Course Title:	**Data Mining and Knowledge Engineering**
Course Code:	**COMP723**
Descriptor Start Date:	**31/01/2025**

POINTS:	**15.00**
LEVEL:	**7**
PREREQUISITE/S:	**None**
COREQUISITE/S:	**None**
RESTRICTION/S:	**None**

LEARNING HOURS

Hours may include lectures, tutorials, online forums, laboratories. Refer to your timetable and course information in Canvas for detailed information.

Total learning hours: 150

PRESCRIPTOR

Introduces students to the exciting world of Data Mining. Organisations have, over time, accumulated vast amounts of valuable data which, when exploited appropriately will give them a significant competitive advantage over their rivals who merely "crunch" data. Data Mining is an area that has come of age - well proven techniques and tools are widely available. Covers popular mining techniques as well as providing specific hands-on experience using a publicly available tool.

LEARNING OUTCOMES

1. Appreciate the role that Data Mining plays in enhancing the decision making process
2. Understand the fundamental concepts that underpin all Mining schemes, namely, Entropy, Classification, Association and Clustering
3. Understand the technical issues involved in extracting useful and interesting patters from large data sets.
4. Conceptualise the entire Mining life cycle from: Problem Definition through to Mining, Validation, Deployment and back.
5. Evaluate and compare different Mining schemes for solving a given problem.
6. Gain hands on experience on a popular machine learning workbench in solving real world Data Mining problems.

CONTENT

The course is in three main blocks, covering Basic Principles of Mining, Supervised Systems and Unsupervised Systems.

-Basic Principles of Mining
Knowledge Discovery Framework
Modes of Learning
Training of Classifiers
Data Pre-processing

-Supervised Learning Systems
Bayesian Classifies
Nearest Neighbour Systems
Decision Trees
Neural Networks
Metrics for evaluating classifiers and numeric prediction

-Unsupervised Learning Systems
Association Rule Mining
Clustering Algorithms
Metrics for evaluation of Association Rules and Clustering

LEARNING & TEACHING STRATEGIES

- Lectures
- Practical work including NCBI databases, Gene Expression, MATLAB, NeuCom modelling and discovery environment
- Assignments
- Individual and Group Case Studies
- Research Projects
- Student-led seminars
- Class discussion and debate
- Laboratory sessions
- Guest speakers
- Online learning modes

ASSESSMENT PLAN

Assessment Event	Weighting %	Learning Outcomes
Weekly Exercise	10.00	1,3
Test	40.00	1,2,3,6
Assignment	50.00	1,3,4,5

Grade Map	MAP1
	A+ A A- Pass with Distinction B+ B B- Pass with Merit C+ C C- Pass D Fail

Disclaimer: Course descriptors may be amended between teaching periods/semesters

Overall requirement/s to pass the course:

To pass this course, students must achieve a minimum overall grade of C-.

LEARNING RESOURCES

A recommended reading list will be provided.

For further information, contact: Te Ara Auaha - Faculty of Design & Creative Technologies

Principal Programme:	**AK3697, Bachelor of Computer and Information Sciences**
Related Programme/s:	**AK3751** **AK3698** **AK1041** **AK3001** **AK3003** **AK3756** **AK3706**