The University of Jordan

Accreditation & Quality Assurance Center

COURSE Syllabus

1	Course title	**Artificial Intelligence & Expert Systems**
2	Course number	**1902733**
3	**Credit hours (theory, practical)**	**3**
	Contact hours (theory, practical)	**3**
4	Prerequisites/corequisites	
5	Program title	**Information Systems**
6	Program code	
7	Awarding institution	**The University of Jordan**
8	Faculty	**King Abdullah II School for Information Technology**
9	Department	**Computer Information Systems**
10	Level of course	**MSc**
11	Year of study and semester (s)	**2014-2015, Second semester**
12	Final Qualification	**MSc**
13	Other department (s) involved in teaching the course	
14	Language of Instruction	**English**
15	Date of production/revision	
16	Required/ Elective	**Required**

16. Course Coordinator:

Office number: 207
office hours: 2-3:30 Mon.
phone number: 22617
email addresses: obein@ju.edu.jo

17. Other instructors:

Office numbers, office hours, phone numbers, and email addresses should be listed.

18. Course Description:

Propositional logic, First order logic, Representing simple domains in First order logic, Resolution refutation proofs; Natural deduction Proofs, Logic programming (Prolog), Negation as failure, Exhaustive search methods; Heuristic search methods; Production systems; Architecture of expert systems. Knowledge acquisition, planning and scheduling; Rule-Based, Case-based reasoning, Model-based reasoning

1.
2. **19. Course aims and outcomes:**

3.

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 domain in propositional and/or first order predicate calculus, (2) design plans, (3) design solutions to problems where AI techniques can be employed and (4) write programs in Prolog that reason (using the available knowledge) and act to achieve their goals. Furthermore, students will have the ability to decide and use some appropriate search techniques (blind or heuristic) for some problems.

B- Intended Learning Outcomes (ILOs): Upon successful completion of this course students will ...

OA-Knowledge and Understanding (students should)
   (OA1) have deep understanding of propositional calculus, first order predicate logic and various issues in Knowledge Representation and Nonmonotonic Logic.
   (OA2) have deep understanding of Prolog and Negation as failure
   (OA3) have understanding of the architecture of expert systems.
   (OA4) have some understanding of some blind and heuristic search techniques.

OB-Intellectual skills-with ability to
   (OB1) Appreciate the subtleties related to different approaches to AI
   (OB2) Appreciate the subtleties related to different AI techniques.
   (OB3) Decide the suitability of AI techniques for a problem/domain.
   (OB4) Analyze and design a plan and/or solution to a problem where AI techniques can be employed.

OC- Practical Skills-With ability to
   (OC1) Implement a solution to a problem where AI techniques can be employed.
   (OC2) Write research papers and advanced AI programs in PROLOG.
   (OC3) Express knowledge of a domain in a suitable knowledge representation formalism.

OD-Transferable Skills-With ability to
   (OD1) Deploy communication skills.
   (OD2) Work effectively on a research idea.
   (OD3) To work to tight deadlines
   (OD4) effectively present the final work in a demo.

20. Topic Outline and Schedule:

Topic	Week	Instructor	Achieved ILOs	Evaluation Methods	Reference
- Welcome and Orientation **Concepts, research areas and applications**	**1 and 2**	**Nadim Obeid**	**OB1, OB2, OB3**	**Homeworks, Discussion, Exams**	**Recomended research papers and + Available Notes**
propositional calculus and first order predicate logic. Natural deduction proofs, Refutation-resolution proofs, Representating knowledge of a chosen domain	**3-6**	**Nadim Obeid**	**OA1, OC1, OC3**	**Homeworks, Discussions, Exams**	**Recomended research papers and + Available Notes**
Programming in Prolog, Negation as Faliure, Nonmonotonic logic, suitability of FOPC for knowledge representatio n	**7-9**	**Nadim Obeid**	**OA2, OC1, OC2, OC3**	**Homeworks, Labs, Exams**	**Recomended research papers and + Available Notes**
Blind and heuristic search techniques	**10-11**	**Nadim Obeid**	**OA4, OB1, OB2, OB3, OB4**	**Homeworks, Discussions, Exams**	**Recomended research papers and + Available Notes**
Production Systems	**12**	**Nadim Obeid**	**OA1, OB1, OB2, OC3**	**Homeworks, Discussions, Exams**	**Recomended research papers and + Available Notes**

architecture of Expert systems	13	Nadim Obeid	OB1, OB2, OB3, OB4	Homeworks, Discussions, Exams	Recomended research papers and + Available Notes	
Planning, Scheduling, Rule-based vs Model based reasoning	14-15	Nadim Obeid	OB1, OB2, OB3, OB4	Homeworks, Discussions, Exams	Recomended research papers and + Available Notes	

21. Teaching Methods and Assignments:

Development of ILOs is promoted through the following <u>teaching and learning methods</u>:

Lectures, Homeworks, Discussions, working in groups, research projects

22. Evaluation Methods and Course Requirements:

Opportunities to demonstrate achievement of the ILOs are provided through the following <u>assessment methods and requirements</u>:

Homeworks, discussions, presentations, quiz, exams

23. Course Policies:

A- Attendance policies:

University Regulations

B- Absences from exams and handing in assignments on time:

University Regulations

C- Health and safety procedures:

University Regulations

D- Honesty policy regarding cheating, plagiarism, misbehavior:

University Regulations

E- Grading policy:

Mid term exam 30%

Research paper: 30%

Final exam: 40%

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

Computer laboratories, data shows and whiteboards

24. Required equipment:

Computer laboratory, data show and white board

25. References:

A- Required book (s), assigned reading and audio-visuals:
  1. Luger G., Artificial Intelligence, The Benjajmin/Cummings Publishing Company, 5th Edition, 2004.

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

26. 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:
access within the university: http://e-library
access from outside: http://ezlibrary.ju.edu.jo/login
.
Some important/relevant journals include:
(1) Artificial Intelligence
(2) Applied Intelligence

(3) AI Review

Name of Course Coordinator: Nadim Obeid

Signature: ------------------------ Date: ------------------------

Head of curriculum committee/Department: ------------------------ Signature: --------------------------------

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

Head of curriculum committee/Faculty: ------------------------ Signature: --------------------------------

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

<u>Copy to:</u>
Head of Department
Assistant Dean for Quality Assurance
Course File