BSc Computer Science and Engineering

Syllabus

Subject	**Computer Networks and Communication**			
	Type	**Semester**	**ECTS**	**Code**
	OBLIGATORY (O)	3	5	
Course Lecturer **Course Assistant** **Course Tutor**	Dr. Sc. Lavdim Beqiri			
Aims and Objectives	This course is the primary introduction to artificial intelligence. It presents the basic concept of representation, reasoning and learning paradigms used in AI, in both theory and practice including principles of logic and search. It is also designed to show students practical examples of the use of AI in complex real-world problems that span across various practices of engineering!			
Prerequisite(s)	Recommended: Algorithms and basic skills of programming			
Learning Outcomes	Upon completion of the semester, the student is expected to achieve the following results: - Have an understanding of space search and search algorithms, logic based knowledge representation, of issues in reasoning methods. - Explain concisely the scope of AI, its potential for society as well as its limitations - Have an understanding of the limitations of current symbolic AI paradigm - Be able to select appropriate search paradigms for appropriate problems - Design formal problems in AI and identify important features and properties - Be able to design a simple agent system and associated ontology and justify the design - Correctly determine which AI technique(s) should be used to solve a particular problem - if any Design software agents that act rationally in complex domains - Discuss contemporary applications of AI from both a technical and an ethical perspective			
Course Content	**Course Plan**			**Week**
	Introduction to AI (what is AI? Foundations of AI).			1
	Intelligent agents (what is an agent? structure of agents)			2
	Intelligent agents (types of agents, environments).			3
	Problem Solving (search algorithms, understand the search problems and their algorithms)			4
	Problem Solving (introduce search algorithms, informed and uninformed search algorithms).			5
	Problem Solving (best-first search, A* search algorithm).			6
	Planning and Decision Making			7
	Knowledge representation			8
	Learning			9
	Expert System (Introduction, components of an expert system).			10
	Expert System (compare between human thinking and computer thinking, rules-based systems).			11
	Expert System (examples of well-known expert systems, strategies in expert systems, develop an expert system).			12
	Intro to Machine Learning			13
	Neural Networks			14
	Smart applications using AI			15
Teaching/Learning	**Teaching/Learning Activity**			**Weight (%)**

Methods	1. Lectures			20%
	2. Group Project			20%
	3. The firs test			20%
	4. Exam			40%
Assessment Methods	**Assessment Activity**	**Number**	**Week**	**Weight (%)**
	1. Participation in lectures	5	1-12	20%
	2. Participation in exercises		2-12	20%
	3. Group Project (2 students)		7	20%
	4. Final exam		14	40%
Course resources	**Resources**			**Number**
	1. Classes			1
	2. Moodle			1
	3. Laboratory			1
	4. Software: Anaconda Navigator			1
	5. Projector			1
ECTS Workload	**Activity**		**Weekly hrs**	**Total workload**
	1. Lectures		2	30
	2. Seminars			
	3. Laboratory		2	30
	4. Practice in industry			
	5. Independent learning		5	88
	6. Final Exam		1	2
Literature/References	- *Stuart J. Russell and Peter Norvig* – "Artificial Intelligence: A Modern Approach" - *Aarup, M., Arentoft, M. M., Parrod, Y., Stader, J., and Stokes, I. (1994).* OPTIMUM-AIV: A knowledge-based planning and scheduling system for spacecraft AIV. In Fox, M. and Zweben, M. (Eds.), Knowledge Based Scheduling. Morgan Kaufmann. - *Blei, D. M., Ng, A. Y., and Jordan, M. I.* (2001). Latent Dirichlet Allocation. In Neural Information Processing Systems, Vol. 14. - *Boyan, J. A. and Moore, A. W.* (1998). Learning evaluation functions for global optimization and Boolean satisfiability. In AAAI-98. - *Dreyfus, H. L.* (1972). What Computers Can't Do: A Critique of Artificial Reason. Harper and Row.			
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