Module: Mathematics 181

Module name:	Mathematics 181
Code:	MAT181
NQF level:	6
Type:	Core – Bachelor of Computing (all streams)
Contact time:	48 hours
Structured time:	8 hours
Self-directed time:	54 hours
Notional hours:	110 hours
Credits:	11
Prerequisites:	None

Purpose

Mathematics is an understanding of essential mathematical principles, mathematical thinking skills and reasoning. It is the application of mathematical methods and techniques to computational, business and applied mathematics problems.

Outcomes

Upon successful completion of this module, the student will be able to:

- Demonstrate an informed understanding of the core areas of mathematics, and an informed understanding of the key terms, concepts, facts, general principles, rules and theories of mathematics.
- Show an awareness of how knowledge or a knowledge system develops and evolves within mathematics.
- Select and apply standard methods, procedures or techniques within mathematics, and to plan and manage an implementation process within a well-defined, familiar and supported environment.
- Identify, evaluate and solve defined, routine and new problems within a familiar context, and to apply solutions based on relevant evidence and procedures or other forms of explanation appropriate to mathematics, demonstrating an understanding of the consequences.
- Gather information from a range of sources, including oral, written or symbolic texts, to select information appropriate to the task, and to apply basic processes of analysis, synthesis and evaluation on that information.

Assessment

Assessment is performed using a variety of instruments:

- Continuous evaluation of theoretical work through written assignment, formative, and a summative test.
- Final assessment through a written examination.
- The assignments or projects collectively will count 20% of your class mark.
- All tests will collectively account for 80% of your class mark.

- Your class mark contributes 30% towards your final mark for the subject, while the final assessment accounts for 70% of your final mark.

Teaching and Learning

Learning materials

Prescribed books (EBSCO)

- 🕮 Precalculus functions and graphs a graphing approach- Ron Larson & Robert P Hostetler & Bruce H Edwards & David C Falvo
- 🕮 Linear algebra c-1 - Linear equations, matrices and determinants - Leif Mejlbro
- 🕮 An Introduction to Vectors, Vector Operators and Vector Analysis - Pramod S. Joag
- 🕮 Schaum's Complex Variables - Spiegel, Murray R.
- 🕮 Discrete Mathematics for Computer Science – Garry Haggard, john Schlipf and Sue Whitesides

Additional Material

Presentation notes and hand-outs from direct instruction and feedback sessions;

- 🕮 Hong, S., et al. (2001). *Combinatorial & Computational Mathematics: Present and Future*. World Scientific Pub Co Inc. [ISBN: 978-9810246785]
- 🕮 Stroud, K.A. (2007). *Engineering Mathematics*. Palgrave. [ISBN: 9781403942463]
- 🕮 Logan, JD. (2006). Applied Mathematics. Wiley-Interscience. [ISBN: 978-0471746621]

Learning activities

The teaching and learning activities consist of a combination of formal lectures on theoretical concepts, exercises and discussions. Three mandatory assignments must be completed during the course. The experiences and progress on these practical components form the content of class discussions.

Notional learning hours

Activity	Units	Contact Time	Structured Time	Self-Directed Time
Lecture		40.0		21.0
Formative feedback		8.0		
Project				
Assignment	3			9.0
Test	3		6.0	11.0
Exam	1		2.0	13.0
		48.0	**8.0**	**54.0**

Syllabus

- Binary & Hexadecimal Numbering System
- Functions
- Advanced Algebra
- Complex Numbers
- Determinants
- Matrices

- Vectors
- Combinatorics