اعتماد
NCAAA

T4

2020

Course Specifications

Course Title:	Data Warehousing and Mining
Course Code:	CPIT440
Program:	Bachelor of Science in Information Technology
Department:	Information Technology
College:	Faculty of Computing and Information Technology
Institution:	Northern Border University, Rafha

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Table of Contents

A. Course Identification

1. Credit hours: 3	

2. Course type

a. University ☐ College ☐ Department **X** Others ☐

b. Required ☐ Elective **X**

3. Level/year at which this course is offered: - / -

4. Pre-requisites for this course (if any)**: CPIT340- Database II**

5. Co-requisites for this course (if any)**: Nil**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	60	100 %
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	45
2	**Laboratory/Studio**	15
3	**Tutorial**	
4	**Others** (specify)	
	Total	60

B. Course Objectives and Learning Outcomes

1. Course Description

This course familiarizes students with the different knowledge extraction methods and its representation techniques as well as knowledge engineering. It also introduces the different basic data warehouse and data mining theories that qualify the students to understand the contents of the course. Topics include Introduction to Data Mining and Warehousing, Data Preprocessing and Visualization, Data Warehousing and OLAP Technology, Cluster Analysis, Mining Frequent Patterns, Associations Rules.

2. Course Main Objective

After successful completion of this course, student will be able to identify the key processes of data mining, data warehousing and knowledge discovery process. Understand the basic principles and algorithms used in practical data mining and their strengths and weaknesses.

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding:**	
1.1	Recognize the Knowledge Discovery in Databases process and the different types of data.	K1
1.2	Outline the differences between data warehouse and operational database.	K1
1.3	Describe the OLAP operations to analyze data in a data cube.	K1
2	**Skills:**	
2.1	Apply preprocessing, visualization and integrating techniques to any kind of data.	S1, S3
2.2	Design a data warehouse schema using fact and dimension tables.	S2
2.3	Illustrate in real world problems some of the data mining techniques (clustering, association rules and decision trees).	S1, S3
3	**Values:**	

C. Course Content

No	List of Topics	Contact Hours
1	Introduction to Data Warehousing and Mining	6
2	Data	6
3	Data Preprocessing	3
4	Data Visualization	3
5	Data Warehousing and OLAP Technology	6
6	Multidimensional Databases and OLAP operators	3
7	Cluster Analysis	6
8	Association rules mining	6
9	Decision trees	6
Laboratory Works		
1	Talend Open Studio for Data Integration Overview	1
2	How to design a Job using Repository Metadata	2
3	Data Preprocessing with R Software	2
4	Data Visualization with R Software	2
5	Multidimensional Analysis with Mondrian	2
6	Cluster Analysis with R Software	2
7	Association rules	2
8	Decision trees	2
Total		60

D. Teaching and Assessment
1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		
1.1	Recognize the Knowledge Discovery in Databases process and the different types of data.	Class / Group discussion	Writing Oral

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.2	Outline the differences between data warehouse and operational database.	Class / Group discussion, KWLH (Know, Want, Learned, How) technique	Writing Oral
1.3	Describe the OLAP operations to analyze data in a data cube.	Class / Group discussion, KWLH (Know, Want, Learned, How) technique	Writing Oral
2.0	**Skills**		
2.1	Apply preprocessing, visualization and integrating techniques to any kind of data.	Academic Debate, Lab-Based Learning	Writing, Performance, Observation
2.2	Design a data warehouse schema using fact and dimension tables.	Academic Debate, Lab-Based Learning	Writing, Performance, Observation
2.3	Illustrate in real world problems some of the data mining techniques (clustering, association rules and decision trees).	Academic Debate, Lab-Based Learning	Writing, Performance, Observation
3.0	**Values**		

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quiz-1	2	2
2	Quiz-2	8	3
3	Assignment-1	4	5
4	Assignment-2	10	5
5	Oral questions	1-11	5
6	Lab tasks	1-11	16
7	Midterm exam	6	20
8	Lab exam	12	4
9	Final exam	13	40

*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice:

Every instructor has an announced office hours schedule. All students are encouraged to visit the concerned teacher according to the schedule. Students can also use Email address or Blackboard System to seek help or book an appointment.

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	1. Bhatia, P. (2019). *Data Mining and Data Warehousing: Principles and Practical Techniques* (1st ed.). Cambridge University Press. 2. Marakas, G. M. (2002), *Modern Data Warehousing, Mining, and Visualization: Core Concepts* (1st ed.). Prentice Hall.

Essential References Materials	1. Han, J. & Kamber, M. (2011). *Data Mining: Concepts and Techniques* (3rd ed.). Morgan Kaufmann. 2. King, E. (2000). *Data Warehousing and Data Mining: Implementing Strategic Knowledge Management* (1st ed.). Computer Technology Research Corporation.
Electronic Materials	1. Blackboard System: https://lms.nbu.edu.sa/ 2. Northern Border University Electronic Library: https://www.nbu.edu.sa/AR/Deanships/Library_Issues 3. Saudi Digital Library (SDL): https://portal.sdl.edu.sa/english/
Other Learning Materials	Nil

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	• Classroom • Laboratory
Technology Resources (AV, data show, Smart Board, software, etc.)	• Data Show (Projectors) in Classroom and Laboratory. • Desktop computers • OS: Windows 10 • Software: Talend Open Studio for Data Integration, R Software, Mondrian, Web Browser.
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	Nil

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching and assessment.	Students	Indirect
Quality of learning resources	Students	Indirect
Extent of achievement of course learning outcomes	Faculty	Direct

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	Information Technology Department Council
Reference No.	10
Date	27/02/2022