

MTH211e Fundamentals of Mathematical Methods and Mechanics

Level: 2

Credit Units: 5 Credit Units

Language: ENGLISH

Presentation Pattern: EVERY JAN

E-Learning: BLENDED - Learning is done MAINLY online using interactive study materials in Canvas. Students receive guidance and support from online instructors via discussion forums and emails. This is supplemented with SOME face-to-face sessions. If the course has an exam component, this will be administered on-campus.

Synopsis:

MTH211 is concerned with the use of mathematics to solve real-world problems. Part of it deals with the representation of relevant aspects of the real world in the form of mathematical models; another part is concerned with the mathematical methods that are useful in working with these models. The material of the course is organized in a way that reflects these broad divisions. By far the most important element of the models part of the course is the study of Newtonian mechanics. Newtonian mechanics is the basic source of models of the motion of objects of ordinary size moving with ordinary speeds (or not moving at all), and it underpins much of physical science and mechanical engineering.

Topics:

- Review of Mathematical principles
- First order differential equations
- Second order differential equations
- Vector algebra
- Statics
- Newtonian mechanics in one-dimension

Learning Outcome:

- Identify a variety of mathematical techniques for applied mathematical problems.
- Present methods of differentiation and integration.
- Interpret first and second order differential equations.
- Apply vectors and vector algebra to a variety of problems.
- Solve static and force problems with vectors.
- Apply Newtonian mechanics.
- Apply a range of mathematical techniques to solve a variety of quantitative problems.
- Analyze and solve problems individually and/or as part of a group.
- Solve a number of problem sets within strict deadlines.
- Solve problems related to mathematical methods and mechanics using Mathcad.

Assessment Strategies:

Continuous Assessment Component	Weightage (%)
COMPUTER MARKED ASSIGNMENT	8
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COMPUTER MARKED ASSIGNMENT	8
PRE-CLASS QUIZ	2
PRE-CLASS QUIZ	2
PRE-CLASS QUIZ	2
Sub-Total	30

Examinable Component	Weightage (%)
Written Exam	70
Sub-Total	70

Weightage Total **100**