Course Title:	**Software Engineering Maths**
Course Code:	**ENSE704**
Descriptor Start Date:	**28/02/2025**
POINTS:	**15.00**
LEVEL:	**7**
PREREQUISITE/S:	**COMP500, ENGE501**
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 mathematical basics of advanced topics in software engineering including cryptography, application development for data sciences and artificial intelligence, and the use of formal methods.

LEARNING OUTCOMES

1. Discuss how number theory, logic, statistics and graph theory relate to software engineering (a, d, i)
2. Analyse application problems to generate mathematically abstract models and algorithms related to number theory and discrete mathematics (a, b, c)
3. Demonstrate knowledge and problem solving skills related to propositional and predicate logic inference in the area of software engineering (a, b, c)
4. Estimate, question and interpret probability distributions and automated decisions based on available data (a, b, e)

CONTENT

• Algebraic foundations of cryptography: Number theory concepts about groups, rings, and fields, in particular modulo multiplication and addition involving integers and polynomials

• Foundations of mathematical logic, propositional Logic, methods of proving theorems

• Mathematical foundations of data science: Random variables, probability distribution and histograms, Bayes' theorem

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
Logic and Cryptography Assignment	30.00	2,3
Data Science Assignment	30.00	4
Project Report	40.00	1-4

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:	**ICE1** **INEXCH1** **SABRD1**

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