1	Course title	Artificial Intelligence
2	Course number	1905320
3	Credit hours	٣
	Contact hours (theory, practical)	٣
4	Prerequisites/co-requisites	
5	Program title	Artificial Intelligence
6	Program code	5
7	Awarding institution	The university of Jordan
8	School	King Abdullah II School for Information Technology
9	Department	Artificial Intelligence
10	Level of course	Undergraduate
11	Year of study and semester (s)	2022-2023 (Fall)
12	Final Qualification	Bachelor of Science in Artificial Intelligence
13	Other department (s) involved in teaching the course	None
14	Language of Instruction	English
15	Teaching methodology	☐ Blended ☒ Online
16	Electronic platform(s)	☒ **Moodle** ☒ **Microsoft** Teams ☐ Skype ☐ Zoom ☐Others:…………
17	Date of production/revision	7 October 2022

18 Course Coordinator:

Name: Nadim Obeid
Office number: KASIT 2nd Floor 207
Phone number: 5355000/ext.: 22617
E-mail: obein@ju.edu.jo

19 Other instructors:

٢٠ Course Description:

As stated in the approved study plan.
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)

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٢١ Course aims and outcomes:

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)

Intended Learning Outcomes (ILOs):
Upon successful completion of this course students will be able to:

A- Knowledge and Understanding (students should)
  (A1) have some understanding of propositional calculus, first order predicate logic and other Knowledge representation techniques
  (A2) have some understanding of Prolog
  (A3) have some understanding of the basic architecture of expert systems.
  (A4) have some understanding of some blind and heuristic search techniques.

B- Intellectual skills-with ability to
  (B1) Appreciate the subtleties related to different approaches to AI
  (B2) Appreciate the subtleties related to different AI techniques.
  (B3) Decide the suitability of AI techniques for a problem/domain.
  (B4) Analyze and design a solution to a problem where AI techniques can be employed.

C- Practical Skills-With ability to
  (C1) Implement a solution to a simple problem where AI techniques can be employed.
  (C2) Write simple AI programs in PROLOG.
  (C3) Express knowledge of a domain in a suitable knowledge representation formalism.

D- Transferable Skills-With ability to
  (D1) Deploy communication skills.
  (D2) Work effectively within a group to analyze, design and implement a KBS.
  (D3) To work to tight deadlines
  (D4) effectively present the final work in a demo.

ABET Students Outcomes (SOs):

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

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.

3- Communicate effectively in a variety of professional contexts.

Mapping ILOs to ABET SOs

ILOs	ABET SOs
A1, A2, A3, A4,B1, B2, B3, B4,	1
C1, C2, C3	2
D1, D2, D3, D4	3

٢٢ Topic Outline and Schedule:

Topic	Week	ILOs	ABET SOs	Instructor	TLA (teaching, learning and Assessment)
- Welcome and Orientation - Introduction to artificial intelligence (concepts, research areas and applications)	1 → 2	B1, B2, B3	1	Nadim Obeid + Dr Mousa Al-Akhras	Synchronous lecture (MS-Teams) Luger's book + Available Notes Homeworks, Discussion, Exams
- Propositional calculus and first order predicate logic. - Translation between logic and natural language texts	2 →3.5	A1, C1, C3	1,2	Nadim Obeid + Dr Mousa Al-Akhras	Synchronous lecture (MS-Teams) Luger's book + Available Notes Homeworks, Discussion, Exams
Programming in Prolog	3.5→ 6	A2, C1, C2, C3	1,2	Nadim Obeid + Dr Mousa Al-Akhras	As above
Blind and heuristic search techniques	6 → 7.5	A4, B1, B2, B3, B4	1	Nadim Obeid	As above
Production Systems + Example	7.5 →9	A1, B1, B2, C3	1		As above
architecture of Expert systems	9	B1, B2, B3, B4	1		As above
Rule-based vs Model based reasoning	10	B1, B2, B3, B4	1		As above
Introduction to machine learning and data mining	10				
Naive Bayesian	11 → 12.5				
Decision trees	12.5 →13.5				
K−means clustering + nearest neighbor classification	13.5 → 15				
Revision + Discussions	16				
	14				

