



Course Specification

— (Bachelor)

Course Title: Pattern Recognition

Course Code: 501583-3

Program: Bachelor of Computer Science

Department: Department of Computer Science

College: College of Computers and Information Technology

Institution: Taif University

Version: 1

Last Revision Date: 1-02-2024



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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: 10th Level/5th Year

4. Course general Description:

This course introduces students to basic pattern recognition theories and methodologies. Topics include: introduction to pattern recognition, Bayesian decision theory, parametric and non-parametric methods, feature extraction, selection and reduction, classifiers, unsupervised learning and clustering. Applications of the mentioned topics for solving real-world problems will be introduced using appropriate programming algorithms.

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

501324-3

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

202364-3

7. Course Main Objective(s):

At the end of this course, students will be able to:

- understand different concepts and approaches of pattern recognition.
- understand different methods of feature extraction, feature selection and reduction.
- apply supervised and unsupervised classification methods used in a pattern recognition system.





2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	2	67%
2	E-learning	1	33%
3	Hybrid <ul style="list-style-type: none"> • 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 (specify)	-
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	Understand basic concepts and approaches of pattern recognition and machine intelligence algorithms	K1	Lecture	Direct Quizzes /Exams Indirect Course Exit Survey
1.2	Understand the basic methods of feature extraction, feature reduction and evaluation.	K1	Lecture	Direct Quizzes /Exams Indirect Course Exit Survey
1.3	Understand both supervised and unsupervised classification methods to detect and characterize patterns in real-world data	K1	Lecture	Direct Quizzes /Exams Indirect Course Exit Survey
2.0	Skills			





Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
2.1	Apply pattern recognition techniques in real-world problems	S1	Lecture Project	Direct Quizzes /Exams Indirect Course Exit Survey
2.2				
2.3				
2.4				
3.0	Values, autonomy, and responsibility			
3.1				
3.2				

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction – Pattern Recognition system and basic concept	6
2.	Overview of statistics, random vectors, and linear algebra.	3
3.	Bayesian Decision Theory	6
4.	Parametric and Non-parametric methods	6
5.	Mid-term exam	1
6.	Feature extraction, selection and Reduction	6
7.	Classifiers	6
8.	Unsupervised Learning and Clustering	6
9.	Applications : pattern recognition techniques in practical problems	5
Total		45

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	HomeWorks /Student Participation-Attendance	Every Week	10%
2.	Quizzes	Week 4 and 12	5%
3.	Project	From Week 9	20%
4.	Mid-Term	Week 7	25%
5.	Final Examination	Week 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	Pattern Recognition and Machine Learning by Christopher Bishop Publisher: Springer Science, Edition 2006, ISBN-10: 0387310738
Supportive References	
Electronic Materials	
Other Learning Materials	

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	<ul style="list-style-type: none"> Classroom with 20 chairs
Technology equipment (projector, smart board, software)	<ul style="list-style-type: none"> Video projector / data show White board
Other equipment (depending on the nature of the specialty)	

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	<ul style="list-style-type: none"> Students Faculty members Coordinator Council Curriculum Committees 	<ul style="list-style-type: none"> Course exit survey Feedback from Faculty members Feedback from Course Coordinator Feedback from council Feedback from Curriculum Committees
Effectiveness of Students assessment	<ul style="list-style-type: none"> Students Faculty members Coordinator Council Curriculum Committees 	<ul style="list-style-type: none"> Course exit survey Feedback from Faculty members Feedback from Course Coordinator Feedback from council Feedback from Curriculum Committees
Quality of learning resources	<ul style="list-style-type: none"> Students Faculty members 	<ul style="list-style-type: none"> Course exit survey



Assessment Areas/Issues	Assessor	Assessment Methods
	<ul style="list-style-type: none"> Coordinator Council Curriculum Committees 	<ul style="list-style-type: none"> Feedback from Faculty members Feedback from Course Coordinator Feedback from council Feedback from Curriculum Committees
The extent to which CLOs have been achieved	<ul style="list-style-type: none"> Students Faculty members Coordinator Council Curriculum Committees 	<ul style="list-style-type: none"> Course exit survey Feedback from Faculty members Feedback from Course Coordinator Feedback from council Feedback from Curriculum Committees
Other		

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	CS council
REFERENCE NO.	Meeting #11
DATE	07/03/2024

