



ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

**Course Specifications
(CE)**

14034302-3 Introduction to Artificial Intelligence

Course Specifications

Institution Umm Al-Qura University	Date of Report 17/04/2016
College/Department College of Computer & Information Systems	

A. Course Identification and General Information

1. Course title and code: 14034302-3 Introduction to Artificial Intelligence			
2. Credit hours 3			
3. Program(s) in which the course is offered. (If general elective available in many programs indicate this rather than list programs) Computer Engineering			
4. Name of faculty member responsible for the course Dr. Anas Basalamah			
5. Level/year at which this course is offered Level 9 or 10			
6. Pre-requisites for this course (if any) Object Oriented Programming, Probability and Statistics for Engineers			
7. Co-requisites for this course (if any)			
8. Location if not on main campus Al-Abidiyah Umm Al Qura University - Makkah Al Mukarramah			
9. Mode of Instruction (mark all that apply)			
a. Traditional classroom	<input checked="" type="checkbox"/> Yes	What percentage?	<input type="text" value="100"/>
b. Blended (traditional and online)	<input type="checkbox"/>	What percentage?	<input type="text"/>
c. E-learning	<input type="checkbox"/>	What percentage?	<input type="text"/>
d. Correspondence	<input type="checkbox"/>	What percentage?	<input type="text"/>
f. Other	<input type="checkbox"/>	What percentage?	<input type="text"/>
Comments:			

B Objectives

1. What is the main purpose for this course?
1. The student will understand the notion of a knowledge-based system.
2. The student will understand how search can be used in problem solving.
3. The student will understand (and be able to contrast) the notions of deductive, inductive, and probabilistic reasoning.
The student will have experience developing computer programs that use symbolic reasoning to solve problems, culminating in a significant project.
2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)
1. Use of web based resources.
2. Use of e-learning system.
3. Use of PowerPoint slides.

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered		
List of Topics	No. of Weeks	Contact Hours
Introduction to AI	1	3
Problem Solving	1	3
Probability in AI	1	3
Probabilistic Inference	1	3
Machine Learning	1	3
Unsupervised Learning	1	3
Representation with Logic	1	3
Planning	1	3
Planning under Uncertainty	1	3
Reinforcement Learning	1	3
Hidden Markov Models and Filters	1	3
Markov Decision Process Review	1	3
Games	1	3
Game Theory	1	3



2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	40				2	42
Credit	3					3

3. Additional private study/learning hours expected for students per week.	40
--	----

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy
--

Course Learning Outcomes, Assessment Methods, and Teaching Strategy work together and are aligned. They are joined together as one, coherent, unity that collectively articulate a consistent agreement between student learning, assessment, and teaching.

The *National Qualification Framework* provides five learning domains. Course learning outcomes are required. Normally a course has should not exceed eight learning outcomes which align with one or more of the five learning domains. Some courses have one or more program learning outcomes integrated into the course learning outcomes to demonstrate program learning outcome alignment. The program learning outcome matrix map identifies which program learning outcomes are incorporated into specific courses.

On the table below are the five NQF Learning Domains, numbered in the left column.

First, insert the suitable and measurable course learning outcomes required in the appropriate learning domains (see suggestions below the table). **Second**, insert supporting teaching strategies that fit and align with the assessment methods and intended learning outcomes. **Third**, insert appropriate assessment methods that accurately measure and evaluate the learning outcome. Each course learning outcomes, assessment method, and teaching strategy ought to reasonably fit and flow together as an integrated learning and teaching process. **Fourth**, if any program learning outcomes are included in the course learning outcomes, place the @ symbol next to it.

Every course is not required to include learning outcomes from each domain.



	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	Knowledge		
1.1	Ability to appreciate when and where AI should be used.	1. Lectures, tutorials and independent study assignments. 2. Introductory lecture gives an overview of the content and significance of the course and of its relationship to students' existing knowledge. 3. Each subsequent lecture begins with a similar overview linking the particular content of the presentation to the general overview. 4. Tutorials review the content of each lecture and clarify any matters not understood. 5. Individual assignments require use of library reference material and web sites to identify information required to complete tasks.	1. Multiple choice knowledge item on all exams. One midterm and one final will be conducted.
1.2	Have a knowledge of different AI techniques used to solve problems.		
2.0	Cognitive Skills		
2.1	Understanding of AI techniques.	1. Explanations and examples given in lectures and practiced under supervision in tutorials. 2. Transfer of learning encouraged by use of analytical tools in different applications and through discussion of potential application in other areas. Assignment tasks include some open ended tasks designed to apply predictive, analytical and problem	1. Problem solving questions on tests given at the end of each topic and on end of semester examination. 2. Group and individual assignments require application of analytical tools in problem solving tasks.



