier: Understanding Intelligence, MIT Press, 1999. [4] George F. Luger: Artificial Intelligence: Structures and Strategies for Complex Problem Solving. Addison-Wesley, 2008. [5] Blay Whitby: Artificial Intelligence, Oneworld Publications, 2003. [6] Lecture notes</p>							
STUDENT WORKLOAD (hours in a semester)							
Lectures	30	Exercises	30	Individual work	65	Total	125
GRADING				REMARKS			
Criterion	Maximum points	Minimum points					
Midterm exams	5	3					
Homework	5	3					
Projects	40	21					
Seminar	5	3					
Final exam	45	25					
Total	100	55					