



Course Specification of Data Mining and warehousing

Course No (.....)

2020/2021

Course Specification of Data Mining and warehousing

I. Course Identification and General Information:

1	Course Title:	Data Mining and warehousing
2	Course Code & Number:	

Head of Department

Vise Dean for Quality Assurance

Dean of the Faculty

Dean of Development center and Quality Assurance

Assoc. Prof. Mansour N. Ali

Dr. Anwar Al-Shamiri

Dr. Nagi Al-Shibani

Assoc. Prof. Dr.Huda Al.Emad

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3	Credit hours:	C.H				TOTAL
		Th.	Seminar	Pr	Tr.	
		3				
4	Study level/ semester at which this course is offered:	3 rd Level-2 nd semester				
5	Pre –requisite (if any):	Programming Fundamentals				
6	Co –requisite (if any):	None				
7	Program (s) in which the course is offered:	Computer Science				
8	Language of teaching the course:	English/Arabic				
9	Study System	Term Based System				
10	Mode of delivery:	Full Time				
11	Location of teaching the course:	Faculty of Computer and Information Technology				
12	Prepared By:	Dr.Ibrahim Al-Baltah				
13	Date of Approval					

II. Course Description:

This course is an introductory course on data mining. It introduces students with the fundamental concepts, methods, algorithms, and techniques. This course covers wide range of data mining topics including an introduction to kinds of data can be mined, basic statistical descriptions of data, data visualization, data preprocessing, data warehousing and online analytical processing, data cube

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technology, mining frequent patterns, association and correlations, classification, and cluster anal

III. Course Intended learning outcomes (CILOs) of the course (maximum 8CILOs)		Referenced PILOs (Only write code number of referenced Program Intended learning outcomes)
a.1	Demonstrate an understanding of the essential concepts, methods, and techniques of data mining.	A2, A3
a.2	Define the benefits of knowledge discovery, data warehousing, data cube, frequent pattern mining, classification, and clustering.	A4
b.1	Discuss the crucial role of data preprocessing, data cube and OLAP in knowledge discovery.	B1
b.2	Analyze and evaluate the differences between supervised and unsupervised learning techniques.	B2
c.1	Apply various data mining techniques for knowledge discovery.	C1
c.2	Employ different classification and clustering methods for extracting the acquired knowledge.	C4
d.1	Work effectively either individually or in groups to accomplish the assigned task.	D1
d.2	Effectively communicate, leadership management, team cooperation, labor division and moderate the integration of ability.	D4

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(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1- Demonstrate an understanding of the essential concepts, methods, and techniques of data mining.	Active lectures, interactive class discussions, exercises and home works, laboratory based session, problem solving, interactive class discussions	Written tests, assignments
a2- Define the benefits of knowledge discovery, data warehousing, data cube, frequent pattern mining, classification, and clustering.	Active lectures, interactive class discussions, exercises and home works, laboratory based session, problem solving, interactive class discussions	Written tests, assignments

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1- Discuss the crucial role of data preprocessing, data cube and OLAP in knowledge discovery.	Active lectures, interactive class discussions, exercises and home works, laboratory based session, problem solving, interactive class discussions	Written tests, assignments, Coursework Activities, practical lab sessions

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b2- Analyze and evaluate the differences between supervised and unsupervised learning techniques.	Active lectures, interactive class discussions, exercises and home works, laboratory based session, problem solving, interactive class discussions	Written tests, assignments, Coursework Activities, practical lab sessions
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(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1- Employ different classification and clustering methods for extracting the acquired knowledge.	Exercises and home works, laboratory based session, directed self- study/ Independent learning, Problem solving	Written tests, assignments, Coursework Activities, project, practical lab sessions
c2- Work effectively either individually or in groups to accomplish the assigned task.	Exercises and home works, laboratory based session, directed self- study/ Independent learning, Problem solving	Written tests, assignments, Coursework Activities, project, practical lab sessions

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1- Work effectively either individually or in groups to accomplish the assigned task.	Project, directed self- study/ independent learning, team work (group learning)	Assignments and project

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d2- Effectively communicate, leadership management, team cooperation, labor division and moderate the integration of ability.	Project, directed self- study/ independent learning, team work (group learning)	Assignments and project
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IV. Course Content:					
A – Theoretical Aspect:					
Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
1	Introduction	a1, a2	<ul style="list-style-type: none"> - Why Data Mining? - What Kinds of Data Can Be Mined? - What Kinds of Patterns Can Be Mined? - Which Technologies Are Used? - Which Kinds of Applications Are Targeted? - Major Issues in Data Mining 	1	3
2	Getting to Know Your Data	a1, a2,	<ul style="list-style-type: none"> - Data Objects and Attribute Types - Basic Statistical Descriptions of Data - Data Visualization - Measuring Data Similarity and Dissimilarity 	1	3
3	Data Preprocessing	a1, b1, c1	<ul style="list-style-type: none"> - Data Preprocessing: An Overview 	2	6

