

Artificial Intelligence (CUE)

1. Information on the Programme

1.1. Higher Education Institution	Cihan University Sulaymaniyah
1.2. College	Science
1.3. Department	Computer Science
1.4. Field of Study	Artificial Intelligence
1.5. Cycle of Study¹	1
1.6. Specialization/ Study Programme	Computer Science
1.7. Form of Education	Full Time

2. Information on the Discipline

2.1. Discipline Name	Artificial Intelligence						
2.2. Code							
2.3. Language:	English						
2.4. (Theory) Lecturer	Assistant Lecturer Sherko Hamalaw Murad E-mail: sherko.murad@sulicihan.edu.krd Tel: (+964)-07702452429						
2.5. Practical/Seminar/ Laboratory/ Project Lecturer	Assistant Lecturer Sherko Hamalaw Murad e-mail: sherko.murad@sulicihan.edu.krd Tel: (+964)-07702452429						
2.6. Year of Study	Third	2.7 Semester	Five	2.8. Assessment Type²	Written exam	2.9. Discipline Status	Content ³
							CD
							Mandatory ⁴
							MD

3. Total estimated time (Teaching Hours per Semester)

Total Contact Hours:	52										
Total Self Study Hours:	110										
Total No. Hours:	162										
ECTS:	06										
No. of Weeks	Contact Hours					Self-Study					
	Theoretical	Practical	Lab.	Project	Visit	Quiz	Reading	Assignment	Report	Midterm Exam.	Final Exam.
1 st Week (Registration)	-	-	-	-	-	-	-	-	-	-	-
2 nd Week	2	2					2				
3 rd Week	2	2				2	2	6			
4 th Week	2	2				2	2				
5 th Week	2	2				2	2		8		
6 th Week	2	2					2				
7 th Week	2	2					2				
8 th Week	2	2					2				
9 th Week	2	2				2	2	8			
10 th Week	2	2				2	2				
11 th Week	2	2					2				
12 th Week	2	2				2	2		8		
13 th Week	2	2				2	2				
14 th Week	2	2					2				
15 th Week (Final Exam.)											
16 th Week (Final Exam.)											
TOTAL	26	26				14	26	14	16	20	20

4. Prerequisites (if applicable)

4.1 Curriculum-Related	Introduction to Artificial Intelligence
4.2 Skills-Related	Programming (Python), Basic Mathematics, Teamwork and Continuous Learning

5. Conditions (if applicable)

5.1. For the Theoretical	-Read and comprehend the textbook material with examples. -Attend all the classes and take notes on class discussions. -Actively participate in class discussions and activities. -Submit all the assignments and reports on deadline. -Pass tests and quizzes.
5.2. For the Practical	All students are normally required to attend the Lab; take part in lectures through applying the exercises on the computer or as quizzes.

6. Cumulated Specific Competences

Professional Competencies	<p>Artificial Intelligence (AI) is the part of computer science concerned with designing intelligent computer systems, that is, systems that exhibit characteristics we associate with intelligence in human behaviors – understanding language, learning, reasoning, solving problems, and so on.”</p> <p>- Scientific Goal To determine which ideas about knowledge representation, learning, rule systems search, and so on, explain various sorts of real intelligence. -- Engineering Goal To solve real world problems using AI techniques such as knowledge representation, learning, rule systems, search, and so on.</p> <p>Traditionally, computer scientists and engineers have been more interested in the engineering goal, while psychologists, philosophers and cognitive scientists have been more interested in the scientific goal.</p> <p>.</p>
Transversal competences	Artificial Intelligence (AI) is a branch of computer science focused on creating systems capable of performing tasks that typically require human intelligence. These tasks include problem-solving, learning, perception, reasoning, and language understanding. AI systems are designed to simulate human cognitive processes, enabling them to perform complex functions autonomously or with minimal human intervention.

7. Discipline Objectives (Based on the cumulated specific Competences)

7.1. General Objective	The objectives of this course are:
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	science and technology are changing rapidly “old” sciences such as physics are relatively well-understood computers are ubiquitous, Grand Challenges in Science and Technology.
7.2. Specific Objectives	<p>understanding the brain</p> <ul style="list-style-type: none"> ▪ reasoning, cognition, creativity creating intelligent machines ▪ is this possible? ▪ what are the technical and philosophical challenges? <p>arguably AI poses the most interesting challenges and questions in computer science today.</p>

