Course Title:	**Data Engineering and AI**
Course Code:	**ENGE707**
Descriptor Start Date:	**01/01/2026**
POINTS:	**15.00**
LEVEL:	**7**
PREREQUISITE/S:	**COMP500**
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 the application and theory of data driven methods in electrical and software engineering. Students learn how to build systems to extract useable information from analysing big data sets. Presents example applications of data engineering, introduces the terminology and states the problems to be solved. A review of methods covers data collection, handling, storage, and visualisation, issues relating to big data, and methods of machine learning and artificial intelligence is included.

LEARNING OUTCOMES

1. 1. Elicit requirements for a data engineering project (a, b, d, f, g, i)
2. 2. Handle and visualise data appropriately for an application (a, b, c, d, e)
3. 3. Select and describe machine learning/AI algorithms appropriate for an application (a, b, d, e, i)
4. 4. Apply a machine learning algorithm from a toolbox/API (a, b, c, d, e)
5. 5. Judge the validity of the results (b, f, g, i)

CONTENT

- Overview of problem types addressed by data engineering and artificial intelligence
- Taxonomy of data engineering, machine learning and artificial intelligence methods
- Fundamental Python programming, handling of CSV files and the numpy library
- Data structures for handling data (series, tables) in Python
- Data preparation, cleanup, data augmentation
- Basic inferential statistics using Python
- Histograms, probability density function
- Classification using Bayes' theorem and Fisher's linear discriminant analysis
- Python libaries for machine learning/artificial intelligence
- Measuring the validity of machine learning results (overfitting, training/test sets, cross-validation)
- Review of legal, ethical and social issues

Key to Graduate Capabilities Profile:
a. Engineering knowledge
b. Problem analysis
c. Design/development of solutions
d. Investigation
e. Tool usage
f. The engineer and the world
g. Ethics
h. Individual and collaborative team-work
i. Communication
j. Project management and finance
k. Lifelong learning

LEARNING & TEACHING STRATEGIES

A range of teaching and learning strategies may include lectures, tutorials case studies, computer simulations, and online learning.

ASSESSMENT PLAN

Assessment Event	Weighting %	Learning Outcomes
Scoping Document	30.00	1-5
Group Project	30.00	1-3
Machine Learning Assignment	40.00	1-5

Grade Map **MAP1**

A+ A A- Pass with Distinction
B+ B B- Pass with Merit
C+ C C- Pass
D Fail

Overall requirement/s to pass the course:

To pass this course, students must attempt all summative assessments and achieve a minimum overall grade of C-.

LEARNING RESOURCES

A recommended reading list will be supplied.

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

Principal Programme:	**AK3751, Bachelor of Engineering (Honours)**
Related Programme/s:	**AK3719**