اعتماد
NCAAA

T4

2020

Course Specifications

Course Title:	Artificial Intelligence
Course Code:	423CCS-3
Program:	BSc in in Computer Science
Department:	Computer Science
College:	Computer Science and Information Systems
Institution:	Najran University

Table of Contents

A. Course Identification

1. Credit hours:
2. Course type   **a.**   University ☐   College ☐   Department ☑   Others ☐   **b.**   Required ☑   Elective ☐
3. Level/year at which this course is ffered: Year 4/ Level 10
4. Pre-requisites for this course (if any)**:** None
5. Co-requisites for this course (if any)**:** None

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	60	100%
2	Blended		
3	E-learning		
4	Distance learning		
5	Other		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	Lecture	30
2	Laboratory/Studio	20
3	Tutorial	10
4	Others (specify)	0
	Total	60

B. Course Objectives and Learning Outcomes

1. Course Description   This course will provide an introduction on the basic concepts and techniques of Artificial Intelligence. It gives an overview of underlying ideas such as search, knowledge representation and reasoning, expert systems, learning, natural language processing, robotics and uncertainty. To gain the experience of doing independent study and research.
2. Course Main Objective

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	

	CLOs	Aligned PLOs
1.1	Explain the difference in 'intelligence' and Artificial Intelligence', and the land mark achievements in the development of AI evolution.	K1,
1.2	Describe Artificial Intelligence techniques in solving problems (i.e. expert systems, natural language processing, robotics, reasoning with uncertainty, game playing, prolog and computer vision)	K1, K2
1.3		
1...		
2	**Skills :**	
2.1	Apply different search techniques (i.e. Depth First Search, Breath first search, Iterative deepening search, Uniform Cost search, heuristic function, greedy search, A* search and iterative deepening A* search) to solve problems.	S1, S3 S4, S5
2.2	Use the knowledge representation techniques to represent the knowledge in different domain.	S2, S4, S5
2.3		
2...		
3	**Values:**	
3.1	Implement the learning of this course in terms of a course project based on AI techniques.	C1, C2
3.2		
3.3		
3...		

C. Course Content

No	List of Topics	Contact Hours
1	**Introduction to Artificial Intelligence:** (Definitions, Goals, approaches, Applications and History), Intelligent Agents; the Turing test, specify PEAS.	6
2	**Searching Techniques:** Uninformed search algorithms (breadth first and depth first with related strategies; branch-and-bound and optimal path; memory-bounded search strategies), Heuristic search (Greedy search, A*-search, and hill climbing).	8
3	**Knowledge Representation:** Predicate and propositional logic, resolution and deductive proof techniques (e. g. generalized modus ponens) Reasoning with uncertainty.	6
4	**Planning:** Planning operators/languages, planning algorithms including (partial-order planning, re-planning, and conditional planning).	6
5	**Reasoning with uncertainty, decision:** Introduction to probability, Bayes Rule, Belief Networks and inference with them; basic concepts of decision theory and decision making (decision tree and decision network).	6
6	**Learning:** General concepts of learning with introduction to PAC theory. Decision trees and decision lists, hypothesis space learning, and perceptions.	10
7	**Agent interaction:** Basic concepts of agent communication and coordination, including adversarial search and game theory.	6

8	**Constraint Satisfaction Problems:** Game playing, machine learning, natural language processing, expert Systems, vision and Robotics.	6
9	**Introduction to Prolog:** Presentation of prolog (the program and query) and the facts (simple facts, facts with arguments and how to query).	6
	Total	60

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		
1.1	Explain the difference in 'intelligence' and Artificial Intelligence', and the land mark achievements in the development of AI evolution.	TS-1: Relate Course	Quiz, Assignment, Midterm Exam
1.2	Describe Artificial Intelligence techniques in solving problems (i.e. expert systems, natural language processing, robotics, reasoning with uncertainty, game playing, prolog and computer vision)	TS-1: Relate Course Learning Outcomes (CLOs) to the topics TS-2: Giving Lectures in PPT, recalling the lecture through asking Questions. Clarifying doubts on Lecture. TS-3: Conducting a discussion of real life problems, among teacher, students TS-4: Cooperative learning among the students. Encourage students to browse different journals, seminars or websites at their leisure time to have a better understanding about the course	Midterm Exam, assignment 1, 2, Final Theory exam
…			
2.0	**Skills**		
2.1	Apply different search techniques (i.e. Depth First Search, Breath first search, Iterative deepening search, Uniform Cost search, heuristic function, greedy search, A* search and iterative deepening A* search) to solve problems.		Quiz2, and Final Theory Exam
2.2	Use the knowledge representation techniques to represent the knowledge in different domain.	TS-1: Relate Course Learning Outcomes (CLOs) to the topics	Final Theory exam

