The University of Jordan		**الجامعة الاردنية**

SUJ-01-05-01A	**رقم النموذج**	**نموذج**
	تاريخ الإصدار	**مخطط مادة دراسية/ انجليزي**
	رقم وتاريخ المراجعة أو التعديل	**Course Syllabus**
	رقم قرار اعتماد مجلس العمداء	
	تاريخ قرار اعتماد مجلس العمداء	
07	**عدد الصفحات**	

1.	**Course title**	Artificial Intelligence
2.	**Course number**	1905320
3.	**Credit hours**	3
	Contact hours (theory, practical)	3
4.	**Prerequisites/corequisites**	
5.	**Program title**	Artificial Intelligence
6.	**Program code**	
7.	**Awarding institution**	The University of Jordan
8.	**School**	King Abdullah II School of Information Technology
9.	**Department**	Artificial Intelligence
10.	**Course level**	Undergraduate
11.	**Year of study and semester (s)**	Spring 2023/2024
12.	**Other department (s) involved in teaching the course**	None
13.	**Main teaching language**	English
14.	**Delivery method**	☒Face to face learning ☐Blended ☐Fully online
15.	**Online platforms(s)**	☒Moodle ☒Microsoft Teams ☐Skype ☐Zoom ☐Others…………
16.	**Issuing/Revision Date**	October , 2024

17. Course Coordinator:

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18. Other instructors:

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19. Course Description:

Introduction to artificial intelligence (concepts, research areas and applications), Propositional logic, First order logic, Representing simple domains in First order logic, Logic programming (Prolog), Exhaustive search methods; Heuristic and evolutionary search methods; Production systems; Architecture of expert systems; Model- versus rule-based reasoning. Machine Learning and Data Mining (K-means clustering, nearest neighbor classification, Naive Bayesian, Decision trees).

20. Course aims and outcomes:

A- Aims:

The aim of the course is to enable students to solve problems using explicit knowledge and reasoning. Students will be able:

(1) to express knowledge of a simple domain in propositional and/or first order predicate calculus,

(2) design a solution to simple problems where AI techniques can be employed and

(3) write simple programs in Prolog that reason about the available knowledge to achieve their goals. Furthermore, student will have the ability to decide and use some appropriate search techniques (blind or heuristic) for some problems. Students will also be introduced to Machine Learning and Data Mining (K-means clustering, nearest neighbor classification, Naive Bayesian, Decision trees)

B- Students Learning Outcomes (SOs):

Upon successful completion of this course students will be able to:

SO(1).Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.

SO(2). Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.

SO(3). Communicate effectively in a variety of professional contexts.

On successfully completing the module, the students are expected to have gained good knowledge of:

Descriptors	ILO/ID	Program SOs / ILOs of the course	SO (1)	SO (2)	SO (3)
Knowledge	A1	Understand and explain fundamental AI concepts, research areas, and real-world applications.	■		
	A2	Understand and apply production systems and design expert systems architectures for specific applications.	■		
	A3	Understand fundamental concepts and techniques in machine learning and data mining.	■		
Skills	B1	Apply propositional and first order logic to solve logical problems and represent simple domains in AI.	■		
	B2	Design and implement logic programs using Prolog for problem-solving in AI.		■	
	B3	Understand and apply production systems and design expert systems architectures for specific applications	■		
Competence	C1	Apply exhaustive, heuristic, and evolutionary search methods to solve complex AI problems efficiently.		■	
	C2	Develop the ability to present AI-related technical information clearly and effectively in both written and oral forms.			■

21. Topic Outline and Schedule:

Week	Lecture	Topic	Intended Learning Outcome	Learning Methods (Face to Face/Blended/ Fully Online)	Synchronous / Asynchronous Lecturing	Evaluation Methods	Resources
1	1.1	-Welcome and Orientation - Introduction to artificial intelligence (concepts, research areas and applications)	A1	Face to Face	Synchronous	In-class Q/A Discussion	Slides
	1.2						
	1.3						
2	2.1						
	2.2						
	2.3						
3	3.1	- Propositional calculus and first order predicate logic. - Translation between logic and natural language texts	B1	Face to Face	Synchronous	Home works, Discussion	Synchronous lecture (MS-Team) Luger book + Notes, Exams
	3.2						
	3.3						
4	4.1						
	4.2						
	4.3						
5	5.1	Programming in PROLOG	B2 C2	Face to Face	Synchronous	In-class Q/A Home works Discussion	Slides, Notes
	5.2						
	5.3						
6	6.1						
	6.2						
	6.3						
7	7.1						
	7.2						
	7.3						
8	8.1	Blind and heuristic search techniques	C1	Face to Face	Synchronous	In-class Q/A Home works	Slides, Notes
	8.2						

