Module: Mathematics 281

Module name:	Mathematic 281
Code:	MAT281
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:	MAT181

Purpose

This module focuses on developing an understanding of essential mathematical principles, mathematical thinking skills and reasoning. Also covered 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 detailed knowledge of the main areas of mathematics, including an understanding of and the ability to apply the key terms, concepts, facts, principles, rules and theories of mathematics to unfamiliar but relevant contexts; and knowledge of an area or areas of specialisation and how that knowledge relates to other fields, disciplines or practices.
- Show an understanding of different forms of knowledge, schools of thought and forms of explanation within mathematics, and awareness of knowledge production processes.
- Evaluate, select and apply appropriate methods, procedures or techniques in investigation or application processes within a defined context.
- Identify, analyse and solve problems in unfamiliar contexts, gathering evidence and applying solutions based on evidence and procedures appropriate to mathematics.
- Evaluate different sources of information, to select information appropriate to the task, and to apply well-developed processes of analysis, synthesis and evaluation to that information.

Assessment

Assessment is performed using a variety of instruments:

- Continuous evaluation of theoretical work through written assignment, formative, and summative test.
- Final assessment through a written examination.

Teaching and Learning

Learning materials

Prescribed Book

Mathematics: Calculus – IT Without Frontiers.

Additional Material

- 🕮 Presentation notes and hand-outs from direct instruction and feedback sessions;
- 🕮 Larson, R., Edwards, B., (2013). *Calculus*. Cengage Learning. ISBN: [978-1285057095]
- 🕮 Stroud, K.A. (2007). *Engineering Mathematics*. Palgrave. [ISBN: 9781403942463]
- 🕮 Balzarini et al. (2012). *Pre-Calculus*. McGraw-Hill Ryerson. [ISBN: 978-0070738720]

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

- Differentiation
- Integration
- Application of Calculus