

MATH 1040 ENGINEERING MATHEMATICS AND COMPUTING (WSTC)

Credit Points 10

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Description The subject aims to equip you with fundamental skills in calculus and computer programming as essential tools for problem-solving and data analysis in engineering. You will be introduced to basic calculus (differentiation and integration) and their common applications in engineering. The subject will also introduce you to computer programming and other technology tools for calculation and data analysis and visualisation. This subject will also include extensive practical work and problem-solving activities focusing on algorithmic approach to problem-solving. You will be able to apply the acquired skills and knowledge in various engineering subjects as well as in your future careers.

School Eng, Design & Built Env

Discipline Mathematics

Student Contribution Band HECS Band 1 10cp

Check your fees via the Fees (https://www.westernsydney.edu.au/currentstudents/current_students/fees/) page.

Level Undergraduate Level 1 subject

Restrictions

Students must be enrolled in an existing Destination College Diploma program listed below:

- 7188 Diploma in Culture, Society and Justice
- 7189 Diploma in Health Science
- 7190 Diploma in Business
- 7191 Diploma in Information and Communication Technologies
- 7192 Diploma in Building Design and Construction
- 7193 Diploma in Engineering Studies
- 7194 Diploma in Creative Industries and Communications
- 7195 Diploma in Arts
- 7196 Diploma in Science
- 7197 Diploma in Education Studies

Learning Outcomes

After successful completion of this subject, students will be able to:

1. Use functions to describe and model quantities in engineering.
2. Use differential calculus to study how various engineering quantities change.
3. Use integral calculus to calculate various quantities based on their density functions.
4. Apply basic programming control structures including sequence, selection, and iteration to create computer programs based on algorithmic solutions.
5. Use mathematical skills and logical thinking to solve and communicate challenging and complex problems where solution is not immediately obvious.

Subject Content

- Functions (definition and basic properties, graphs, elementary functions)
- Introduction to a programming environment for numerical computing and data analysis (simple calculations and graphs in programming environment for numerical computing and data analysis)
- Algorithmic approach to problem-solving
- Differentiation (definition and applications, calculating derivatives in a programming environment for numerical computing and data analysis)
- Integration (fundamental theorem of calculus; applications of integration, integration with a programming environment for numerical computing and data analysis)
- Using loops, selection and repetition structures in a programming environment for numerical computing and data analysis to solve problems and analyse data

Assessment

The following table summarises the standard assessment tasks for this subject. Please note this is a guide only. Assessment tasks are regularly updated, where there is a difference your Learning Guide takes precedence.

| Type | Length | Percent | Threshold | Individual/ Group Task | Mandatory |
|---------------------------|--------------------------|---------|-----------|------------------------|-----------|
| Numerical Problem Solving | 1 hour | 20 | N | Individual | N |
| Professional Task | 1000 words or equivalent | 30 | N | Individual | N |
| Applied Project | 700 words or equivalent | 20 | N | Individual | N |
| Presentation | 10 minutes | 30 | N | Individual | N |

Teaching Periods

Spring Block 1 (2025) Penrith (Kingswood)

On-site

Subject Contact Abbas Ranjbar (<https://directory.westernsydney.edu.au/search/name/Abbas.Ranjbar/>)

View timetable (https://classregistration.westernsydney.edu.au/odd/timetable/?subject_code=MATH1040_25-SB1_KW_1#subjects)