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			<ul style="list-style-type: none"> - Data Cleaning - Data Integration - Data Reduction - Data Transformation and Data Discretization 		
4	Data Warehousing and Online Analytical Processing	a1, a2, b1	<ul style="list-style-type: none"> - Data Warehouse: Basic Concepts - Data Warehouse Modeling: Data Cube and OLAP - Data Warehouse Design and Usage - Data Warehouse Implementation - Data Generalization by Attribute-Oriented Induction 	2	6
5	Data Cube Technology	a1, a2, b1, c1	<ul style="list-style-type: none"> - Data Cube Computation: Preliminary Concepts - Data Cube Computation Methods - Processing Advanced Kinds of Queries by Exploring Cube - Technology - Multidimensional Data Analysis in Cube Space 	1	3
6	Mining Frequent Patterns, Associations, and Correlations: Basic Concepts and Methods	a1, a2, c1	<ul style="list-style-type: none"> - Basic Concepts - Frequent Itemset Mining Methods - Which Patterns Are Interesting?—Pattern Evaluation Methods 	2	6
	Classification: Basic Concepts	a1, a2, b2, c1, c2	<ul style="list-style-type: none"> - Basic Concepts - Decision Tree Induction - Bayes Classification Methods 	2	6

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			- Rule-Based Classification - Model Evaluation and Selection		
7	Cluster Analysis: Basic Concepts and Methods	a1, a2, b2, c1, c1	- Cluster Analysis - Partitioning Methods - Hierarchical Methods - Density-Based Methods - Grid-Based Methods - Evaluation of Clustering	2	6
8	Final project discussion	d1, d2		1	3
Number of Weeks /and Units Per Semester				14	42

B - Practical Aspect: (if any)				
Order	Tasks/ Experiments	Number of Weeks	contact hours	Learning Outcomes
1				
2				
3				
4				
5				
6				
7				
8				
Number of Weeks /and Units Per Semester				

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V. Teaching strategies of the course:

Active lectures
Seminar/ project/presentation
Interactive class discussions
Exercises and home works
Laboratory based session
Directed self- study/ Independent learning
Problem solving
Team work (group learning)

VI. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
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1	Students should be divided into groups, and each group must select a real case study and dataset. Every group should perform data preprocess and apply at least five different mining techniques and write a technical report about the steps that were carried out and explain in details the final results from every technique.	a1,a2,b1,b2 ,c1,c2, d1, d2	15 th week	30
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VII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Assignment	15 th week	30	30%	a1,a2,b1,b2 ,c1,c2, d1, d2
2	Mid Exam	7 th week	10	10%	a1,a2,b1,b2 ,c1,c2
3	Final Exam	16 th week	60	60%	a1,a2,b1,b2 ,c1,c2

VIII. Learning Resources:

- *Written in the following order: (Author - Year of publication - Title - Edition - Place of publication - Publisher).*

1- Required Textbook(s) (maximum two).

1- H. Jiawei, K. Micheline and P. Jian, 2012, Data Mining: Concepts and Techni
Third Edition, Elsevier.

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	2- Mehmed Kantardzic, 2020, Data Mining: Concepts, Models, Methods, and Algorithms, Third Edition, Wiley.
2- Essential References.	
	1- Rajan Chattamvelli, 2016, Data Mining Methods, Second Edition, Alpha Science International Limited. 2- Sang Suh, 2012, Practical Applications of Data Mining, Jones & Bartlett. 3- Max Bramer, 2016, Principles of Data Mining, Third Edition, Springer.
3- Electronic Materials and Web Sites etc.	
	1- https://www.guru99.com/data-mining-tutorial.html 2- https://www.tutorialspoint.com/data_mining/index.htm 3- https://www.wisdomjobs.com/e-university/data-mining-tutorial-199.html



