2024 / 25

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South East Technological University

Module Descriptor

Data Mining 1
(Computing and Mathematics)

Data Mining 1 (A29441)

Short Title: Data Mining 1
Department: Computing and Mathematics
Credits: 5 **Level:** Advanced

Description of Module / Aims

The purpose of this module is to introduce the student to the fundamental concepts and techniques of Data Mining. The student will become familiar with Data Mining approaches (such as prediction, classification, clustering) and their typical solution techniques (methods and algorithms) to datasets that support business intelligence applications. The practical part of the module will present a suite of Data Mining exercises that the student will solve. During each exercise, the student will apply an appropriate Data Mining method and learn to evaluate and interpret the results.

Programmes

		stage/semester/status
COMP-0563	BSc (Hons) in Applied Computing (International) (WD_KACCM_BI)	4 / 7 / M
COMP-0563	BSc (Hons) in Applied Computing (WD_KACCM_B)	4 / 7 / M
COMP-0563	BSc (Hons) in Applied Computing (WD_KCOMP_B)	4 / 7 / M
COMP-0563	BSc (Hons) in Computer Forensics and Security (WD_KCOFO_B)	4 / 7 / M
COMP-0563	BSc (Hons) in Computer Science (WD_KCMSC_B)	4 / 7 / M
COMP-0563	BSc (Hons) in Physics for Modern Technology (WD_KPHTE_B)	4 / 7 / E
COMP-0563	BSc (Hons) in the Internet of Things (International) (WD_KINTT_BI)	4 / 7 / M

Indicative Content

- Introduction to Data Mining: frameworks, inputs, outputs
- Exploratory Data Mining: relationships, clustering and network analysis using appropriate algorithms and methods
- Predicting outcomes: classification, regression and time-series analysis

Learning Outcomes

On successful completion of this module, a student will be able to:

1. Categorise typical fundamental Data Mining problems.
2. Appraise the concepts and fundamentals of Classification, Prediction and Clustering and their solution techniques.
3. Evaluate the use of typical Data Mining methods and their appropriate implementation.
4. Solve Data Mining problems using the Data Mining methods learnt.
5. Assemble and interpret results of the Data Mining methods learnt.

Learning and Teaching Methods

- The lectures will introduce the theory content to the student. The student will be encouraged to participate in class discussions and ask questions to support their learning process.
- The practical classes facilitate the student in implementing the theory learned in the lectures.
- Students will apply typical methods of Data Mining to data sets provided in the practical classes.
- Students will apply appropriate Data Mining methods to a data set for the purposes of continuous assessment.
- Students will interpret and present the findings produced in the practical classes and continuous assessment.

Learning Modes

Learning Type	F/T Hours	P/T Hours
Lecture	36	
Practical	12	
Independent Learning	87	

Assessment Methods

	Weighting	Outcomes Assessed
Continuous Assessment	100%	
Assignment	25%	1,2,3
Assignment	25%	3,4
Assignment	50%	1,5

Assessment Criteria

<40%: Unable to interpret and describe key concepts of data mining approaches.

40%–49%: Be able to interpret and describe key concepts of data mining approaches.

50%–59%: Ability to discuss key concepts of data mining approaches and ability to discover and integrate related knowledge in other knowledge domains.

60%–69%: Be able to solve problems using data mining techniques by experimenting with the appropriate skills and tools.

70%–100%: All the above to an excellent level. Be able to analyse and design solutions to a high standard for a range of both complex and unforeseen problems through the use and modification of appropriate skills and tools.

Supplementary Material(s)

- Han, Jiawei, Micheline Kamber and Jian Pei. *...Data Mining, Third Edition: Concepts and Techniques.* NY: Jian Pe, 2011.
- James, G., D. Witten, T. Hastie and R. Tibshirani. *An Introduction to Statistical Learning, with Applications in R.* NY: Springer, 2013.
- Pang-Ning, Tan, Michael Steinbach and Vipin Kumar. *Introduction to Data Mining.* NY: Addison-Wesley, 2006.
- Witten, I., E. Frank and M. Hall. *Practical Machine Learning Tools and Techniques.* NY: Elsevier, 2011.

Requested Resources

- Room Type: Computer Lab