



Course Specification

(Bachelor)

Course Title: Introduction to Artificial Intelligence Concepts and Applications

Course Code: CS101

Program:

Department: Computer Science

College: Computer Engineering and Science

Institution: Prince Sattam bin Abdulaziz University

Version: 1

Last Revision Date: Pick Revision Date.



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A. General information about the course:

1. Course Identification

1. Credit hours: (3)

2. Course type

A. ☒ University ☐ College ☐ Department ☐ Track ☐ Others
B. ☒ Required ☐ Elective

3. Level/year at which this course is offered: (1)

4. Course general Description:

This multidisciplinary course introduces students to the fundamental concepts, techniques, and applications of artificial intelligence (AI). The course uses common cases to illustrate the ideas and methods of AI in problem-solving in a straightforward, non-mathematical, and non-algorithmic approach. Topics include how an AI agent searches for a purpose, fulfills restrictions, and uses methodologies to make accurate predictions with practical applications using Microsoft Azure. The course also integrates modern machine learning tools and techniques, allowing students to gain hands-on experience in a real-world AI environment.

5. Pre-requirements for this course (if any):

None

6. Co-requisites for this course (if any):

None

7. Course Main Objective(s):

By the end of this course, students will:

- Acquire foundational knowledge of Artificial Intelligence (AI), including its history, key components, and its relevance across multiple disciplines.
- Understand the core concepts of intelligent agents, classical search techniques, constraint satisfaction problems, and basic machine learning models.
- Gain practical experience using Microsoft Azure AI services to implement and deploy AI solutions in a cloud-based environment.
- Explore applications of AI in various domains such as Natural Language Processing, Generative AI, Computer Vision, and Robotics.
- Identify and evaluate ethical, legal, and societal implications of AI technologies in real-world scenarios.



2. Teaching mode (mark all that apply)

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

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours	Percentage
1.	Lectures	2	60%
2.	Laboratory/Studio	1	40%
3.	Field		
4.	Tutorial		
5.	Others (specify)		
Total		3	100%

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

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Describe the key components of the AI field and its role in different majors.	K1	Lectures, Discussions	Quizzes, Exams
1.2	Recognize the history of AI and its foundations.	K1	Lectures, Discussions	Quizzes, Exams
2.0	Skills			



Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
2.1	Integrate Azure AI services, demonstrating a both theoretical understanding and practical skills with cloud-based tools.	S2	Interactive Labs	Assignments, Lab Evaluation, Project
2.2	Differentiate among the major types of machine learning.	S3	Lectures, Hands-on activities	Assignments, Lab Evaluation, Project
2.3	Explain selected topics (Natural Language Processing/Generative AI /Computer Vision / Robotics) related to AI and illustrate classification tasks using input features and predicted outputs.	S1	Interactive Labs, Case Studies	Assignments, Final Exam
2.4	Demonstrate understanding of AI applications and techniques, including intelligent agents, problem-solving, games, predictions, and other machine-learning models.	S1	Interactive Labs, Case Studies	Assignments, Lab Evaluation
3.0	Values, autonomy, and responsibility			
3.1	Demonstrate awareness of ethical and legal considerations in AI.	V2	Group Discussions, Case Studies	Assignments, Final Exam





C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to Artificial Intelligence (AI) 1- AI in Our Life 2-What is AI? 3- AI approaches 4- Compute Power: GPUs, TPUs, and Cloud AI	3
2.	Understanding AI Agents 1- The Concept of an AI Agent 2- What is an Environment in AI agents? 3- Types of AI Agents 4- The Agentic AI Era	3
3.	How AI Solves Problems: Smart Strategies for Decision-Making 1- Real-Life Examples of AI Problem-Solving Approaches 2- Introduction to Problem-Solving in AI 3- How AI Approaches Problem-Solving?	6
4.	Uncertainty in AI 1- Uncertainty in AI: Concepts and Applications 2-Where Does Uncertainty in AI Come From? 3- How Does AI Handle Uncertainty? 4- Basics of Probability 5- Probabilistic Inference in AI	3
5.	Machine learning Part (I): Introduction 1-Introduction to Machine Learning (ML) 2-Data: The Fuel for ML 3-Model: The Core Component of ML 4-ML Pipeline: From Problem to Deployment	6
6.	Machine learning Part (II): Artificial Neural Networks and Deep Learning 1-Artificial Neural Networks (ANN) 2- Deep Learning: End-to-End Learning 3- Convolutional Neural Networks (CNN) – Vision & Image Processing 4-Recurrent Neural Networks (RNN) – Sequential Data Processing	3
7.	Computer Vision (CV): Enabling a Machine to Interpret the Scene 1- What is CV? 2- Human Vision vs CV 3- CV vs Image Processing 4- Images and Videos: Navigating the Breadth of Visual Data Types 5- The Importance of CV in Today's World 6- CV Primary Tasks 7- CV Applications	6





8.	Natural Language Processing (NLP): Enabling a Machine to Understand and Generate Language 1- Introduction to NLP 2- Large Language Models (LLM)	6
9.	Generative Artificial Intelligence (Generative AI) 1- Introduction to (Generative AI) 2- Prompt Engineering	6
10.	AI Ethics 1- What is AI Ethics? 2- AI Ethics in Different Applications 3- Ethics in Computer Vision 4- Ethics in NLP & LLMs 5- Responsible AI - How to Make AI Fair & Safe? 6- Regulations & AI Laws	3
Total		45

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Assignments	During Term	10%
2.	Quizzes	During Term	20%
3.	Mid-term	Week 12	30%
4.	Final Exam	End of Semester	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	The lecture slides and the Microsoft AI900 and AZURE hands-on should provide all the information you need for this class; no textbooks are required. For more advanced topics or another perspective on the same material, here are some great resources: "Artificial Intelligence: foundations of computational agents" 3 rd Edition, Cambridge University Press, 2023, by David L. Poole and Alan K. Mackworth "Artificial intelligence: a modern approach", 4 th Edition, Pearson, 2021, by Russell Stuart and Peter Norvig
Supportive References	OpenAI's Prompt Engineering Guide





	https://platform.openai.com/docs/guides/prompt-engineering SDAIA Publications https://sdaia.gov.sa/ar/MediaCenter/KnowledgeCenter/Pages/SDAIPublications.aspx
Electronic Materials	Free-Access Tools and Platforms: Microsoft Azure: https://azure.microsoft.com/en-us/ Google Teachable Machine (No-code ML): https://teachablemachine.withgoogle.com/
Other Learning Materials	

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	
Technology equipment (projector, smart board, software)	
Other equipment (dependent on the nature of the specialty)	

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students, Faculty	Surveys, Peer Review
Effectiveness of Students assessment	Faculty, Academic Leaders	Exam Analysis, Student Feedback
Quality of learning resources	Program Leaders	Review of Course Materials
The extent to which CLOs have been achieved		
Other		

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	COLLEGE COUNCIL
REFERENCE NO.	16
DATE	21 APRIL 2025