(Please mention instructors per topic if the course topics are being taught by more than one instructor)

٢٣ Evaluation Methods:

Opportunities to demonstrate achievement of the ILOs are provided through the following assessment methods and requirements:
- Assignments
- Project
- Mid exam
- Final Exam

٢٤ Course Requirements:

- Mobile, Laptop or desktop computers
- Internet connection
- Prolog System
- Account on Microsoft Teams + Moodle.
- Webcam (when needed)

۲۰ Course Policies:

A- Attendance policies

Attending online meetings is mandatory. Attendance will be taken for each meeting. Regular attendance is essential for satisfactory completion of this course and university regulations will be applied.

B- Absences from exams and handing in assignments on time

- Any student who misses any exam will receive a zero grade. Permission for makeup will be granted only if the student notifies the instructor in due time and presents evidence of an officially excused absence.
- Submitting the assignments will be through the Moodle platform, the time duration for each home assignment will be determined clearly. Late submissions are not allowed; any student exceed this time duration without submitted his/her assignment will take the zero as mark.

C- Health and safety procedures

All students should comply with the university Health and Safety procedures (i.e., COVID-19 procedures).

D- Honesty policy regarding cheating, plagiarism, misbehavior

Assignments are individual or done in learning teams. While students are free to discuss their individual assignments with anybody, including fellow students, individual assignments are expected to show the expertise, creativity and critical faculty of the individual student. Virtually identical individual assignments (in the judgment of the instructor) are not acceptable. Plagiarism is unacceptable and will be punished with an F for the full course. References to all source materials are necessary. For more details on University regulations please visit http://www.ju.edu.jo/rules/index.htm

E- Grading policy + Weighting (i.e. weight assigned to exams as well as other student work)

All of the following are important in the evaluation of a student's work.

- Written Reports:
    - Organization, clarity and continuity.
    - Quality, completeness and soundness of the analysis
    - Quality of presentation.
- Oral Presentation:
    - Organization and continuity.
    - Selection and support of recommendations.
    - Time, style and clarity.
    - Professionalism.
- Assessment Weights:
    - Assignments + project + participations: 20%
    - Mid exam: 30%
    - Final exam: 50%
- Satisfactory completion of this subject requires a 50% pass in the end-of-semester
- Suggested Grading Scale:

0-44	F	45-49	D-	50-54	D	55-59	D+	60-63	C-	64-68	C
69-72	C+	73-76	B-	77-80	B	81-84	B+	85-89	A-	90-100	A

F- Available university services that support achievement in the course:

elearning.ju.edu.jo

lmsystem.ju.edu.jo

QF-AQAC-03.02.1.3

G- Statement on Students with disabilities

Students with Disabilities: Students with disabilities who need special accommodations for this class (online meetings) are encouraged to contact the instructor and/or their academic advisor as soon as possible. In order to receive accommodations for academic work in this course, students must inform the course instructor and/or their academic advisor, preferably in a written format, about their needs no later than the 2nd week of classes.

٢٦ References:

A- Required book (s), assigned reading and audio-visuals:
1. Luger G., Artificial Intelligence, The Benjajmin/Cummings Publishing Company, 6th Edition, 2008.
2. 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. T., AI Application Programming, 2nd edition, Charles River Media, 2005

C- Educational Platforms:
1. Elearning.ju.edu.jo
2. lmsystem.ju.edu.jo
3. http://teams.office.com/

٢٧ Additional information:

1. Supplementary notes are made available of the e-learning (Moodel) system.
2. Students are encouraged to make use of JU library, E-LIBRARY:

Some important/relevant journals include:
(1) Artificial Intelligence
(2) Applied Intelligence
(3) AI Review

Name of Course Coordinator: Nadim Obeid ----------------Signature: ----------------------

Date: 16/10/2020

Head of Curriculum Committee/Department: ----------------------Signature: ----------------------

Head of Department: --Signature: ----------------------

Head of Curriculum Committee/Faculty: -----------------------------Signature: -----------------------

Dean: ---Signature: ----------------------