Future Academy
Higher Future Institute for Specialized Technological Studies

Course Specification

1- Course information:

Course Code:	CSC466
Course Title:	Data Mining
Year/level	4th
Academic Programs	Computer Science Program (B.Sc.)
Contact hours/ week	(Theoretical=2hrs), Practical=2hrs), Total=4 hrs

2- Course aims:

This course aims to provide students with

- Understand data mining as a set of analysing concepts and techniques within different applications.
- Build the required knowledge in many recent areas like fuzzy algorithms, rough sets, genetic algorithms, and neural networks.
- Implement and elaborate different mining algorithms to get the required skills.
- Be an effective member of teamwork through the assigned projects and assignments

3- Intended learning outcomes of the course (ILOs):

a- Knowledge and understanding:

On successful completion of this course, the student should be able to:

a1- Define the data mining process as a KDD
a2- State the need and scope of technical indicators for data mining
a3- List Machine Learning techniques
a4- Recognize Data mining tools in different context

b- Intellectual skills:

On completing this course, the student should be able to:

b1- Review large datasets.
b2- Discuss Data mining techniques for supporting user decision.
b3- Select suitable Data mining techniques regarding the context.

c- Professional and practical skills:

At the end of this course, the student will be able to:

c1- Examine large data sets using suitable tools.

c2- Apply knowledge extraction approach based on Data Mining techniques.
c3- Test performance of Data Mining techniques in different context.

d- General and transferable skills:

On successful completion of this course, the student should be able to:

d1- Work effectively in a team.

4- Course contents

Topics/units	Number of hours		ILO's
	Lecture hours	Practical hours	
What is Data Mining? What Motivated Data Mining?	2	2	a1, a2, b1, b2, c1
Mining frequent itemsets: Association rules I	2	2	a1, a3, a4, b1, b2, c1
Association rules II FPGROWTH Algorithm	2	2	a1, a3, a4, b1, b2, c1
Association rules III ECLAT Algorithm	2	2	a1, a3, a4, b1, b2, c1
Clustering I	2	2	a3, a4, b2, c1, c2
Clustering II	2	2	a3, a4, b2, c1, c2
Clustering III	2	2	a3, a4, b2, c1, c2
Data Preprocessing I: Outlier Detection	2	2	a3, a4, b2, c1, c2
Data Preprocessing II: Normalization and Standardization	2	2	a3, a4, b3, c3
Classification and Prediction I	2	2	a3, a4, b3, c3
Classification and Prediction II	2	2	a3, a4, b2, c1, c2, d1
Classification and Prediction III	2	2	a3, a4, b2, c1, c2, d1

5- Teaching and learning methods

Methods	ILO's										
	a1	a2	a3	a4	b1	b2	b3	c1	c2	c3	d1
Lectures	√	√	√	√	√	√	√				
Training visits											
Practical sections	√	√	√	√	√	√	√	√	√	√	√
Self-learning											
Summer training											
Assays and reviews											
Discussion groups											
Brainstorming											
Blended-learning											

E-learning											

6- Teaching and learning methods for Low-achieving students

- Extra teaching hours for those who need help
- More quizzes to assess their ability for understanding the course
- Encourage the teamwork for those students with other advanced ones to increase their participation and understanding.
- Use of non-simultaneous hybrid e-learning:(Videos, presentations or PDF files uploaded on the Institute's educational platform).

7- Student assessment

Assessment method	Time	Grade weight (%)	ILOs
Written exam	2 Hours	60%	a1, a2, a3, a4, b1, b2, b3
Practical exam	45 Minutes	15%	a1, a2, a3, a4, b1, b2, b3, c1, c2, c3, d1
Oral exam	-	-	-
Mid-term exam	45 Minutes	10%	a1, a2, a3, a4, b1, b2, b3
Participations	-	5%	a1, a2, b2, b3
Quizzes	20 Minutes for each	10%	a1, a2, a3, a4, b1, b2, b3

8-List of references

8.1. Student notebooks:

- Comprehensive instructor notes (“PowerPoint slides”) are available on the course web page (“Google Classroom”).

8.2. Essential textbooks:

- Data Mining: Concepts and Techniques, 3rd ed. The Morgan Kaufmann Series in Data Management Systems, Jim Gray, Series Editor Morgan Kaufmann Publishers, United States, March 2012. ISBN 1-55860-901-6.
- Gareth James, et al., “An Introduction to Statistical Learning with Applications in R”, Springer.

8.3. Recommended textbooks:

- Data Mining: Concepts and Techniques, 3rd ed. The Morgan Kaufmann Series in Data Management Systems, Jim Gray, Series Editor Morgan Kaufmann Publishers, United States, March 2012. ISBN 1-55860-901-6.

8.4. Journals, Periodical and Reports ……..etc.

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