هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

2023
TP-153

Course Specification
(Bachelor)

Course Title:	Artificial Intelligence
Course Code:	CSC 1401
Program:	Bachelor in Computer
Department:	Computer Science
College:	Computers and Information Technology
Institution:	University of Tabuk
Version:	1.0
Last Revision Date:	27 July 2022

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: (4)					
2. Course type					
A.	☐University	☐College	☒ Department	☐Track	☐Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: Level 7/Year 4					
4. Course general Description:					
Is a course that explain how to realize the intelligent human behaviors on a computer. The aim of AI course is to describe how a computer can learn, plan, and solve problems autonomously. The main topics are: knowledge representation, search, reasoning, and intelligent agents.					
5. Pre-requirements for this course (if any)**:**					
Data Structures and Algorithm CSC1204					
6. Co-requisites for this course (if any)**:**					
NA					
7. Course Main Objective(s):					
• Formulate problem state space for a problem expressed in English. • Compare and construct the most common models used for knowledge representation and highlighting their strengths and weakness . • Select appropriate search algorithm for a problem and solve it using AI programming language. • Understand the basic method of reasoning. • Explain how agent differ from other category of intelligent systems. • Use a Constraint Satisfaction Problem to solve a propriate problem. • Ability to implement AI methods using AI language.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	75	100%
2	E-learning		
3	Hybrid • Traditional classroom • E-learning		

No	Mode of Instruction	Contact Hours	Percentage
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	45
2.	**Laboratory/Studio**	30
3.	**Field**	
4.	**Tutorial**	
5.	**Others (specify)**	
Total		75

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of PLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Choose appropriate strategy to analyze the problems	K2	Lectures Labs	Exams Lab Reports
1.2	Understand role of probability theory in the solution of computing problems	K1		
1.3	Understand the appropriate logic and computer syntax for solution development	K3		
1.4	Utilize appropriate models for solution development	K4		
2.0	**Skills**			
2.1	Apply calculus in the solution of computing problems	S1	Lectures Labs	Exams Lab Reports Project Assignments
2.2	Utilize computer mathematical toolboxes to solve and simulate heterogeneous problems	S1		
2.3	Use appropriate models for solution development	S2		

Code	Course Learning Outcomes	Code of PLOs aligned with program	Teaching Strategies	Assessment Methods
2.4	Design a successful intelligent solution to address required problem	S3		
3.0	**Values, autonomy, and responsibility**			
3.1	Utilize a modern software development environment and programming tools	V1	Labs	Project

C. Course Content

No	List of Topics	Contact Hours
1.	AI history, definitions, types, and applications Lab: Installation and Working with SWI Prolog environment	5
2.	Knowledge Representation (Part one): Commonsense Knowledge (CSK), Scientific Knowledge, Difficulties in representing CSK, Properties and types of KR techniques, KR Sschemes,Sematic Networks, Inheritance. Lab: Defining of facts and predicates	5
3.	Knowledge Representation (Part Two): Frames, Reification, Rules, Scripts, Graph. Lab: Defining of Rules, defining of complete knowledge-based system	5
4.	Knowledge Representation (Part Three): Predicate, First Order Logic , and Expert System. Lab: Implementation of Expert System	5
5.	Search Strategies (Part One): Problem solving Concepts, Problem representation, Problem description, Well-Defined problems, Search as goal satisfaction. Lab: More examples of expert system	5
6.	Search Strategies (Part Two):General search algorithm, depth first search, breadth first search, Treatment of repeated states, Iterative deepening search. Lab: Implementation of depth and breadth first searches	5
7.	Search Strategies (Part Three): Greedy Best-First Search, A* search, Hill climbing, Simulated annealing search, Beam search. Lab: Implementation of Greedy Best-First Search and A* search	5
8.	Intelligent Agent (Part One): Definition of Intelligent Agent, PEAS analysis, Environment Types. Lab: Findall, Setoff, Bagof, Built-in predicates	5

9.	Intelligent Agent (Part Two): Structure of an intelligent agent, Agent types Lab: Implementation of intelligent agent	5
10.	Constraint Satisfaction (part one): Definitions, examples, Constraint graphs. Lab: Implementation of list	5
11.	Constraint Satisfaction (part two): Real-world CSPs, Standard search formulation, Backtracking search. Lab: Higher-order programming	5
12.	Knowledge base reasoning (part one): What is the reasoning, Logic Reasoning, Formal Logic, Informal Logic. Lab: Implementation of backtracking	5
13.	Knowledge base reasoning (part two): Formal System, Monotonic Logic, Non-monotonic Logic, Belief revision. Lab: Implementation of Recursion and Loops	5
14.	Reasoning in Uncertain Situations (part one): Uncertainty in Reasoning, Methods of Reasoning, Reasoning and KR. Lab: Programming inputs and outputs, programming optimization	5
15.	Reasoning in Uncertain Situations (part two): Deduction Logic, Induction logic, Abduction logic, Sources of Uncertainty in Reasoning. Lab: implementation of files	5
Total		**75**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Lab work and reports	8-14	20%
2.	Mid Term 1	6-7	10%
3.	Mid Term 2	11-12	10%
4.	Project	15	10%
5.	Assignments	5, and 13	10%
6.	Final Exam	16	40%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	Artificial Intelligence: Structures and Strategies for Complex Problem Solving 6th Edition. by George Luge. Publisher : Pearson; 6th edition (February 26, 2008)

	Prolog Programming for Artificial Intelligence, Ivan Bratko, 2011, 4th Edition, Addison Wesley 2009ISBN-13 / EAN: 9780201403756
Supportive References	Artificial Intelligence: A Modern Approach, Global Edition. By Stuart Russell , and Peter Norvig. ISBN13 9781292401133. Publication date 20 May 2021
Electronic Materials	**NA**
Other Learning Materials	**NA**

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	1. Classroom (40 seats)
Technology equipment (projector, smart board, software)	**1.** White board, data show projector, computer and internet connection.
Other equipment (depending on the nature of the specialty)	**NA**

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of Teaching	Faculty, Program Leaders, and Advisory Board	Both Direct and Indirect
	Students	Indirect
Effectiveness of Students Assessment	Faculty, Program Leaders, Advisory Board, and Independent Opinion	Both Direct and Indirect
Quality of Learning Resources	Faculty, Students, and Advisory Board	Indirect
The Extent to which CLOs have been Achieved	Faculty, Program Leaders, Advisory Board, and Independent Opinion	Direct (as in section B) and Indirect/Surveys
	Students	Indirect
Other	-	-

Assessors (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	
REFERENCE NO.	

DATE	