Course Specification

(Bachelor)

Course Title: **Introduction to Data Mining**	
Course Code: **CS1753**	
Program: **Computer Science**	
Department: **Computer Science**	
College: **College of Computer Science and Information Technology**	
Institution: **Albaha University**	
Version: **T-104-V1**	
Last Revision Date: **22/1/2023**	

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: (3 Credit Hours (3, 0, 0) (Lecture, Lab, Tutorial) (3 Contact Hours))

2. Course type

A.	☐University	☐College	☒ Department	☐Track	☐Others
B.	☐Required		☒ Elective		

3. Level/year at which this course is offered: (10TH Level/ 4TH Year)

4. Course general Description:

In this course, which focuses on pattern discovery, you will learn why pattern discovery is important, what the major tricks are for efficient pattern mining, and how to apply pattern discovery in some interesting applications. We are also focused on cluster analysis; you will learn concepts and methodologies for cluster analysis, which is also known as clustering, data segmentation, or unsupervised learning. We will introduce the basic concepts of cluster analysis and then study a set of typical clustering methodologies, algorithms, and applications. This includes partitioning methods, such ask-means, hierarchical methods, such as BIRCH, density-based methods, such as DB SCAN, and grid-based methods, such as CLIQUE. We will also discuss data mining algorithms (clustering, classification, association rules, and prediction).

5. Pre-requirements for this course (if any): CS1007

6. Pre-requirements for this course (if any): NONE

7. Course Main Objective(s):

The main objectives of this course are to describe Pattern Discovery Overview, Memorize Pattern Evaluation; mining diverse Frequent Patterns, Describe Sequential Pattern Mining, and Pattern Mining.

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	33	100%
2	E-learning		
3	Hybrid • Traditional classroom • E-learning		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	33
2.	**Laboratory/Studio**	
3.	**Field**	
4.	**Tutorial**	
5.	**Others (specify)**	
Total		33

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	Describe Pattern Discovery Overview	K1	Lectures Class discussion	***Direct Assessment Tool*** • Midterm Exam • Final Exam ***Indirect Assessment Tool*** Course Exit Survey
1.2	Memorize Pattern Evaluation; Pattern Mining Diverse Frequent Patterns	K2	Lectures Class discussion	***Direct Assessment Tool*** • Midterm Exam • Final Exam ***Indirect Assessment Tool*** Course Exit Survey

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.3	Describe data mining algorithms	K3	Lectures Class discussion	*Direct Assessment Tool* • Midterm Exam • Final Exam *Indirect Assessment Tool* Course Exit Survey
2.0	**Skills**			
2.1		S1	Lectures Class discussion	Homework Midterm Quizzes Final exam
2.2		S2	Lectures Class discussion	Homework Midterm Quizzes Final exam
2.3		S3	Lectures Class discussion	Homework Midterm Quizzes Final exam
3.0	**Values, autonomy, and responsibility**			
3.1		V1	Small Groups	-Homework
...				

C. Course Content

No	List of Topics	Contact Hours
1.	An Introduction to the Data Mining. A Multi-Dimensional View of Data Mining, What Kind of Data, Pattern Can Be Mined. Major Issues in Data Mining	6
2.	Getting to Know your Data. Data Objects and Attribute Types. Basic Statistical Descriptions of Data. Data Visualization. Measuring Data Similarity and Dissimilarity	6
3.	Data Preprocessing: An Overview. Data Quality. Major Tasks in Data Preprocessing Data Cleaning. Data Integration; Data Reduction; Data Transformation and Data Discretization	6
4.	Clustering	3
5.	Association rules	3
6.	Classification	3
7.	Prediction	3
8.	Advanced techniques, Data Mining software and applications	3
Total		**33**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Homework exercises and/or programming assignments	5-7	15%
2.	Midterm	6	20%
3.	Quiz	9	15%
4.	Final Exam	11	50%

*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	1. Han,J., Kamber, M.,&Pei,J.(2011).Data mining: Conceptsand techniques(3rd ed.). Waltham: Morgan Kaufmann. **2.** Pang-NingTan**,** Michael Steinbach**,** Anuj Karpatne**,** VipinKumar**,** Introduction to Data Mining (Second Edition).Paperback– International Edition, 2005.
Supportive References	ComputerScienceCurriculum2013–http://cs2013.org ACM (Association for Computer Machinery) Curricula Recommendations- http://www.acm.org/education/curricula-recommendations
Electronic Materials	Access to the Saudi Digital Library(SDL). Using the learning management system of the university–Rafid System (https://lms.bu.edu.sa/). ACM (Association for Computer Machinery) web site -http://www.acm.org/ ACMSIGART(Special Interest Group on Computer Architecture)-http://www.sigarch.org/ IEEE Computer Society web site - http://www.computer.org/portal/web/guest/home Open access course material online
Other Learning Materials	Writing a case study: http://college.cengage.com/business/resources/casestudies/students/writing.htm http://www.asb.unsw.edu.au/learningandteaching/Documents/writingacaseanalysis.pdf

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	A classroom or lecture hall with white board for 25 students
Technology equipment (projector, smart board, software)	A digital image projection system with connection to desktop computer and laptop computer. High-speed Internet connection. An instructor computer station.
Other equipment (depending on the nature of the specialty)	None

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	• Students • Faculty • Peer Reviewers • Program Leader • Course Coordinator	• Surveys(indirect). • Direct feedback fromstudents. • Course evaluation byPeer Reviewers(indirect). • Class visit by Program Leader(indirect) • Comprehensive Course report (where we can find information about teachingdifficulties and action plan, …)
Effectiveness of Students assessment	• Students • Faculty • Peer Reviewers • Program Leader • Exam Evaluation Committee • Course Coordinator	• Surveys(indirect). • Direct feedback fromstudents. • Course evaluation byPeer Reviewers(indirect). • Class visit by Program Leader(indirect) Exam evaluation by theExam Evaluation Committee (indirect)
Quality of learning resources	• Faculty • Program Leader • Course Coordinator	• Student Results(direct) Comprehensive Course report(where we can find the CLO assessment results)

Assessment Areas/Issues	Assessor	Assessment Methods
The extent to which CLOs have been achieved	•Students •Faculty •Peer Reviewers •Course Coordinator	•Surveys(indirect) •Course evaluation by Peer Reviewers(indirect). •Comprehensive Course repot •(where we can find information about difficulties and challenges about learning resources as well as Consequences and action plan,...)
Other		

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	CURRICULUM COMMITTEE MEETING
REFERENCE NO.	
DATE	MARCH 29, 2023