Module: Mathematics 161 (Deaf)

Module name:	Mathematics 161 (Deaf)
Code:	D-MAT161
NQF level:	5
Type:	Core – Diploma in Information Technology (all stream)
Contact time:	42 hours
Structured time:	8 hours
Self-directed time:	50 hours
Notional hours:	100 hours
Credits:	10
Prerequisites:	None

Purpose

The aim of this module is to develop an understanding of essential mathematical principles, mathematical thinking skills and reasoning. The application of mathematical methods and techniques to computational, business and applied mathematics problems is also covered.

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 mathematical concepts like arithmetic, algebra, functions, matrices, numbering systems and financial 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.
- Demonstrate a basic ability in gathering relevant information, analysis and evaluation skills, and the ability to apply and carry out actions by interpreting information from text and operational symbols or representations.
- Demonstrate the ability to take account of, and act in accordance with, prescribed organisational and professional ethical codes of conduct, values and practices and to seek guidance on ethical and professional issues where necessary, in financial mathematics.
- Demonstrate the ability to evaluate his or her performance or the performance of others, and to take appropriate action where necessary; to take responsibility for his or her learning within a structured learning process; and to promote the learning of others.

Assessment

Assessment is performed using a variety of instruments:

- Continuous evaluation of theoretical work through two written assignments, two formative assessments, and a summative test.
- Continuous evaluation of classwork, whereby the student must create and deploy a solution according to some set requirements.
- 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)

- 🕮 ***Garry Haggard, John Schlipf and Sue Whitesides. (2006)*** **Discrete Mathematics for Computer Science.** ***Thomson Brooks/Cole. [ISBN: 9780534495015]***

Additional Material

- 🕮 ***Warner, S. J. (2018). Pure Mathematics for Beginners: a rigorous introduction to logic, set theory, abstract algebra, number theory, real analysis, topology, complex analysis, and linear algebra. Get 800. [9780999811757]***
- 🕮 ***Stroud, K.A. (2007).*** **Engineering Mathematics.** ***Palgrave. [ISBN: 9781403942463]***
- 🕮 ***Poole, D. (2006),*** **Linear Algebra.** ***Thomson Books. [ISBN: 9780534405960]***
- 🕮 ***Logan, JD. (2006).*** **Applied Mathematics.** ***Wiley-Interscience. [ISBN: 978-0471746621]***

Learning activities

Learning will be facilitated by the lecturer with student centred activities that involve problem-based learning where pupils are presented with challenges that replicate the situation in the real-world environment. This will be achieved through a combination between presentation of theoretical concepts, guided exercises, group work and discussions during the module. It is practice-oriented, with two mandatory assignments which must be completed during the course.

Notional learning hours

Activity	Units	Contact Time	Structured Time	Self-Directed Time
Lecture		40.0		20.0
Formative feedback		2.0		
Project				
Assignment	2			6.0
Test	3		6.0	11.0
Exam	1		2.0	13.0
		42.0	**8.0**	**50.0**

Syllabus

- Arithmetic
  - Natural Numbers
  - Integers (Multiplication / Division / Brackets / Precedence)
  - Factors and Prime Numbers
  - Fractions (Multiplication / Division / Brackets / Precedence)
  - Rations / Percentages
  - Powers
    - Laws of powers / Raising of powers
    - Multiplication / Division / Brackets / Precedence
    - Roots
- Algebra
  - Algebraic Expressions
    - Constants / Variables
    - Rules of Algebra / Precedence Rules
    - Terms and Coefficients
  - Powers (Rules of Indices)
  - Multiplication of Expressions (Single variables)
  - Factorization
    - Quadratic expressions as the product of two simple factors
    - Factorization of a quadratic expression
- Functions
  - Linear Functions
  - Quadratic Functions
- Matrices
  - Definition / Notation / Equal Matrices
  - Addition / Subtraction / Multiplication
  - Transpose / Special Matrices
  - Determinant of a square matrix
- Numbering Systems
  - Decimal Numbering Systems
  - Binary Numbering Systems
  - Hexadecimal Numbering Systems
- Set
  - Describing Sets and Subsets
  - Unions and Intersections
  - Operations on Sets
  - Open and Closed Sets