IX. Course Policies:	
1	<p>Class Attendance:</p> <ul style="list-style-type: none"> students are allowed one absence without a required written excuse for every semester credit hour taken. For all students who exceed the specified amount of unexcused absentees, an official documented excuse from the university may be required by the instructor It is the student's responsibility and entitlement to meet and discuss all absences or planned absences with their instructors. All students must notify the Office of Student Affairs/Judicial Affairs for any emergencies that require immediate exemption from university grounds within a period of 48 hours. No student shall neglect more than 20% of their class attendance, whether excused or unexcused, in a given semester. Upon the prudence and judgment of the instructor, a course grade of "FA" may be given to any student who exceeds 25% of absentees in a semester. The Office of Student Affairs/Judicial Affairs is officially responsible for issuing class excuses for legitimate purposes. Once a student reaches approximately ten to fifteen percent of absentees in a class, he/she shall receive a warning. The Chair of the respective program has the right to permit a student's withdrawal from a course, if presented with a suitable and acceptable explanation for excessive absentees. This will be coordinated and is with the consent of the Registrar.
2	<p>Tardy:</p> <ul style="list-style-type: none"> -If a student is tardy three times to class, it is automatically counted as an absence. Each instructor is responsible to define the rules for which a student is considered late to class.
3	<p>Exam Attendance/Punctuality:</p> <ul style="list-style-type: none"> - All students have to attend exam as specified. Student who fails to attend the exam has to bring documented reasons All students must come to exam on time and no excuses are accepted for late coming.

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4	<p>Assignments & Projects:</p> <ul style="list-style-type: none"> All assignment and projects have to be submitted, as scheduled, on time. Late submission causes deduction of marks.
5	<p>Cheating:</p> <ul style="list-style-type: none"> All students are required and are expected to act and behave according to the Academic Integrity Code and Standards of Conduct as explained and detailed in the student handbook. Punitive actions for any and all students not abiding by these rules is also outlined in the student handbook. Any student caught in the act of or is suspected of cheating will automatically receive a grade of "0" for that exam, quiz, project, or assignment and be suspended from the university for the semester period. Any recurring attempt in cheating will be a matter for immediate dismissal from the University. Any student who assists, contributes, or in any way is found to be involved in helping another student cheat will receive an equivalent and equal penalty.
6	<p>Plagiarism:</p> <ul style="list-style-type: none"> Regulations will be pursued and enforced on any plagiarism attempts.
7	<p>Other policies:</p> <p>-</p>

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Faculty of Computer & Information Technology

Department of Computer Science

Program of Computer Science

Course syllabus of Data Mining and warehousing

Course No (.....)

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2020/2021

Template for Course Plan (Syllabus)

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location & Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Identification and General Information:					
1-	Course Title:	Data Mining and warehousing			
2-	Course Number & Code:				
3-	Credit hours:	C.H			Total
		Th.	Seminar	Pr.	
		3	-	-	-
4-	Study level/year at which this course is offered:	3 rd Level-2 nd semester			
5-	Pre -requisite (if any):	Programming Fundamentals			

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6-	Co –requisite (if any):	None
7-	Program (s) in which the course is offered	Computer Science
8-	Language of teaching the course:	English/Arabic
9-	System of Study:	Term based system
10-	Mode of delivery:	Full Time
11-	Location of teaching the course:	Faculty of Computer and Information Technology

III. Course Description:

This course is an introductory course on data mining. It introduces students with the fundamental concepts, methods, algorithms, and techniques. This course covers wide range of data mining topics including an introduction to kinds of data can be mined, basic statistical descriptions of data, data visualization, data preprocessing, data warehousing and online analytical processing, data cube technology, mining frequent patterns, association and correlations, classification, and cluster analysis.

IV. Intended learning outcomes (ILOs) of the course:

- Brief summary of the knowledge or skill the course is intended to develop:

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- 1- Demonstrate an understanding of the essential concepts, methods, and techniques of data mining.
- 2- Define the benefits of knowledge discovery, data warehousing, data cube, frequent pattern mining, classification, and clustering.
- 3- Discuss the crucial role of data preprocessing, data cube and OLAP in knowledge discovery.
- 4- Analyze and evaluate the differences between supervised and unsupervised learning techniques.
- 5- Apply various data mining techniques for knowledge discovery.
- 6- Employ different classification and clustering methods for extracting the acquired knowledge.
- 7- Work effectively either individually or in groups to accomplish the assigned tasks.
- 8- Effectively communicate, leadership management, team cooperation, labor division and moderate the integration of ability.

V. Course Content:

- Distribution of Semester Weekly Plan of Course Topics/Items and Activities.

