هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

2023
TP-153

Course Specification

Course Title:	**Artificial Intelligence**
Course Code:	**212ENW-2**
Program:	**Environmental Protection Technology**
Department:	**--**
College:	**APPLIED COLLEGE IN Al-Arda**
Institution:	**Jazan University, Jazan**
Version:	**1st**
Last Revision Date:	**03\06\2024**

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A. General information about the course:

1. Course Identification

1. Credit hours: (2)					
2. Course type					
A.	☐University	■ College	■ Program	☐Track	☐Others
B.	■Required		☐Elective		
3. Level/year at which this course is offered: (Level 3/ Year 2)					
4. Course general Description:					

This course offers basic concepts of intelligence, innovation, achievements and advanced development in the areas of AI. It covers modern techniques for computers to represent task-relevant information and intelligent decisions system, solving problems by searching towards the achievement of goals. It covers some advanced , Robotics and Multi-Agent Systems basics.

5. Pre-requirements for this course (if any)**:NONE**

6. Co-requisites for this course (if any)**:NONE**

7. Course Main Objective(s):

Upon completion of the course, it is expected that the student will have acquired familiarity with the following concepts:

- **Understand the basic concepts of the Intelligence, Artificial Intelligence and innovative achievements in the development of AI.**
- **Identify and choose appropriate PEAS description, characteristics of environment and the agent architecture, for a given problem to be solved by an intelligent agent.**
- **Apply uninformed/ informed search strategies to solve a given search / optimization problem.**
- **Design and implement the concepts of Problem Solving and Algorithms.**
- **Identify the techniques in Planning, Learning, Robotics .**
- **Know and integrate various artificial intelligence techniques in intelligent system development and maintaining intelligent systems.**

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	30	100%
2	E-learning		
3	Hybrid • Traditional classroom • E-learning		---
4	Distance learning	---	---

3. Contact Hours (based on the academic semester)

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

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	**Describe** various Artificial Intelligent fundamentals and types of intelligent agents.	**K1**	Lecture, discussion in class	**Direct:** Quiz and mid-term & final Exams. **Indirect:** student survey
1.2	**Recognize** recent trends in robotics and their architectures.	**K2**	Lecture, discussion in class	**Direct**: Quiz and mid-term & final Exams. **Indirect:** student survey
2.0	**Skills**			
2.1	**Compare** different categories of learning.	**S1**	Lecture, discussion in class	**Direct**: Quiz and mid-term & final Exams. **Indirect:** student survey
2.2	**Evaluate** various search strategies and algorithms along with	**S2**	Lecture, discussion in class	**Direct:** Quiz and mid-term & final Exams. **Indirect:** student survey

Code	Course Learning Outcomes	Code of PLOs aligned with program	Teaching Strategies	Assessment Methods
	logic-based knowledge representation issues concepts & reasoning methods			
2.3	**Apply** algorithms for search techniques and AI Intelligent techniques for problem solving.	**S3**	Lecture, discussion in class	**Direct**: Quiz and mid-term & final Exams. **Indirect:** student survey
2.4	**Design** planning strategies to solve a planning problem.	**S4**	Lecture, discussion in class	**Direct**: Quiz and mid-term & final Exams. **Indirect:** student survey
2.5	**Analyze** the knowledge based agents and logical connectives.	**S5**	Lecture, discussion in class	**Direct**: Quiz and mid-term & final Exams. **Indirect:** student survey
3.0	**Values, autonomy, and responsibility**			
3.1	**Demonstrate** the ability to work in a team to implement the various AI algorithms and techniques.	**V1**	Lecture, discussion in class	**Direct:** Quiz and mid-term & final Exams. **Indirect:** student survey

C. Course Content

No	List of Topics	Contact Hours
1	**Introduction** to AI: - What is AI?, Characteristics of Intelligence Behavior, Goal, Advantages of AI ,Turing test approach,	4
2	**Applications** area of AI ,Categories of AI.	4
3	**Intelligent Agents**: - The structure of Agents, Agents and Environments, PEAS - Performance, Environment, Actuators, Sensors, Types of Intelligent Agents, Simple Reflex Agents, Model Based Reflex Agents, Utility Based Agents, Goal based agents, Summary, Exercises.	4
4	**Search Strategies:** - Problem Solving Agents, Well defined problems, 8 Puzzle. Real World Problem and Examples Search Strategies, Measuring Problems Solving Performance, Uninformed search Strategies DFS, UCS, DLS. Iterative, Comparison of Uniformed Search, Informed Search: - Greedy Best first search, A*, RBFS, Heuristic function.	6

5	**Robotics:** - Definition, Robot, characteristics of robot, Types of Robot: Industrial robot, Mobile Robot, Hybrid Robot, Types of Sensors, Robotic Perception, Properties of Robot, Types of Motion, Robotic Software Architecture, Programming languages, Application of Robotics.	6
6	**AI and Environmental Challenges:** nature and biodiversity loss Pollution, and waste Climate Change, Ocean Health, Healthy Air.	6
Total		**30**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1	Assignment – 1	Continuous	10%
2	Exam-1	Continuous	20%
3	Assignment – 2 or Quiz	Continuous	10%
4	Mini Project	9th Week	10%
5	Final Theory Exam	16th -18th Week	50%
Total			**100%**

*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	• Stuart Russell and Peter Norvig, Artificial Intelligence: A Modern Approach, Prentice Hall, 3rd Edition, 2010. ISBN-13: 978-0-13-604259-4.
Supportive References	• Coppin B. Artificial Intelligence Illuminated. Jones and Bartlett Publishers. Inc, 1st Edition, 2004. ISBN: 0-7637-3230-3. • Toshinori Munakata, Fundamentals of the New Artificial Intelligence: Neural, Evolutionary, Fuzzy and More, 2nd Edition, Springer, 2008, ISBN: 978-1- 84628-838-8. Tim Jones, Artificial Intelligence A Systems Approach, Infinity Science Press LLC, 2008, ISBN: 978-0-9778582-3-1.
Electronic Materials	• www.formal.stanford.edu/whatisai/whatisai.html • www.a-i.com • www.imdb.com /title/tt0212720/ • www.aima.cs.berkeley.edu *(A Modern Approach of AI)*

Other Learning Materials	----------

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	**Classroom equipped with projector and whiteboard and sufficient seating arrangements.** **Lab with software installed and individual computer terminal for each student.**
Technology equipment (projector, smart board, software)	**Smart board and projector** **Following software for lab work:** • **PYTHON** **Anaconda Python/ R Distribution- Free download** **Version 3.7 (64 bit or 34 bit)**
Other equipment (depending on the nature of the specialty)	**NA**

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students, Peer and program leader	Indirect (Course Evaluation Survey) - Indirect peer evaluation
Effectiveness of Students' assessment	Students, Program assessment committee	Direct/ Indirect
Quality of learning resources	Students, Faculty members	Direct/ Indirect
The extent to which CLOs have been achieved	Faculty members	Indirect
Verifying standards of student achievement / evaluation	HoD / committee nominated by HoD	Random re-checking of evaluated answer sheets
Achievement of course learning outcomes	Course Teachers / QAU	CLO assessment template that is further verified at course coordinator and QAU level.

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**BOARD OF DEPARTMENT**
REFERENCE NO.	
DATE	**03\06\2023**