		solving skills.	
3.0	Interpersonal Skills & Responsibility		
3.1	Improvement of capacity for self-directed learning.	1. One group project in which 25% of assessment is based on individual's contribution to the group task. (Instructor meets with each group part way through project to discuss and advise on approach to the task) 2. Two individual assignments requiring investigation using internet and library resources as a means of developing self-study skills. 3. Role play exercise on controversial issue relevant to the course based on a case study, with discussion in tutorial of appropriate responses and consequences to individuals involved.	1. Assessment of group assignment includes component for individual contribution. 2. Capacity for independent study assessed in individual assignments.
3.2	Improvement of personal and social responsibility.		
3.3			
3.4			
4.0	Communication, Information Technology, Numerical		
4.1	AI algorithms and techniques.	Student assignments require good standards of use of ICT. Where standards are inadequate the student is referred for special remedial instruction.	1. Test questions require interpretation of simple statistical information. 2. Assessments of students assignment and project work include expectation of adequate use of numerical and communication skills.
4.2			
4.3			
4.4			
5.0	Psychomotor		
5.1			
5.2			

Suggested Guidelines for Learning Outcome Verb, Assessment, and Teaching

NQF Learning Domains	Suggested Verbs
Knowledge	list, name, record, define, label, outline, state, describe, recall, memorize, reproduce, recognize, record, tell, write
Cognitive Skills	estimate, explain, summarize, write, compare, contrast, diagram, subdivide, differentiate, criticize, calculate, analyze, compose, develop, create, prepare, reconstruct, reorganize, summarize, explain, predict, justify, rate, evaluate, plan, design, measure, judge, justify, interpret, appraise



Interpersonal Skills & Responsibility	demonstrate, judge, choose, illustrate, modify, show, use, appraise, evaluate, justify, analyze, question, and write
Communication, Information Technology, Numerical	demonstrate, calculate, illustrate, interpret, research, question, operate, appraise, evaluate, assess, and criticize
Psychomotor	demonstrate, show, illustrate, perform, dramatize, employ, manipulate, operate, prepare, produce, draw, diagram, examine, construct, assemble, experiment, and reconstruct



Suggested **verbs not to use** when writing measurable and assessable learning outcomes are as follows:

Consider	Maximize	Continue	Review	Ensure	Enlarge	Understand
Maintain	Reflect	Examine	Strengthen	Explore	Encourage	Deepen

Some of these verbs can be used if tied to specific actions or quantification.

Suggested assessment methods and teaching strategies are:

According to research and best practices, multiple and continuous assessment methods are required to verify student learning. Current trends incorporate a wide range of rubric assessment tools; including web-based student performance systems that apply rubrics, benchmarks, KPIs, and analysis. Rubrics are especially helpful for qualitative evaluation. Differentiated assessment strategies include: exams, portfolios, long and short essays, log books, analytical reports, individual and group presentations, posters, journals, case studies, lab manuals, video analysis, group reports, lab reports, debates, speeches, learning logs, peer evaluations, self-evaluations, videos, graphs, dramatic performances, tables, demonstrations, graphic organizers, discussion forums, interviews, learning contracts, antidotal notes, artwork, KWL charts, and concept mapping.

Differentiated teaching strategies should be selected to align with the curriculum taught, the needs of students, and the intended learning outcomes. Teaching methods include: lecture, debate, small group work, whole group and small group discussion, research activities, lab demonstrations, projects, debates, role playing, case studies, guest speakers, memorization, humor, individual presentation, brainstorming, and a wide variety of hands-on student learning activities.

5. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Homework	4	20
2	Midterm	9	20
3	Homework (individual) or project (combined)	12	20
4	Final	17	40
5			
6			
7			
8			

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

Faculty is available 3 hours per week for student help and consulting.

E. Learning Resources

1. List Required Textbooks

- Artificial Intelligence: A Modern Approach 3rd Edition, Russell & Norvig, 2009, Prentice Hall, ISBN 0136042597

2. List Essential References Materials (Journals, Reports, etc.)

- Artificial Intelligence, Elaine Rich, Microelectronics and Computer Research Center and Kevin Knight, Carnegie-Mellon University, 1991.

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

<http://aima.cs.berkeley.edu/ai.html>

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

<http://www.swi-prolog.org/>

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)

- A 25 student lecture room having Multimedia projector for lectures and students presentation.

2. Computing resources (AV, data show, Smart Board, software, etc.)
<ul style="list-style-type: none"> Computers are required for instructor
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)
N/A

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching
<ul style="list-style-type: none"> Confidential completion of standard course evaluation questionnaire. Focus group discussion with small groups of students.
2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor
<ul style="list-style-type: none"> Observations and assistance from colleagues Independent assessment of standards achieved by students Independent advice on assignment tasks,
3 Processes for Improvement of Teaching
<ul style="list-style-type: none"> Check marking of a sample of examination papers or assignment tasks.
4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)
<ul style="list-style-type: none"> Check marking by an independent member teaching staff of a sample of student work. Periodic exchange and remarking of tests or a sample of assignments with staff at another institution.



5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- End of semester review.

Faculty or Teaching Staff: _____

Signature: _____ Date Report Completed: _____

Received by: _____ Dean/Department Head

Signature: _____ Date: _____