A – Theoretical Aspect:

Order	Topics List	Week Due	Contact Hours
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1	Introduction	1 st week	3
2	Getting to Know Your Data	2 nd week	3
3	Data Preprocessing	3 rd and 4 th week	6
4	Data Warehousing and Online Analytical Processing	5 th and 6 th week	6
5	Mid Exam	7 th week	3
6	Data Cube Technology	8 th week	3
7	Mining Frequent Patterns, Associations, and Correlations: Basic Concepts and Methods	9 th and 10 th week	6
8	Classification: Basic Concepts	11 th and 12 th week	6
9	Cluster Analysis: Basic Concepts and Methods	13 th and 14 th week	6
10	Final project discussion	15 th week	3
11	Final exam	16 th week	3
Number of Weeks /and Units Per Semester		16	48

B – Practical Aspect: (if any)

Order	Topics List	Week Due	Contact Hours
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1			
2			
3			
Number of Weeks /and Units Per Semester			

VI. Teaching strategies of the course:

Active lectures
Seminar/ project/presentation
Interactive class discussions
Exercises and home works
Laboratory based session
Directed self- study/ Independent learning
Problem solving
Team work (group learning)

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VII. Assignments:				
No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Students should be divided into groups, and each group must select a real case study and dataset. Every group should perform data preprocess and apply at least five different mining techniques and write a technical report about the steps that were carried out and explain in details the final results from every technique.	a1,a2,b1,b2 ,c1,c2, d1, d2	15 th week	30

VIII. Schedule of Assessment Tasks for Students During the Semester:				
Assessment	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment
1	Assignment	15 th week	30	30%
2	Mid Exam	7 th week	10	10%
3	Final Exam	16 th week	60	60%

IX. Learning Resources:
<ul style="list-style-type: none"> Written in the following order: (Author – Year of publication – Title – Edition – Place of publication – Publisher).
1- Required Textbook(s) (maximum two).
1- H. Jiawei, K. Micheline and P. Jian, 2012, Data Mining: Concepts and Techniq Third Edition, Elsevier.

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2- Essential References.
1- Rajan Chattamvelli, 2016, Data Mining Methods, Second Edition, Alpha Science International Limited. 2- Sang Suh, 2012, Practical Applications of Data Mining, Jones & Bartlett. 3- Max Bramer, 2016, Principles of Data Mining, Third Edition, Springer.
3- Electronic Materials and Web Sites etc.
1- https://www.guru99.com/data-mining-tutorial.html 2- https://www.tutorialspoint.com/data_mining/index.htm 3- https://www.wisdomjobs.com/e-university/data-mining-tutorial-199.html

X. Course Policies:	
Unless otherwise stated, the normal course administration policies and rules of the Faculty of Computer and Information Technology apply. For the policy, see: ----- -- The University Regulations on academic misconduct will be strictly enforced. Please refer to ----- ----	
1	Class Attendance: A student should attend not less than 75 % of total hours of the subject; otherwise he will not be able to take the exam and will be considered as exam failure. If the student is absent due to illness, he/she should bring a proof statement from university Clinic
2	Tardy: For late in attending the class, the student will be initially notified. If he repeated lateness in attending class, he will be considered as absent.
3	Exam Attendance/Punctuality: A student should attend the exam on time. He is Permitted to attend an exam half one hour from exam beginning, after that he/she will not be permitted to take the exam and he/she will be considered as absent in exam.
4	Assignments & Project The assignment is given to the students after each chapter; the student has to submit all the assignments for checking on time.
5	Cheating:

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	For cheating in exam, a student will be considered as fail. In case the cheating is repeated three times during his/her study the student will be disengaged from the Faculty.
6	Plagiarism: Plagiarism is the attending of a student the exam of a course instead of another student. If the examination committee proofed a plagiarism of a student, he will be disengaged from the Faculty. The final disengagement of the student from the Faculty should be confirmed from the Student Council Affair of the university.
7	Other policies: <ul style="list-style-type: none"> - Mobile phones are not allowed to use during a class lecture. It must be closed, otherwise the student will be asked to leave the lecture room - Mobile phones are not allowed in class during the examination. - Lecture notes and assignments my given directly to students using soft or hard copy

اللجنة الإشرافية			
م.	الاسم	الصفة	التوقيع
١	أ.م.د. عبد الماجد الخليدي	نائب عميد الكلية للشؤون الأكاديمية	
٢	أ.م.د. احمد مجاهد	نائب عميد مركز التطوير الأكاديمي وضمان الجودة	
٣	د. حسين الأشول	ممثل المركز في الكلية	
٤	أ.د. إبراهيم المطاع	نائب رئيس الجامعة للشؤون الأكاديمية	

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