





# **Course Specification**

— (Postgraduate Programs )

**Course Title** Pattern Recognition

Course Code: MSCS 723

**Program: Master Programme in Computer Science** 

**Department: Computer Science** 

**College:** Computer Science and Information Technology

Institution: King Faisal University

Version: Course Specification Version Number

**Last Revision Date:** *Pick Revision Date.* 







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# A. General information about the course:

### **1. Course Identification:**

### 1. Credit hours: 3 (3-0-6)

2. Course type	2.	Course	type
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B.	Required		🖾 El	ective
Α.	□University	⊠ College	□Departmen	t 🗆 Track

3. Level/year at which this course is offered: : Level 2 , 3 or 4

### 4. Course General Description:

This course will introduce the fundamentals of statistical pattern recognition, focusing first on generative methods such as those based on Bayes decision theory and related techniques of parameter estimation and density estimation. Next, the course introduces discriminative methods such as nearest-neighbors classification and support vector machines. Methods of pattern recognition are useful in many applications such as information retrieval, data mining, document image analysis and recognition, computational linguistics, forensics, biometrics and bioinformatics

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

NA

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

NA

### 7. Course Main Objective(s):

The main purpose of this course is to provide students with the basic concepts and techniques of Bayes decision theory, related techniques of parameter estimation, density estimation, support vector machines, data mining, document image analysis and recognition

#### 2. Teaching Mode: (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom		
2	E-learning		
3	<ul><li>Hybrid</li><li>Traditional classroom</li><li>E-learning</li></ul>	45	100%
4	Distance learning		





# 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	Code of PLOs aligned	Teaching	Assessment	
code	Outcomes	with program	Strategies	Methods	
1.0	Knowledge and understanding				
1.1	Ability to describe fundamental concepts in pattern recognition	К1	Lectures	- Quizzes - Exams - Assignments	
2.0	Skills				
2.1	Applymathematicalandalgorithmicprinciplesindesigningpatternrecognition systems	S1, S2	- Lectures	- Quizzes - Exams - Assignments	
2.2	Identify the limitations of different pattern recognition techniques	S1	- Lectures	- Quizzes - Exams - Assignments	
3.0	Values, autonomy, and	d responsibility			
3.1	Apply a range of pattern Recognition techniques for applying in real world problem	V1	<ul> <li>- Lectures</li> <li>- Case studies</li> <li>-Research</li> <li>assignment</li> </ul>	Project Report and Presentation	





# **C. Course Content:**

No	List of Topics	Contact Hours
1	Introduction	3
2	Neural Networks	6
3	Kernel Methods	6
4	Graphical Methods	6
5	Mixture Models and Expectation-Maximization (EM)	6
6	Approximate Inference	6
7	Sampling Methods	3
8	Continuous Latent Variables	3
	Total	45

# **D. Students Assessment Activities:**

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Assignments	Continuous	10%
2.	Quiz	Continuous	5%
3.	Mid Term	8 <sup>th</sup> - 9 <sup>th</sup>	30%
4	Capstone Project	15 <sup>th</sup>	15%
5	Final Exam	16 <sup>th</sup> - 17 <sup>th</sup>	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:**

Required Textbook	Bishop, C. M. 2006. Pattern Recognition and Machine Learning. New York: Springer		
Essential References	Duda, R. O., Hart, P. E. and Stork, D. G. 2001. Pattern Classification, 2nd Edition. New York: Wiley & Sons		
Supportive References			
Electronic Materials	• IEEE/ACM Journal / Conference Papers on Software Engineering		
Other Learning Materials	• Electronic Materials, Web Sites etc. for any recent resources related to Pattern Recognition		

# **2.** Educational and Research Facilities and Equipment Required:

Items	Resources	
<b>facilities</b> (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Sufficient seats (typically 20) as per student registration required in the lecture	





Items	Resources
<b>Technology equipment</b> (Projector, smart board, software)	Sufficient computer terminals with required setup having the necessary software installed and configured for the students to complete assignments and projects. Data show is needed to demonstrate in the class
<b>Other equipment</b> (Depending on the nature of the specialty)	Not Required

# F. Assessment of Course Quality:

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect Assessment through Teaching Evaluation
Effectiveness of students' assessment	Faculty	IndirectassessmentthroughCourseEvaluation Survey
Quality of learning resources	Students	IndirectAssessmentthroughLearningResources Survey
The extent to which CLOs have been achieved	Faculty	Direct assessment through Rubrics analyses
Other		

Assessor (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify) Assessment Methods (Direct, Indirect)

# **G. Specification Approval Data:**

COUNCIL /COMMITTEE	
REFERENCE NO.	
DATE	

