

MS4224: ENTERPRISE DATA MINING

Effective Term

Semester A 2024/25

Part I Course Overview

Course Title

Enterprise Data Mining

Subject Code

MS - Management Sciences

Course Number

4224

Academic Unit

Management Sciences (MS)

College/School

College of Business (CB)

Course Duration

One Semester

Credit Units

3

Level

B1, B2, B3, B4 - Bachelor's Degree

Medium of Instruction

English

Medium of Assessment

English

Prerequisites

MS3252 Regression Analysis

Precursors

CB2200 Business Statistics or equivalent
MS3251 Analytics Using SAS or equivalent

Equivalent Courses

Nil

Exclusive Courses

MS4424 Data Mining and Modelling

Part II Course Details

Abstract

This course aims to :

- Provide fundamental concepts and techniques of using data mining in the context of business applications
- Develop students' analytical ability to identify, formalize and solve the real world problem with business intelligence
- Prepare students for a position in managing business activities for data modelling in the commercial and government sectors in both local and global environment

Course Intended Learning Outcomes (CILOs)

CILOs		Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Discuss the history, nature role and relevant concepts of data mining.	10		x	
2	Evaluate a wide range of emerging and newly-adopted methodologies and technologies to facilitate the knowledge discovery.	40		x	x
3	Critically discuss the pros and cons of various processes, methodologies in knowledge discovery.	20		x	
4	Master the SAS Enterprise Miner software to perform data mining tasks	30	x	x	x

A1: Attitude

Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

A2: Ability

Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to real-life problems.

A3: Accomplishments

Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

Teaching and Learning Activities (TLAs)

TLAs	Brief Description	CILO No.	Hours/week (if applicable)
1	Lecture	Concepts and knowledge of Data mining are explained	1, 2, 3
2	Tutorial	How to master SAS Enterprise Miner software are demonstrated. Students apply the learned concepts, techniques and SAS Enterpriser Miner skills on exercise questions	1, 2, 3, 4

Assessment Tasks / Activities (ATs)

ATs	CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1 Mid-term Test The test will assess the students' basic understanding of the material learnt in the first half of the course.	1, 2, 3	20	
2 Group Project Students will work in groups; prepare on selected topics; students are required to formulate a problem and apply relevant data mining tools.	1, 2, 3, 4	20	
3 Individual presentation and Q&A Students will deliver presentations on selected topics; Students are required to answer the data mining questions during the Q&A session	1, 2, 3, 4	20	

Continuous Assessment (%)

60

Examination (%)

40

Examination Duration (Hours)

3

Additional Information for ATs

Written Examination

The exam will assess the students' understanding of the material learnt in the course and their ability to apply subject related knowledge.

Assessment Rubrics (AR)**Assessment Task**

Mid-term Test

Criterion

1.1 ABILITY to EXPLAIN the key concepts and fundamental knowledge of data mining

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Not even reaching marginal levels

Assessment Task

Group project

Criterion

2.1 CAPACITY for COLLABORATING with students to carry out problem-based activities based on real world problems.

2.2 ABILITY to EXPLAIN in DETAIL and with ACCURACY methods in analysing the relationship between business and sustainability solutions.

2.3 CAPACITY for SELF-DIRECTED LEARNING to find solutions to the problems and make recommendations for implementing the solutions

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Not even reaching marginal levels

Assessment Task

Individual presentation and Q&A

Criterion

3.1 ABILITY to UNDERSTAND the knowledge of big data and social network analysis

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Not even reaching marginal levels

Assessment Task

Examination

Criterion

4.1 ABILITY to EXPLAIN the key concepts and fundamental knowledge of data mining

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Not even reaching marginal levels

Part III Other Information

Keyword Syllabus

Data Preparation for Analysis

Summary Statistics; Data Visualization; OLAP and Multidimensional Data Analysis; Data Warehouse; Star Schema; Analysis Subject; Single view of the customer; Subject-oriented data; Data preparation for data mining; Dimension reduction; Integrity of data; Statistical ethics; Responsibilities to data; Potential misconduct;

Concepts of Data mining - SEMMA processes of Data mining; Supervised and unsupervised Statistical Learning;

Predictive Modelling - Logistic Regression; Decision Tree; Artificial Intelligence; Neural Network; Ordinal and Multinomial Logit Model; Tree-based Regression model; Learning Algorithm;

Pattern Recognition/Customer Behaviour Recognition - Similarity Measures; Clustering Analysis, RFM Analysis; Bayesian statistics, Association Analysis; Market Basket Analysis; Apriori Algorithm; Multi-level association rules; Sequential Pattern Mining;

Model validation - Goodness of fit; Model tuning; Model assessment and implementation

Business Analytics/Intelligence - Knowledge Discovery, Credit Scoring, Credit model development; Reject Inference;

Reading List

Compulsory Readings

	Title
1	Tan, P.N., Steinbach, M. and Kumar, V., Introduction to Data Mining. Pearson, 2014.
2	Thomas, L., Crook, J. and Edelman, D., Credit Scoring and its Applications, Second Edition, 2017. SIAM
3	Forster Provost and Tom Fawcett, 2013. Data Science for Business. O’ Reilly Media, Inc.

Additional Readings

	Title
1	Paolo Giudici, Applied Data Mining: Statistical Methods for Business and Industry, John Wiley & Sons, 2003
2	Matignon, Randall. Data Mining Using SAS Enterprise Miner. Second Edition. Wiley, 2007
3	Cerrito, Patricia, Introduction to Data Mining Using SAS Enterprise Miner. SAS Institute, 2007
4	Michael Berry, & Gordon Linoff, Data mining techniques: For marketing, sales, and customer support, John Wiley & Sons, 2004
5	Patricia B. Cerrito, Introduction to Data Mining Using SAS Enterprise Miner, SAS Institute, 2006.
6	Michael Berry, & Gordon Linoff, Mastering Data Mining, John Wiley & Sons, 2000. Jiawei Han, & Micheline Kamber, Data mining: Concepts and techniques, Morgan Kaufmann Pub., 2000
7	Bart Baesens, Analytics in a BIG DATA WORLD – The essential guide to data science and its applications. WILEY, 2014
8	Bart Baesens, Credit Risk Modeling Using SAS, SAS Institute, 2011