MATH 1020 MATHEMATICS FOR ENGINEERS 2 (WSTC ASSOCD)

Credit Points 10

Legacy Code 700102

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

Description The content of this subject covers a number of topics that build on the student's calculus knowledge from Mathematics for Engineers 1. The subject matter includes: ordinary differential equations, Laplace transforms and multi-variable calculus.Offerings of alternate subjects are dependent on there being sufficient student enrolment numbers. If enrolments are low, the College may cancel delivery of the alternate subject.

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) MATH 1017

Equivalent Subjects MATH 1019 - Mathematics for Engineers 2 LGYB 0454 - Mathematics for Engineers 2 (WSTC)

Restrictions

Students must be enrolled at Western Sydney University, The College in 7022 Associate Degree in Engineering

Learning Outcomes

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

1. Recognise and solve various types of first and second order differential equations and some higher order ordinary differential equations.
2. Set up a linear 2D system of differential equations and investigate its solution and the nature of its critical points.
3. Apply Laplace transforms in solving problems.
4. Use multivariable calculus techniques competently.
5. Evaluate multiple (double and triple) integrals.
6. Use mathematical reasoning to solve problems and communicate mathematical ideas using standard practices.

Subject Content

1. First Order Ordinary Differential Equations (O.D.E.) – separable and linear equations and applications
2. Second Order Linear ODEs.– both homogeneous and non-homogeneous with constant coefficients and applications, Euler Cauchy and Power series solutions .
3. Higher Order ODEs.- homogeneous and non-homogeneous with constant coefficients and Euler Cauchy.
4. 2D linear constant coefficient homogeneous systems, phase plane, critical points, and criteria for critical points.
5. Laplace Transforms and solving ODE's using Laplace Transforms
6. Level curves and sketching regions in space
7. Limits and continuity of functions of two variables
8. Partial differentiation
9. Chain rule
10. Gradient vectors and directional derivatives
11. Equations of normal lines and tangent planes
12. Maxima, minima and saddle points
13. Lagrange multipliers
14. Double integrals in rectangular and polar coordinates and applications
15. Triple integrals in rectangular, cylindrical and spherical coordinates and applications.

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
Quiz	Approx. 30 minutes	10	N	Individual	N
Numerical Problem Solving	90 minutes	30	N	Individual	N
Quiz	Approx 30 minutes	10	N	Individual	N
End-of-session Exam	2 hours +30 min for submission	25	Y	Individual	Y
Viva Voce	20 min per student	25	Y	Individual	Y

Teaching Periods

Quarter 4 (2025)

Nirimba Education Precinct

Hybrid

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

View timetable (https://classregistration.westernsydney.edu.au/odd/timetable/?subject_code=MATH1020_25-Q4_BL_3#subjects)

Penrith (Kingswood)

Hybrid

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

View timetable (https://classregistration.westernsydney.edu.au/odd/timetable/?subject_code=MATH1020_25-Q4_KW_3#subjects)