MATH 1023 MATHEMATICS FOR ENGINEERS PRELIMINARY (WSTC)

Credit Points 10

Legacy Code 700100

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

Description This subject covers the fundamental mathematical concepts and techniques necessary for the study of Engineering. Topics include Arithmetic and Algebra, Trigonometry, Functions, and Introductory Differential and Integral calculus.

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

Pre-requisite(s) Students enrolled in 6033 Diploma in EngineeringBachelor of Engineering Studies 7034 Diploma in Engineering or 7162 Diploma in Engineering Extended must pass MATH 0008 Mathematics 2 (WSTC Prep) before enrolling in this unit Students enrolled in 7066 Diploma in Engineering Extended must pass MATH 0010 Mathematics 3 (WSTC Prep) before enrolling in this unit

Equivalent Subjects MATH 1022 - Mathematics for Engineers Preliminary (WSTC Assoc Deg)

Incompatible Subjects MATH 1011 - Fundamentals of Mathematics

Restrictions

Students must be enrolled at Western Sydney University, The College. 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. Perform arithmetic operations and manipulate algebraic symbols as required in solving mathematical problems set in an engineering context.
2. Solve mathematical problems using trigonometry, logarithmic and exponential functions.
3. Apply correctly the techniques of both differential and integral calculus to solve problems that may involve transcendental functions.
4. Communicate mathematical ideas using standard practices.

Subject Content

1. Arithmetic and Algebra: Rational and irrational numbers, indices, manipulation of algebraic expressions, factorisation, linear equations and quadratic expressions, simultaneous equations.
2. Relations and Functions: Domain and range, linear functions, quadratic functions, roots of quadratic equations.
3. Logarithmic and Exponential Functions: Definition and properties of exponentials, graphing exponentials, differentiation and integration of exponentials, exponential growth and decay. Definition and properties of logarithms, graphing logarithms, differentiation and integration of logarithms.
4. Trigonometry: Trigonometric ratios, exact ratios, Sine and Cosine rules, reciprocal ratios, angles of any magnitude.
5. Trigonometric Functions: Radian measure, graphing, properties of functions, differentiation, integration.
6. Further Trigonometric Functions: Applied trigonometry, sums and differences of angles, equation solving, general solutions to trigonometric equations.
7. Inverse Functions and Inverse Trigonometric Functions: y'logax and y'ax as inverse functions, inverse trigonometric functions, differentiation and integration of inverse functions.
8. Differentiation: Limits and continuity.
9. the derivative from first principles; differentiation formulae; implicit differentiation, tangents and normals to curves, stationary points, higher order derivatives, curve sketching, problems involving maxima and minima, differentiation of trigonometric functions, logarithmic and exponential functions, and inverse trigonometric functions
10. Integration: Primitive functions, definite integrals, areas between curves; integration of trigonometric functions, logarithmic and exponential functions, and inverse trigonometric functions.

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	50 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 (3rd ed). Harlow: Pearson Prentice Hall, Harlow UK

Teaching Periods

Term 2 (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=MATH1023_25-T2_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=MATH1023_25-T3_KW_1#subjects)