

MH2811 Mathematics II

[Lectures: 26 hours; Tutorials: 13 hours; Pre-requisites: MH1810@; Academic Unit: 3.0]

Learning Objective

This course builds on the first-year mathematics and prepares students for the solution and interpretation of practical problems encountered in engineering disciplines with emphasis given to strengthening student's problem-solving abilities.

Content

Partial Differentiation, Multiple Integrals, Fourier series & Fourier integrals, First order differential equations, Second order differential equations, Partial differential equations, Vector calculus, Laplace transformations, Numerical analysis.

Learning Outcome

Upon successful completion of the course, students will be able to:

- understand the concept of Fourier Series / Integrals and know how to solve these problems.
- perform partial differentiation on functions of multiple variables and apply it for practical applications such as gradient vectors, tangent planes, etc.
- Perform multiple integration and apply it to evaluate areas, volumes, etc.
- solve first and second order ordinary differential equations (ODEs) in practical problems.
- solve partial differential equations (PDEs) for engineering problems such as heat and mass transport.
- solve analytical equations using numerical methods.
- understand vector calculus and its applications in engineering problems.
- understand Laplace Transformations and its applications in engineering problems.

Textbook/References

Kreysgiz E, Advanced Engineering Mathematics, 9th edition, John Wiley & Sons, 2006