

EN6907

Mathematics for Engineers 1



Course Aim The course is designed to give students detailed knowledge and understanding of a wide range of applications of mathematics in engineering.

Short Title
Faculty EDICT
Polytechnic Level
Credits 15
Pre-requisites None
Co-requisites None
Anti-requisites None

Version 2
Effective From September 1, 2016
Indicative NQF Level 6
Student Contact hrs 90
Self-directed hrs 60
Other directed hrs 0
Total learning hrs 150

Learning Outcomes On successful completion of this course, students will be able to:

- 1 Solve advanced applications of linear systems
- 2 Apply trigonometry to solve engineering problems
- 3 Apply principles of exponential and logarithmic growth and decay
- 4 Apply various differentiation and Integration methods to routine engineering problems
- 5 Solve first order differential equations for engineering applications
- 6 Apply numerical methods for solving integration problems in engineering
- 7 Demonstrate an understanding of the concepts of complex numbers in engineering

NQF Sub-strand

Theoretical Understanding
 Practical Application of knowledge
 Practical Application of knowledge
 Practical Application of knowledge
 Generic, Problem Solving and Analytical Skills
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Topics / Content

- Simultaneous Equations
- Solution of simultaneous equations using matrix approach
- Trigonometric Functions of Real Numbers and Angles
- Exponential and Logarithmic Functions
- Differentiation
- Integration
- First order Differential equations
- Complex Numbers

Learning and Teaching Strategies Underpinning knowledge will be attained through directed tutorial sessions which will be supported by PBL based worksheets, independent homework and consolidated by tests. Practical knowledge and applications will be achieved through completion of two main practical PBL project-assignments within a team, allowing students to obtain the skills necessary to acquire data analyse and interpret results. Students will also be given the opportunity to discuss their work in detail. PBL is introduced in this course as for many students it will be their first encounter with this type of learning experience. This course primarily covers fundamental mathematical theory which students will later use for engineering applications.

Completion Requirements To obtain a Pass grade, a student must achieve a minimum of 60% aggregated over all assessments.

Assessment	Assessment Task Description	Weight (%)	Must Pass (Y/N)	Learning Outcomes Assessed	Form of Assessment Task
Assessment Method	Tests: Tests will demonstrate relevant underpinning knowledge gained and provide consolidation across the content range.	30%'	N	1,2,3,4,5,6,7	Examination (unseen)
	Assignments: A practical problem based project-assignments aimed at consolidation of the course content-topics and train students to work as a team.	20%'	N	1,2,3,4,5,6,7	Practical project
	Final Examination: A practical problem based project-assignments aimed at consolidation of the course content-topics and train students to work as a team.	50%'	N	1,2,3,4,5,6,7	Examination (unseen)
Assessment Method	Achievement				