| 1 | **Course title** | Introduction to Artificial Intelligence |
|---|---|---|
| 2 | **Course number** | 1905120 |
| 3 | **Credit hours** | ٣ |
| | **Contact hours (theory, practical)** | ٣ |
| 4 | **Prerequisites/corequisites** | |
| 5 | **Program title** | Artificial Intelligence |
| 6 | **Program code** | ٢ |
| 7 | **Awarding institution** | The university of Jordan |
| 8 | **School** | King Abdullah II School for Information Technology |
| 9 | **Department** | Computer Information Systems |
| 10 | **Level of course** | Undergraduate |
| 11 | **Year of study and semester (s)** | 2021-2022 (Fall) |
| 12 | **Final Qualification** | Bachelor of Science inartificial 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** | 16 October, 2021 |

## 18 Course Coordinator:

**Name:** Nadim Obeid
**Office number:** KASIT 2ⁿᵈ Floor 207
**Phone number:** 5355000/ext.: 22627
**E-mail:** obein@ju.edu.jo

## 19 Other instructors:

## ٢٠ Course Description:

*As stated in the approved study plan.*
Introduction to many primary concepts in artificial intelligence such as reasoning, learning, planning, perception and uncertainty management. Subjects covered in the this course include: Knowledge Representation (logic, Prolog), Planning and Reasoning (Logical agents), Expert Systems (production systems), Search (blind-, heuristic-, evolutionary-search methods),Machine Learning

and Data Mining (K-means clustering, nearest neighbor classification, Naive Bayesian, Decision trees)

## ٢١ Course aims and outcomes:

**Aims:**

The aim of the course is to bring to the awareness of students the different research areas and aspects of artificial intelligence. students will be shown (1) how to express knowledge of a simple domain in first order predicate calculus and to solve problems using explicit knowledge and reasoning, and how to develop an expert system. Students will (1) be familiarized with the notion of search and (2) shown how to use some appropriate search techniques (blind or heuristic) for some problems. The students will also be given some grounding in the principal techniques of data mining and be introduced to some applications of data mining. Students will be introduced to some learning techniques to help obtain a clear picture of the concepts of machine learning.

**ended 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 first order predicate logic, and planning
- (A2) have some understanding of production systems, rule-based systems and the basic architecture of expert systems.
- (A3) have some understanding of some blind and heuristic search techniques.
- (A4) have some understanding of the principal techniques of data mining.

**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) showing ability to determine how a simple problem may be solved using AI techniques.
- (C2) showing ability to apply some data mining techniques.
- (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 and design an AI system.
- (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<br>- Introduction to artificial intelligence (concepts, research areas and applications) | 1 and 2 | B1, B2, B3 | 1 | Nadim Obeid | Synchronous lecture (MS-Teams)<br>Luger's book + Available Notes Homeworks, Discussion, Exams |
| – Knowledge representation, first order predicate logic, Planning. | 3-6 | A1, C1, C3 | 1,2 | Nadim Obeid | Synchronous lecture (MS-Teams)<br>Luger's book + Available Notes Homeworks, Discussion, Exams |
| Programming in Prolog | 7-9 | A2, C1, C2, C3 | 1,2 | Nadim Obeid | As above |
| Blind and heuristic search techniques | 10-12 | A4, B1, B2, B3, B4 | 1 | Nadim Obeid | As above |
| Production Systems | 13 | A1, B1, B2, C3 | 1 | Nadim Obeid | As above |
| architecture of Expert systems | 14 | B1, B2, B3, B4 | 1 | Nadim Obeid | As above |
| Rule-based vs Model based reasoning | 15 | B1, B2, B3, B4 | 1 | Nadim Obeid | As above |
| Revision + Discussions | 16 | | 3 | Nadim Obeid | As above |
| | | | | | |
| | | | | | |

(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)

**٢٥ Course Policies:**

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## 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

## 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: ----------------------