MATH 1018 MATHEMATICS FOR ENGINEERS 1 (WSTC)

Credit Points 10

Legacy Code 700019

Coordinator Abbas Ranjbar (https://directory.westernsydney.edu.au/search/name/Abbas Ranjbar/)

Description The content of this subject covers a number of topics that underpin the later-stage engineering mathematics subjects. The subject matter includes: differential and integral calculus of a single variable, complex numbers, aspects of matrix algebra, vectors and some elementary statistics and probability theory.

School Computer, Data & Math Sciences

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

Pre-requisite(s) MATH 1023

Equivalent Subjects MATH 1017 - Mathematics for Engineers 1 (WSTC Assoc Deg)

Incompatible Subjects MATH 1014 - Mathematics 1A MATH 1015 - Mathematics 1B MATH 1011 - Fundamentals of Mathematics

Restrictions

Students must be enrolled at Western Sydney University, The College unless specific permission has been granted by the School of Computing, Engineering and Mathematics. Students enrolled in Extended Diplomas must pass 40 credit points from the preparatory subjects listed in the program structure prior to enrolling in this University level subject. Students enrolled in the combined Diploma/Bachelor programs listed below must pass all College Preparatory subjects listed in the program structure before progressing to the Year 2 subjects.

Learning Outcomes

On successful completion of this subject, students should be able to:

1. Solve problems involving matrices and determinants
2. Define j2 and operate with complex numbers
3. Perform operations on vectors, both in 2-D and 3-D
4. Find solutions to problems involving logarithmic, exponential, inverse trigonometric, hyperbolic and inverse hyperbolic functions
5. Apply correctly the techniques of both differential and integral calculus to solve problems that may involve transcendental functions
6. Define a random variable and find its probability distribution and calculate probabilities based on the Binomial distribution, the Poisson distribution and the Normal distribution
7. Appreciate the relevance of mathematics in an engineering context
8. Communicate mathematical ideas using common conventions

Subject Content

1. Matrix Algebra: Determinants; matrices; solution of simultaneous equations using matrices and determinants; Gaussian elimination; eigenvalues and eigenvectors.
2. Complex Numbers: Basic operations; polar coordinates; Euler?fs formula; powers and roots of complex numbers.
3. Vectors: definition; basic operations; dot product; cross product; angle between two vectors; equations of lines and planes.
4. Functions and Inverse Functions: Revision - inverse functions, logs, exponentials; trig and inverse trig functions; hyperbolic and inverse hyperbolic functions.
5. Differential Calculus: Revision- limits; continuity; definition of the first derivative, differentiation rules; implicit differentiation including inverse trig functions and inverse hyperbolic functions.
6. Applications of Differential Calculus: L?fHopital?fs Rule; properties of curves; differentials; related rates.
7. Integration: Indefinite/defin

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	40 minutes	10	N	Individual	N
Numerical Problem Solving	1 hour	20	N	Individual	N
Numerical Problem Solving	1 hour	20	N	Individual	N
End-of-session Exam	2 hours	50	Y	Individual	Y

Prescribed Texts

- Croft, A & Davison, R (2008) Mathematics for engineers: a modern interactive approach (3rd ed). Harlow: Pearson Prentice Hall, Harlow UK

Teaching Periods

Term 1 (2025)

Penrith (Kingswood)

On-site

Subject Contact Zdenka Misanovic (https://directory.westernsydney.edu.au/search/name/Zdenka Misanovic/)

View timetable (https://classregistration.westernsydney.edu.au/odd/timetable/?subject_code=MATH1018_25-T1_KW_1#subjects)

Term 3 (2025)

Penrith (Kingswood)

On-site

Subject Contact Zdenka Misanovic (https://directory.westernsydney.edu.au/search/name/Zdenka Misanovic/)

View timetable (https://classregistration.westernsydney.edu.au/odd/timetable/?subject_code=MATH1018_25-T3_KW_1#subjects)