

MT131 Module Specification

1. Factual information			
Module title	MT131: Discrete Mathematics	Level	1
Module tutor		Credit value	15
Module type	Taught	Notional learning hours	4

2. Rationale for the module and its links with other modules
<p>This is an elementary level module which introduces various topics in discrete mathematics. It offers a clear and comprehensive survey of logic operations, predicates, quantifiers, sets, functions, relations. Also, the module provides the concept of permutations, combinations and counting techniques which are needed as prerequisite in most of technology and communication modules. Moreover, the module gives some knowledge of relevant algorithmic ideas in number theory and cryptography that are widely used in data structure, data base, programming, data communication and in scientific research.</p>

3. Aims of the module
<p>The course aims to:</p> <ul style="list-style-type: none"> • Introduce basic notations used in discrete Mathematics associated with information and communication technology • Teach the rudiments of elementary mathematical reasoning. • Prepare students for the theoretical parts of further courses in information technology. • Explain logic from a mathematical perspective and relating it to computer applications. • Introduce set theory, relations, functions, graphs, equivalence relations, and partial orderings. • Provide concepts of permutation, combination and any other counting techniques.

4. Pre-requisite modules or specified entry requirements
EL111

5. Intended learning outcomes	
A. Knowledge and understanding	Learning and teaching strategy
<p>Students will be able to:</p> <p>A.1. Identify propositional logic, logical equivalence, predicates and quantifiers.</p> <p>A.2. Describe the Integers and division functions, prime number and prime factorization, least common multiple and highest common factors.</p> <p>A.3. Define sets, functions and binary relations, their properties and representations. Know the major types of binary relations on a set, equivalence relations and partial orderings.</p> <p>A.4. Use matrices to represent relations, graphs and trees.</p> <p>A.5. Recognize basic properties of counting techniques using permutation and combination properties.</p>	<ul style="list-style-type: none"> • Knowledge and understanding are acquired from a teaching textbook, reference textbooks, directed reading, multi-media packages computer mediated, web-based resources. • 25% face-to-face tutorial sessions. • TMA work. • Office hours. • Learning from the feedback on the continuous assessment components (TMA work + MTA). • Forums on the LMS.

B. Cognitive skills	Learning and teaching strategy
<p>Students will be able to:</p> <p>B.1. Deal with mathematical and logical arguments and carry out mathematical and logical manipulations.</p> <p>B.2. Acquire a good understanding of the concepts and methods of discrete mathematics described in detail in the syllabus.</p> <p>B.3. Be familiar with mathematical notations related to computer science.</p>	<ul style="list-style-type: none"> • 25% face-to-face tutorial sessions. • TMA work. • Course learning booklets and e-learning support material. • Office hours. • Case studies. • Learning from the feedback on the continuous assessment components (TMA work + MTA). • Forums on the LMS.

C. Practical and professional skills	Learning and teaching strategy
<p>Students will be able to:</p> <p>C.1. Prove any simple mathematical theory using logic laws</p> <p>C.2. Use any or all of the previous tools in a significant information and communication technology application such as cryptography.</p> <p>C.3. Apply combinatorial principles and discrete mathematical structures that are central to mathematics and information technology.</p>	<ul style="list-style-type: none"> • 25% face-to-face tutorial sessions. • TMA work. • Course learning booklets and e-learning support material. • Case studies. • Office hours. • Learning from the feedback on the continuous assessment components (TMA work + MTA). • Forums on the LMS.

D. Key transferable skills	Learning and teaching strategy
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D. Key transferable skills	Learning and teaching strategy
<p>Students will be able to:</p> <p>D.1. Demonstrate study skills at a level appropriate to higher education, such as timetabling study; read critically for meaning and take effective notes; and use study aids such as dictionaries and glossaries;</p> <p>D.2. Present and communicate basic mathematical and logical arguments; communicate appropriately with their tutor and other students using email and online conferences;</p> <p>D.3. Locate information on a given subject from the World Wide Web.</p>	<ul style="list-style-type: none"> • 25% face-to-face tutorial sessions. • TMA work. • Course learning booklets and e-learning support material. • Case studies. • Office hours. • Learning from the feedback on the continuous assessment components (TMA work + MTA). • Forums on the LMS.

6. Indicative content
<ul style="list-style-type: none"> • Propositional logic • Propositional equivalences • Predicates and quantifiers • Sets • Set operations • Integers, division and algorithms • Cryptography and Hashing functions • Primes and greatest common divisors • Permutation and combination • Counting techniques • Matrices (zero-one only) • Functions and relations • Relations representation as set, graph and matrix • Closures of relations • Equivalence relations • Partial orderings

7. Assessment strategy, assessment methods and their relative weightings
<p>TMA Work: 20%</p> <p>MTA: 30%</p> <p>Exam: 50%</p>

8. Mapping of assessment tasks to learning outcomes														
Assessment Tasks	Learning outcomes													
	A1	A2	A3	A4	A5	B1	B2	B3	C1	C2	C3	D1	D2	D3
TMA	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
MTA	✓	✓	✓	✓	✓			✓			✓			
Exam	✓	✓	✓	✓	✓			✓			✓			

9. Teaching staff associated with the module	
Tutor's name and contact details	Contact hours
To be appointed at a later date.	

10. Key reading list				
Author	Year	Title	Publisher	Location
Kenneth H. Rosen	2013	Discrete Mathematics and its Applications, 7 th ed.	McGraw Hill	USA
Johnsonbaugh	2009	Discrete Mathematics, 7 th ed.	Pearson	USA
Dossey, Otto, Spence & Vanden Eynden	2006	Discrete Mathematics, 5 th ed.	Pearson	USA
Washburn, Marlowe & Ryan	2000	Discrete Mathematics, 1 st ed.	Pearson	USA
Stein, Drysdale & Bogart	2011	Discrete Mathematics for Computer Scientists	Addison-Wesley	USA

11. Other indicative text (e.g. websites)
http://arabou.edu.kw/ Web resources for the textbook Discrete Mathematical Structures Video Lecture Course: http://learnerstv.com/video/Free-video-Lecture-3587-Computers.htm

12. Disability Accommodation
Enquiries for academic accommodations by students with a documented disability and /or learning difficulties should be directed to the module tutor.

13. Academic Honesty
All AOU students should be committed to uphold the AOU's Honour Code which states that AOU students should <ul style="list-style-type: none"> • accept responsibility for learning • conduct themselves with honour and integrity at all times • not deceive • not plagiarize • not fabricate • not commit professional misconduct • not lie • not cheat • not steal • not personate • not accept the actions of those who plagiarize, cheat, lie, or steel • report violations of the Honour Code

Students should know that ignorance of the university rules and regulations will not be accepted as an excuse for violation of the AOU's Honour Code

For additional information please visit:

- <http://www.arabou.edu.kw>
- https://arabou.edu.kw/files/plagiarism_mat.pdf
- http://en.wikipedia.org/wiki/Academic_dishonesty