8. Content

Week	8.1. Theoretical-Number of Hours	Teaching methods	Observation
1	Registration		
2	Introduction to Artificial Intelligence <ul style="list-style-type: none"> - What is Intelligence - What is artificial intelligence - What is human intelligence - History of AI - Intelligent Agents - Some agent types 1-Table-driven agents 2-Simple reflex agents 3- Model-based reflex agents 4-Goal-based agents 5-Utility-based agents - Summary: Agents 	lecture	1 lecture = 2 hours
3	<ul style="list-style-type: none"> - Artificial Intelligence Applications 1.Expert System” ES” 2.Natural Language Processing 3. Speech Recognition 4. Computer Vision 5. Robots 6. Machine learning 7. Neuronal Network and Deep learning 8. Speech recognition 9. image proceeding 10. Cognitive computing 	lecture	1 lecture = 2 hours

4	<p>Solving Problems by Searching</p> <p>1 Problem-Solving Agents.</p> <p>2 Example Problems.</p> <p>3 Search Algorithms.</p> <p>4 Uninformed Search Strategies.</p> <p>5 Informed (Heuristic) Search Strategies.</p> <p>6 Heuristic Functions</p>	lecture	1 lecture = 2 hours
5	<p>Uninformed Search Strategies</p> <ul style="list-style-type: none"> - Breadth-First search - Depth-First search - Uniform-Cost search - Depth-First Iterative Deepening search <p>Informed Search Strategies</p> <p>Hill climbing</p> <p>Best-first search</p> <p>Greedy Search</p> <p>Beam search</p> <p>Algorithm A</p> <p>Algorithm A*</p>	Lecture	1 lecture = 2 hours
6	<p>Data, Information & Knowledge</p> <ul style="list-style-type: none"> - Data - Data Into Information - Information - Knowledge - Knowledge Examples - Knowledge Classification <p>Knowledge pyramid</p>	Lecture	1 lecture = 2 hours
7	MIDTERM EXAM 1		
8	<p>Knowledge</p> <ul style="list-style-type: none"> - Knowledge Examples - Knowledge Classification - Knowledge pyramid 	Lecture	1 lecture = 2 hours
9	<p>Knowledge Representation Schemas</p> <ul style="list-style-type: none"> 1- Logic based representation – First Order predicate logic. 2- Procedural representation – rules, production system. 3- Network representation – semantic networks conceptual graphs. 4- Structural representation – scripts, frames, objects 	Lecture, Quiz	1 lecture = 2 hours
10	<p>Problem solving using state space:</p> <p>Introduction,</p> <p>Concepts and state space search,</p> <p>Data driven and goal driven</p>	Lecture	1 lecture = 2 hours

11	Blind search (depth- first search)	lecture	1 lecture = 2 hours
12	Blind search (breadth- first search)	lecture	1 lecture = 2 hours
13	Heuristic search (hill climbing algorithm)	lecture	1 lecture = 2 hours
14	Heuristic search (best- first search)	lecture	1 lecture = 2 hours

week	8.2. Practical Works–Number of Hours	Observation
1	Registration	
2	Lecture	1 lecture = 2 hours
3	Lecture	1 lecture = 2 hours
4	Lecture	1 lecture = 2 hours
5	Lecture, assignment	1 lecture = 2 hours
6	Lecture	1 lecture = 2 hours
7	MIDTERM EXAM 1	2 hours
8	Lecture	1 lecture = 2 hours
9	Lecture	1 lecture = 2 hours
10	Lecture	1 lecture = 2 hours
11	MIDTERM EXAM 2	2 hours
12	Lecture	1 lecture = 2 hours
13	Lecture	1 lecture = 2 hours
14	Lecture	1 lecture = 2 hours

Compulsory bibliography: Key references:

1. Fundamentals of Computer Programming with C# by Svetlin Nakov.

2. C# Yellow Book by Rob Miles.

Optional Bibliography:

C# Programming for the Absolute Beginner" by Andy Harris

9. Assessment

Type of Activity	9.1. Assessment Criteria ²	9.2. Assessment Type	9.3. Percentage of the final Grade
9.4. Theoretical	Mid-term (30%)	Exam	%30
9.5. Practical/ Seminar/Laboratory	Final-Exam (50%)	Exam	%40
9.6. Activity during Semester	Quizzes (10%) Assignment (5%) Attendance (5%) Project (10%)	Exam	%30

Minimum performance Standards: basic knowledge of hardware and software with basics of java language.

Theoretical Lecturer	Assistant Lecturer Ardalan Husain Awlla
Practice Lecturer	Assistant Lecturer Ardalan Husain Awlla

Approved by the Curriculum development Committee:

1	Asst Prof Dr. Lway Faisal Abdulrazak
2	
3	
Head of the Department/ Dean	Asst Prof Dr. Lway Faisal Abdulrazak