	8.3						
9	9.1						
	9.2						
	9.3						
10	10.1	Production Systems + Example	A2, B3	Face to Face	Synchronous	In-class Q/A Discussion	Slides, Notes
	10.2						
	10.3						
11	11.1	Architecture of Expert Systems	A2, B3	Face to Face	Synchronous	In-class Q/A Discussion Home works	Slides, Notes
	11.2						
	11.3						
12	12.1	Rule-based vs Model based reasoning	B3	Face to Face	Synchronous	In-class Q/A Discussion	Slides, Notes
	12.2						
	12.3						
13	13.1	Introduction to machine learning and data mining	A3 C2	Face to Face	Synchronous	In-class Q/A Discussion	Slides, Notes
	13.2						
	13.3						
14	14.1	Naïve Bayesian	A3	Face to Face	Synchronous	In-class Q/A Discussion	Slides, Notes
	14.2	Decision trees					
	14.3	K-means clustering					
15	15.1	Nearest neighbour classification	A3	Face to Face	Synchronous	In-class Q/A Discussion	Slides, Notes
	15.2	Revision + Discussions		Face to Face		Discussion	Notes
	15.3						

22. Evaluation Methods:

Opportunities to demonstrate achievement of the SLOs are provided through the following assessment methods and requirements:

Evaluation Activity	Mark	Topic(s)	SLOs	Period (Week)	Platform
Assignments + Quizzes	20	Week 2 - Week 14	B2, C2	2-15	Moodle
Midterm	30	Week 1-Week7	B1, B2 C2	8	Paper Based
Final Exam	50	Week1-week15	All SLOs	15	JUEXAMS

23. Course Requirements

(e.g: students should have a computer, internet connection, webcam, account on a specific software/platform…etc):

Every student should visit the following site for course material, quizzes and announcements.

- Site address: elearning.ju.edu.jo
- MS Office 365

24. Course Policies:

A- **Attendance policies**: Every student is expected to attend all classes

B- **Absences from exams and submitting assignments on time**: Absence from exams is handled according to the University of Jordan's regulations. Students should completely adhere to the assignments and project strict deadlines, absolutely no exceptions will be given.

C- **Health and safety procedures**: Following standard policies and procedures of computer labs.

D- Honesty policy regarding cheating, plagiarism, misbehaviour: all violations to the code of conduct of the University of Jordan is unacceptable and will be punished with an F for the full course.

E- **Grading policy**: grading is treated as follows: F- Available university services that support achievement in the course:

1. Written Reports:
- organization, clarity and continuity.
- quality, completeness and soundness of the analysis
2. Assignments:
- On-time submission
- Authenticity

F- **Available university services that support achievement in the course**: computer labs, personal computers, internet connection, Anaconda with python 3.7, Microsoft products (Office 2016, Office 365, Windows 10)

25. References:

A- Required book(s), assigned reading and audio-visuals:

1. Luger G., Artificial Intelligence, The Benjajmin/Cummings Publishing Company, 6th Edition, 2008.
2. Artificial Intelligence: A Modern Approach (Pearson Series in Artifical Intelligence)
3. Russell, S. J., & Norvig, P. (2020). Artificial intelligence: a modern approach. Englewood Cliffs, N.J., Prentice Hall.
4. SWI-Prolog

B- Recommended books, materials, and media:

1. Rich E. and Kevin K., Artificial Intelligence, McGraw Hill, 1991.
2. Cawsey A., The Essence of Artificial Intelligence, Prentice Hall, 1997.
3. Jones M

C- Educational Platforms:

1. Elearning.ju.edu.jo
2. lmsystem.ju.edu.jo
3. http://teams.office.com/

26. Additional information:

Students are encouraged to make heavy use of the library, E-LIBRARY http://ezlibrary.ju.edu.jo/login or from within the university using (http://e-library)
- The instructor can make changes to this syllabus when necessary.
- University regulations will be preserved at all times

Name of Course Coordinator: ----------------------------------Signature: --------------------- Date: --------------------	
Head of Curriculum Committee/Department: --------------------------- Signature: -----------------------------------	
Head of Department: --- Signature: ---------------------------	
Head of Curriculum Committee/Faculty: -------------------------------------- Signature: -------------------------	
Dean: --- Signature: --	