2023
TPG-153

Course Specification

(Postgraduate)

Course Title:	Artificial Intelligent
Course Code:	501819-3
Program:	Master of Artificial Intelligence
Department:	Computer Science
College:	Computers and Information Technology
Institution:	Taif University
Version:	V2
Last Revision Date:	5 May 2024

قسم علوم الحاسب
Computer Science Department
TU جامعة الطائف TAIF UNIVERSITY

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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
B.	☐ Required		☒ Elective	
3. Level/year at which this course is offered: (Year: 1, Level: 2)				
4. Course General Description:				
Artificial Intelligence is one of the branches in computer science concerned with methods to emulate the intelligence of human being and biological evolution in general. Hence, various topics that expose students to the advancement of AI would range from knowledge engineering, ontologies, automated reasoning, machine learning, expert system, computational linguistics, swarm intelligence, evolutionary computing and other topics related to soft computing. The applications of artificial intelligence methods and techniques in the industries are discussed and explored and the innovations are applied to increase the efficiencies and effectiveness in business production, decision makings and improvement to human life.				
5. Pre-requirements for this course (if any)**:**				
None.				
6. Co-requirements for this course (if any)**:**				
None.				
7. Course Main Objective(s):				
The purpose of this course is to provide various topics about Artificial Intelligence (AI) in order to expose students to grasp the methodologies and techniques of both symbolic and non-symbolic of Artificial Intelligence in order to resolve industrial problems.				

2. Teaching Mode: (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	**36**	**80%**
2	E-learning	**9**	**20%**
3	Hybrid ▪ Traditional classroom ▪ E-learning	**0**	**0%**
4	Distance learning	**0**	**0%**

3. Contact Hours: (based on the academic semester)

No	Activity	Contact Hours

1.	**Lectures**	**45**
2.	**Laboratory/Studio**	**-**
3.	**Field**	**-**
4.	**Tutorial**	**-**
5.	**Others (Mid-Term & Final Exams)**	-
	Total	**45**

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	Discuss various types of knowledge representation techniques and reasoning methods.	**K1**	Lecture Brainstorming Self-learning	**Direct:** Quiz, **Indirect:** Survey
1.2	Explain the various concepts of soft computing techniques and methods.	**K1**	Lecture Brainstorming Self-learning	**Direct:** Quiz, , Exam **Indirect:** Survey
2.0	**Skills**			
2.1	Build some functionalities using AI tools to simulate the human intelligence in solving real world problem.	**S2**	Lecture Brainstorming Self-learning	**Direct:** Quiz, Exam **Indirect:** Survey
2.2	Able to justify the choice of the AI techniques in problem solving.	**S1**	Lecture Project Self-learning	**Direct:** Quiz, Project, Exam **Indirect:** Survey
2.3	Design, analyze and assess new learning models in AI.	**S2**	Lecture Self-learning	**Direct:** Quiz, Project, Exam
2.6	Evaluate new technologies in AI field and communicate effectively in a variety of professional contexts.	**S3**	Lecture Project Self-learning	**Direct:** Project, Exam **Indirect:** Survey
3.0	**Values, autonomy, and responsibility**			
3.1	Function effectively as a member or leader of a team engaged in activities appropriate to the field of AI.	**V2**	Discussion, Project	**Direct:** Project **Indirect:** Survey

C. Course Content:

No	List of Topics	Contact Hours
1.	Knowledge representation and reasoning – rule-based system and expert system application for expert knowledge building	6
2.	Knowledge representation and reasoning – case-based reasoning in diagnostics	6
3.	Knowledge representation and reasoning – ontology, qualitative reasoning, qualitative modeling for industrial automation	6
4.	Reasoning with uncertainties – probabilistic reasoning, fuzzy logic and truth maintenance for decision makings in business	6
5.	Soft Computing – Evolutionary algorithms: Genetic algorithms, Genetic programming for control systems in engineering problems	6
6.	Soft Computing – Machine learning: Data Mining, Artificial Neural Network, Clustering algorithms for prediction	9
7.	Computational Linguistics – Natural language processing, Text Mining, Information Extraction for building chat bot, intelligent agents	6
	Total	45

D. Students Assessment Activities:

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quiz 1 – AI in knowledge building	2nd week	10%
2.	Quiz 2 – AI in diagnostics	4th week	10%
3.	Quiz 3 – AI in automation	6th week	10%
4.	Quiz 4 – AI in decision making	8th week	10%
5.	Quiz 5 – AI in engineering problems	10th week	10%
6.	Project & Student presentation	12th week	20%
7.	Final Exam – AI in Soft Computing (Prediction) and Computational Linguistics	15th Week	30%

*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	▪ Zhongzhi Shi, Advanced Artificial Intelligence: Series on Intelligence Science (2011). World Scientific https://doi.org/10.1142/7547 ▪ Lior Rokach and Oded Maimon, Data Mining with Decision Trees (2014). World Scientific https://doi.org/10.1142/9097

	▪ Robert Bembenik, Lukasz Skonieczny, Grzegorz Protaziuk, Marzena Kryszkiewicz, Henryk Rybinski, Intelligent Methods and Big Data in Industrial Applications, Springer International Publishing (2018), ISBN 9783319776040.
Supportive References	▪ Zhongzhi Shi, Advanced Artificial Intelligence: Series on Intelligence Science, 2end Ed, (2011). World Scientifichttps://doi.org/10.1142/7547
Electronic Materials	▪ https://ai-on.org/ ▪ https://plus.google.com/communities/116461000134682563789
Other Learning Materials	▪ Links provided by the instructor. ▪ Handouts and Presentations Slides prepared by the instructor. ▪ Blackboard.

2. Educational and Research Facilities and Equipment Required:

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	▪ Classroom (20 students/class) ▪ Computer labs
Technology equipment (Projector, smart board, software)	▪ Video projector / data show ▪ White board
Other equipment (Depending on the nature of the specialty)	▪ To be announced during the course!

F. Assessment of Course Quality:

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students Coordinator	Indirect (Course exit survey) Indirect (Feedback from Course Coordinator)
Effectiveness of students assessment	Faculty member Coordinator	Indirect (Feedback from Faculty member) Indirect (Feedback from Course Coordinator)
Quality of learning resources	Students Faculty member Coordinator Council Curriculum Committees	Indirect (Course exit survey) Indirect (Feedback from Faculty member) Indirect (Feedback from Course Coordinator) Indirect (Feedback from council) Indirect (Feedback from Graduate Committees)
The extent to which CLOs have been achieved	Students Faculty member Coordinator Curriculum Committees	Indirect (Course exit survey) Indirect (Feedback from Faculty member/ Course Coordinator/ Graduate Committee)
Other	-	-

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

Assessment Methods (Direct, Indirect)

G. Specification Approval Data:

COUNCIL /COMMITTEE	GRADUATE PROGRAMS COMMITTEE – CS DEPT.
REFERENCE NO.	V1
DATE	24/1/2024

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