



Course Description/ Prince Al Hussein bin Abdullah II Faculty of Information Technology

Department of: Information Systems

1. Instructor/ Coordinator

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2. Course Information

Level: 2	Course Title: Fundamentals of Intelligent Systems	Course No.: 902371
Class Time: 10:30 -11:30	Prerequisite / Co-requisite: 901210 : Object Oriented Programming	Course Type: Theoretical
Study Hours: 3	Semester: First	Academic Year : 2022/2023
Type of teaching: <input checked="" type="checkbox"/> Face to face <input type="checkbox"/> Blended (<input type="checkbox"/> 2:1 <input type="checkbox"/> 1:1 <input type="checkbox"/> 1:2) <input type="checkbox"/> Online		

3. Textbook(s)

Title	Artificial Intelligence: A Modern Approach
Author	Stuart Russell and Peter Norvig
Publisher	Prentice-Hall
Year	2020
Edition	4 rd edition
Textbook Website	

4. References (books and research published in periodicals or websites)

1-	Artificial Intelligence: A Modern Approach, 3 rd Edition.
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5. Course Description

Artificial Intelligent (AI) focus on developing machine that can think. AI can be defined as a branch of computer science that is concerned in the automation of intelligent behavior. In this course, we will study the most fundamental knowledge for understanding AI. We will introduce some basic search algorithms for problem solving; knowledge representation and reasoning; Genetic Programming; and neural networks as well as machine learning.

The main research topics in AI include: problem solving, reasoning, planning, natural language understanding, computer vision, automatic programming, and machine learning, and so on. Of course, these topics are closely related with each other. For example, the knowledge acquired through learning can be used both for problem solving and for reasoning. In fact, the skill for problem solving itself should be acquired through learning. Also, methods for problem solving are

useful both for reasoning and planning. Further, both natural language understanding and computer vision can be solved using methods developed in the field of pattern recognition.

6. Course Outcomes (CO's)

Upon successful completion of the course, student will be able to: (Use Bloom's Taxonomy Verbs)

CO#		SO
1.	Understanding the foundations of Artificial Intelligence	1
2.	Representing a problem as a search solving problem.	1
3.	Searching a space of answers for a solution to a problem in practical time.	4
4.	Representing intelligent behavior in terms of agent.	1
5.	Automated creation of complex plans in complex and unknown environments.	4

7. Course Contents

Week #	Topic	Chapter
1+2	Introduction and History of AI <ul style="list-style-type: none"> • What is AI • A brief history • The state of the art 	1
3 – 6	Intelligent Agents <ul style="list-style-type: none"> • Agents and environments • Rationality • PEAS (Performance measure, Environment, Actuators, Sensors) • Environment types • Agent types 	2
7-10	Solving Problem by Searching <ul style="list-style-type: none"> • Problem-solving agents • Problem types • Problem formulation • Example problems • Basic search algorithms 	3
	Informed search algorithms <ul style="list-style-type: none"> • Best-first search • A*_ search • Heuristics Search 	
	Midterm	6
14-15	Beyond Classical Search s <ul style="list-style-type: none"> • Hill-climbing • Simulated annealing • Genetic algorithms (briefly) • Local search in continuous spaces (very briefly) 	
	Adversarial Search <ul style="list-style-type: none"> • Games • Perfect play • minimax decisions • $\alpha-\beta$ pruning • Resource limits and approximate evaluation • Games of chance • Games of imperfect information 	
	Knowledge Representation and Reasoning <ul style="list-style-type: none"> • Knowledge-based agents 	

	<ul style="list-style-type: none"> • Logic in general models and entailment • Propositional (Boolean) logic • Equivalence, validity, satisfiability • Inference rules and theorem proving • forward chaining • backward chaining 	
	resolution	
Final Exam		

8. Teaching and learning Strategies and Evaluation Methods

	Evaluation /Measurement Method (Exam/ presentations/ discussion/ assignments)	Learning Activities	Teaching Strategies	Learning Outcomes
1.	In class Questions, Presentation, Quizzes, Exam	<ul style="list-style-type: none"> • Shared and Reciprocal questioning • Targeted Exercises • Group discussion assessments 	<ul style="list-style-type: none"> • Active learning • Differentiated instruction • Personalized learning • Convergent and divergent thinking • Problem-based learning • Media literacy • Summative assessment 	Communicate effectively in a variety of professional contexts.
2.	In class Questions, Presentation, Quizzes, Exam	<ul style="list-style-type: none"> • Case studies and Reflection • Goal-Setting Exercises • Group discussion • Media content assessments 	<ul style="list-style-type: none"> • Inquiry-based learning • Problem-based learning • Media literacy • Summative assessment 	Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
3.	In class Questions, Presentation, Participate in class Discussion, Doing quizzes.	<ul style="list-style-type: none"> • Case studies • Group discussion • Online media content • Team Project assessments 	<ul style="list-style-type: none"> • Project-based learning • Peer teaching • Problem-based learning • Media literacy 	Support the delivery, use, and management of information systems within an information systems environment.

9. Assessment

Distribution of grades	Assessment Time	Methods Used
30	Up to 11/12/2022	Midterm
20	During semester	<ul style="list-style-type: none"> • Couse Work (Quizzes, Assignments, Active Participation)
50	Up to 29/1/2023	Final Exam

**10. Program Educational Objectives (PEOs)
(To be added by the academic department)**

1.	Analyze complex computing problems, apply information systems principles, identify adequate solutions, and make informed decisions.
2.	Communicate and function effectively in a variety of professional organizational contexts.
3.	Join a successful profession in the fields of computing
4.	Follow-up life-long learning in the course of higher education, research, and professional development
5.	Contribute significantly to the community as a part of a team or individually with accountable, legal, ethical, and responsible practices.

11. Student Learning Outcomes for the Program. (SO's)

SO's (1-6)	Science Student Learning Outcomes for the Program
1	Analyze complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
2	Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the programs discipline.
3	Communicate effectively in a variety of professional contexts.
4	Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
5	Function effectively as a member or leader of a team engaged in activities appropriate to the programs discipline.

12. Mapping between Student Outcomes and Program Educational Objectives

	SO1	SO2	SO3	SO4	SO5
PEO1	x	x			
PEO2			x		x
PEO3					x
PEO4	x	x			
PEO5		x			x