



Course Specification

— (Bachelor)

Course Title: Machine learning 1

Course Code: DSC 311

Program: Applied Statistics & Data Management

Department: Mathematics

College: College of Science

Institution: Majmaah University, Saudi Arabia

Version: 2023^h

Last Revision Date: 19-9-2023



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A. General information about the course:

1. Credit hours: (3(2+2))

2. Course type

A. University College Department Track Others

B. Required Elective

3. Level/year at which this course is offered: (5/3)

4. Course general Description:

Algorithmic models of learning, Learning classifiers, functions, relations, grammars, probabilistic models, value functions, behaviors and programs for experience. Bayesian, maximum some posterior, and minimum description length frameworks.

Parameter Estimation, sufficient statistics, decision trees, neural networks, support vector machines, Bayesian networks, bag of words classifiers, N-gram models; Markov and Hidden Markov models, probabilistic relational models, association rules, nearest neighbor classifiers, locally weighted regression, ensemble classifiers

5. Pre-requirements for this course (if any): STS 121 Introduction of Statistics

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

7. Course Main Objective(s):

- To explain about the basics of machine learning.
- To explain the main topics in the ML models.

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	30	75%
2	E-learning		
3	Hybrid <ul style="list-style-type: none"> • Traditional classroom 		





No	Mode of Instruction	Contact Hours	Percentage
	• E-learning		
4	Distance learning	10	25%

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	30
2.	Laboratory/Studio	
3.	Field	
4.	Tutorial	
5.	Others (specify)	10
Total		40

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	Understanding of the strengths and weaknesses of many popular machine learning approaches.	K1	Lectures Presentations Media Lectures Tutorials	Homework Quiz Mid Exam Final Exam Exam
1.2				
...				
2.0	Skills			
2.1	Understanding of the fundamental issues and challenges of machine learning: data, model selection, model complexity, etc..	S1	Lectures Presentations Media Lectures Tutorials	Homework Quiz Mid Exam Final Exam- Exam





Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
2.2				
...				
3.0	Values, autonomy, and responsibility			
3.1				
3.2				
...				

C. Course Content

No	List of Topics	Contact Hours
1.	Algorithmic models of learning, Learning classifiers, functions, relations, grammars, probabilistic models, value functions, behaviors and programs for experience	17
2.	Bayesian, maximum some posterior, and minimum description length frameworks.	10
---	Parameter Estimation, sufficient statistics, decision trees, neural networks, support vector machines, Bayesian networks, bag of words classifiers	17
	N-gram models; Markov and Hidden Markov models, probabilistic relational models, association rules, nearest neighbor classifiers, locally weighted regression, ensemble classifiers. s.	16
Total		60

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm	7th, week	30 %
2.	Activities	Through of semester	10 %
3.	Quizzes	Through of semester	%10
4.	Electronic Test	10th week	10 %
5.	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	Pattern Recognition and Machine Learning
Supportive References	Artificial Intelligence: A Modern Approach.
Electronic Materials	
Other Learning Materials	

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom with capacity of 20 -students.
Technology equipment (projector, smart board, software)	projector, smart board
Other equipment (depending on the nature of the specialty)	

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students/ internal committee	Direct (Students evaluation electronically organized by Deanship of registration and admission)/ Verification of students' papers
Effectiveness of Students assessment	Staff members (Peer Reviewer)	Indirect (Frequent meetings consultation among the teaching staffs)
Quality of learning resources	Staff members (course coordinators)	Direct (Meeting between course coordinators and the tutors)
The extent to which CLOs have been achieved	Students/ internal committee	Direct (Students evaluation electronically organized by Deanship of registration and admission)/ Verification of students' papers
Other		

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	
REFERENCE NO.	





DATE