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
		TS-2: Giving Lectures in PPT, recalling the lecture through asking Questions. Clarifying doubts on Lecture. TS-3: Conducting a discussion of real life problems, among teacher, students TS-4: Cooperative learning among the students. Encourage students to browse different journals, seminars or websites at their leisure time to have a better understanding about the course	
…			
3.0	**Values**		
3.1	Implement the learning of this course in terms of a course project based on AI techniques.	TS-2: Giving Lectures in PPT, recalling the lecture through asking Questions. Clarifying doubts on Lecture.	Implement the learning of this course in terms of a course project based on AI techniques.
3.2			
…			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quiz-1	5rd week	5
2	Quiz-2	9th week	5
3	Assignment 1	4th week	10
4	Assignment 2 or mini project (presentation)	10th week	10
5	Midterm Exam	6th week	20
6	Final Theory Exam	12th or 13th week	50

*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice:
Specifying office hours, forming discussion groups using social media (e.g. Facebook and Twitter) and messenger application (e.g. WhatsApp and Telegram)

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	• Stuart Russell, Peter Norvig. *Artificial Intelligence: A Modern Approach*, 4th Edition, Prentice Hall: 2020, ISBN: 13: 978-0134610993 (US Edition)
Essential References Materials	• George F. Luger. Artificial Intelligence – Structures and Strategies for Complex problem solving, 6th Edition, Pearson International Edition, , 2009. • Ivan Bratko, Prolog Programming for Artificial Intelligence, 3rd Edition, Addison Wesley, 2012. ISBN- 13: 978-0321417466 • Wolfgang Erfel. Introduction to Artificial Intelligence, 3rd edition, Springer: New York, 2019. ISBN 978-0-85729-298-8
Electronic Materials	
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classrooms to accommodate 65 students per classroom with desks and chairs, labs to accommodate 25 students per lab with advanced computers.
Technology Resources (AV, data show, Smart Board, software, etc.)	
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	ACs for labs and classrooms, black curtains

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Strategies for Obtaining Student Feedback on Effectiveness of Teaching	Students, instructor and peer review	• Online course survey: By the end of each semester, students give their opinions about many factors in the course. They give feedback about the teaching strategies, assessment methods, textbooks, instructor, etc. • Feedback about Course Learning Outcomes (CLOs): A course survey is

Evaluation Areas/Issues	Evaluators	Evaluation Methods
		distributed to students to take their opinions about the CLOs.
Other Strategies for Evaluation of Teaching by the Program/Department Instructor	Instructor, faculty and student	• Discussion with other faculty members about students understanding and best way of teaching them. • Peer consultation on teaching • Discussions within the group of faculty teaching the same course before
Processes for Improvement of Teaching	Instructor and Faculty	• Describe the relationships between the course's topics and CLOs. • Course syllabus must be distributed in the first week. It should contain the necessary information about the course (CLOs, assessment methods, descriptions, etc.) • Feedback of the students about the understanding of lectures in academic advising hours. • Analysis the critical topics with real life examples and preparation of good effective PPT slides. • By suggesting good teaching methodologies • Ensure that all students participate in the class. • Encourage students to attend in office hours to clarify the doubts.
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)	Peer and instructor	• The course coordinator has to approve the exams and grades of students in exams. • The curriculum committee will review all courses by the end of each semester and approve actions and

Evaluation Areas/Issues	Evaluators	Evaluation Methods
		improvements plan to be carried out. • Getting feedback from the students who will pass the course and work in the practical field • The vice dean and the dean of the college have to approve the final grades.
the planning arrangements for periodically reviewing course effectiveness and planning for improvement	Instructor	• Each semester, the instructor has to teach the course according the previous course materials (Course specification, report, improvement plan, etc.). • By the end of each semester, the instructor has to prepare a course file which contains all activities and practices taken in the course. Achievements of CLOs can be used if the students' levels improved or not

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	Computer Science Departmental Council
Reference No.	14440203-0185-00002
Date	1st Sep, 2022