INF-50306 - Artificial Intelligence

(Capita Selecta Information Technology)

Credits 6.0

Teaching method	**Contact hours**
Lecture	30
Group work	12

Lecturer(s)
Prof.dr.ir. B. Tekinerdogan
Dr. J. Valente
Dr. T. Alskaif
Dr. K.E. Bennin
Dr. W. Hurst
Dr. A. Kassahun
Dr. Q. Liu

Course Coordinators
prof.dr.ir. B .Tekinerdogan
Dr. J. Valente

Course Examiners
Prof.dr.ir. B Tekinerdogan
Dr. J. Valente

Language of instruction
EN

Assumed prerequisite knowledge on
This course assumes no specific technical knowledge and can be followed by any student who wishes to acquire a vision on the key concepts related to Artificial Intelligence.

Contents
An increasing number of businesses will adopt Artificial Intelligence (AI) to enhance their decision making processes. No doubt, AI will have a further transformative, far-reaching implications for the society that requires close attention. The primary objective of this course is to provide the basic understanding of the AI concepts and their implications. The course will introduce the basic principles, techniques, and applications of AI. Emphasis will be placed on the teaching of the concepts, not on providing a mastery of particular software tools or programming environments. Coverage includes knowledge representation, intelligent agents, AI applications, problem solving, search algorithms, machine learning, deep learning, reinforcement learning, robotics in AI, and AI ethics.

Learning outcomes
After successful completion of this course students are expected to be able to:

- Explain different types of AI agents.
- Identify the benefits of using AI-based systems.
- Recognise various AI search algorithms, e.g., uninformed, informed, heuristic, constraint satisfaction.
- Compare the fundamentals of knowledge representation, e.g., logic-based, semantic networks, inference.
- Identify key machine learning approaches and algorithms.
- Identify reinforcement learning.
- Know how to build simple knowledge-based systems.
- Identify neural networks and deep learning techniques
- Outline different robotic systems and applications
- Understand various ethics and governance, to ensure successful AI project delivery.

Course materials and resources

The following textbook will be used:

Artificial Intelligence: A Modern Approach
by Stuart Russell, Peter Norvig

Additional papers will be used to cover the course topics.

Course Schedule

Week 1	**Topic**	**Instructor**
Mon	Introduction to AI	Bedir Tekinerdogan
Wed	Intelligent Agents	Joao Valente
Fri	Knowledge, Reasoning and Planning	Ayalew Kassahun
Week 2		
Mon	AI Applications and Problem Solving	Will Hurst
Wed	Machine Learning Concepts	Tarek Alskaif
Fri	***Quiz 1***	
Week 3		
Mon	Neural Networks and Deep Learning	Kwabena Ebo Bennin
Wed	Reinforcement Learning	Qingzhi Liu
Fri	Robotics in AI	Joao Valente
Week 4		
Mon	Ethics in AI	Bedir Tekinerdogan
Wed	Student Project Presentations	Bedir Tekinerdogan/ Joao Valente
Fri	***Quiz 2***	

Examination
- essays and reports (50%);
- written exam (50%).
Each component needs a minimum mark of 5.5 to pass.