Faculty: Information Technology	
Department: Computer Science	**Program: Master**
Academic year: 2023 / 2024	**Semester: 1st**

Course Plan

First: Course Information

Course No.: 1306781	*Course Title: Applications of Artificial Intelligence*	*Credit Hours: 3*	*Theoretical: 3*	*Practical: -*
Prerequisite No. and Title: -	*Section No.: 1*	*Lecture Time: Fri. 9:00 – 12:00*		
Level in JNQF	*9*			
Type Of Course:	☐ *Obligatory University Requirement* ☐ *Elective University Requirement* ☐ *Obligatory Faculty Requirement* ☐ *Elective Faculty Requirement* ■ *Obligatory Specialization Requirement* ☐ *Elective Specialization Requirement* ☐ *Ancillary course*			
Type of Learning:	☐ *Face-to-Face Learning* ☐ *Blended Learning (2 Face-to-Face + 1 Asynchronous)* ■ *Online Learning (1 Synchronous+ 1 Asynchronous)*			

Second: Instructor's Information

Course Coordinator				
Name: Dr. Ala'a M. Al-Shaikh	*Academic Rank: Assistant Professor*			
Office Number: 223B	*Extension Number: 1337*	*Email: ashaikh@zu.edu.jo*		
Course Instructor:				
Name: Dr. Ala'a M. Al-Shaikh	*Academic Rank: Assistant Professor*			
Email: ashaikh@zu.edu.jo	*Extension Number: 1337*	*Email: ashaikh@zu.edu.jo*		
Office Hours:	*Sunday 12:00-1:00*	*Monday -*	*Tuesday 12:00-1:00*	*Wednesday -*	*Thursday 12:00-1:00*

Third: Course Description

The successful student will finish the course with specific modeling and analytical skills (e.g., search, logic, probability), knowledge of many of the most important knowledge representations, reasoning, and a general understanding of AI principles and practices. Artificial Intelligence spans various topics at the forefront of computer science research, including areas like machine learning, robotics, planning, computer vision, natural language processing, and many others. This course serves as a broad introduction to many of these topics but is taught at the graduate level, where students will delve into specific algorithms and applications in significant detail.

Fourth: Course Objectives

1. Formulate real-world problems as search problems.
2. Identify the computational bottlenecks of different problem-solving algorithms.
3. Illustrate the three types of machine learning.
4. Use machine learning algorithms, such as Support vector machines, decision trees, neural networks, and linear regression.

Fifth: Learning Outcomes

Level descriptor according to (JNQF)	*CILOs Code*	*CILOs* If any CLO will not be assessed in the course, mark NA.	*Associated PILOs Code* *Choose one PILO for each CILO**	*Assessment method* *Choose at least two methods*
Knowledge	**K1**	Identify the different Application areas of AI	**PK1**	• Quiz • Group Presentation • Final Exam
	K2	Identify the concept of problem-solving, such as exhaustive search techniques, and heuristic and metaheuristic search techniques.	**PK2**	• Quiz • Group Presentation • Final Exam
	K3	Define machine learning and its types.	**PK3**	• Quiz • Group Presentation • Final Exam
Skills	**S1**	Build metaheuristic solutions to well-known optimization problems.	**PS3**	• Asynchronous Activities Group Presentation • Final Exam
	S2	Build machine-learning models to mimic how humans learn.	**PS5**	• Asynchronous Activities Group Presentation • Final Exam
	S3	Compare the performance of machine-learning models in terms of accuracy, precision, recall, and F1 score.	**PS4**	• Asynchronous Activities Group Presentation • Final Exam
Competencies	**C1**	Choose the appropriate mathematical model for any given problem in artificial intelligence.	**PC5**	Research Proposal
	C2	Write a research paper related to artificial intelligence.	**PC4**	Research Proposal

*CILOs: Course Intended Learning Outcomes; PILOs: Program Intended Learning Outcomes; For each CILO, the PILO could be the same or different.

Sixth: Learning Resources

Main Reference:	Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow: Concepts, Tools, and Techniques to Build Intelligent Systems		
Author: Aurélien Géron	***Issue No.: 3rd***	***Print:***	***Publication Year: 2022***
Additional Sources and Websites:	• https://web.stanford.edu/group/sisl/k12/optimization/#!index.md		
Teaching Type:	☐ ***Classroom*** ☐ ***Laboratory*** ☐ ***Workshop*** ■ ***MS Teams*** ■ ***Moodle***		

Seventh: Course Structure

Lecture Date	Course Intended Teaching Outcomes (CILOs)	Topics	Teaching Procedures*	Teaching Methods**	References***
Week 1	-	Introduction	synchronous	Lecture	-
Week 2	K1	What is Artificial Intelligence (AI)?,	Asynchronous	Videos, reading	Chapter 1
Week 3	K2, S1	Uninformed Search	synchronous	Lecture	Website 1
Week 4	K2, S1	Informed Search	Asynchronous	Videos, reading	Website 1
Week 5	K2, S1	Optimization and Metaheuristic algorithms	synchronous	Lecture	Website 1
Week 6	K2, S1	Optimization and Metaheuristic algorithms	Asynchronous	Videos, reading	Website 1
Week 7	K3	Introduction to Machine Learning	synchronous	Lecture	Chapter 1
Week 8	K3	Introduction to Machine Learning	Asynchronous	Videos, reading	Chapter 2
Week 9	K3, S2	Classification	synchronous	Lecture	Chapter 3
Week 10	K3, S2, S3	Training Models	Asynchronous	Videos, reading	Chapter 4
Week 11	K3, S2, S3	Dimensionality Reduction	synchronous	Lecture	Chapter 3
Week 12	K3, S2, S3	Machine Learning algorithms	Asynchronous	Videos, reading	Chapter 5
Week 13	K2, S2, S3	Machine Learning algorithms	Asynchronous	Videos, reading	Chapter 6
Week 14	C1, C2	Research Project Presentation	synchronous	Research Proposal	-
Week 15	C1, C2	Research Project Presentation	synchronous	Research Proposal	-
Final Exam					

*Teaching procedures: (Face-to-Face, synchronous, asynchronous). ** Teaching methods: (Lecture, video….).
*** Reference: (Pages of the book, recorded lecture, video….)

Eighth: Assessment Methods

Methods	Online Learning	Blended Learning	Face-To-Face Learning	Specific Course Output to be assessed **If any CILO will not be assessed in the course, mark NA.							
				K1	K2	K3	S1	S2	S3	C1	C1
First Exam											
Second Exam											
Mid-term Exam											
Participation											
Asynchronous Activities	10						✓	✓	✓		
Quizzes	20			✓	✓	✓					
Research Proposal	20									✓	✓
Group presentation	10			✓	✓	✓	✓	✓	✓		
Final Exam	40			✓	✓	✓	✓	✓	✓		
Total out of 100	100										

Ninth: Course Policies

- All course policies are applied to all teaching patterns (online, blended, and face-to-face Learning) as follows:
  a. Punctuality.
  b. Participation and interaction.
  c. Attendance and exams.
- Academic integrity: (cheating and plagiarism are prohibited).

Approval	Name	Date	Signature
Head of Department	Dr. Hebatullah Khattab		
Faculty Dean	Prof. Mohammad Hassan		