

MTC Module Descriptor

Title		Academic Session	2020-2021
PURE MATHEMATICS		Credit Points	N/A
		FHEQ Level	N/A
Module Code	MTCG1018	OQF Level	N/A
Module Short Code	GFP MATH2	Notional Hours	100
Owning Department	General Studies	Scheduled Hours	48
Release & Status	V 1.5	Release Date	April 2020
Delivery Mode	MTC Campus	Review Date	Nil
Module Assessment Board	MTCFdn	Module Lecturer(s)	Dr Rohit and others TBD
Module Co-ordinator	Dr Rohit Kumar Gehlot		
JACS Subject/Code	N/A	N/A	External Examiner TBN

Named Awards Using this Module	Code	Type	Teaching Block
General Foundation	R0367F	Core	TB2 /TB3

Abstract
<ul style="list-style-type: none"> • This module helps students to bridge the gap in mathematical skills between secondary school and higher education. • This module is common to all engineering students and is aimed at preparing the students to have a common foundation of basic mathematics skills that will enable the students to solve engineering problems and to understand other mathematics courses they will do in their engineering curricula.
Notes
<p>The contents of this module meet the requirements of OAAA (Oman Academic Accreditation Authority), 4.2.3 - a, c, d, h, j and k) and the EASA (European Aviation Safety Agency) Part 66 Module 1 for Licensed Aircraft Engineering, 1.2b, 1.3a, 1.3b and 1.3c, except for their assessment strategies.</p>

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Requirements of Oman's system of quality assurance (ROSQA-for MTC Internal use)

Contribution to ROSQA Learning Outcomes: (Knowledge (K), Cognitive Skills (CS), General Competencies (GC)):

The attributes delivered in this module are designed to meet ROSQA Learning Outcomes for OQF Level 1 (Certificate).

Requisites Statement

None.

Aims (10 max.)

1	To ensure that students are equipped with the mathematical understanding and skills necessary to meet the cognitive and practical requirements of postsecondary or higher education studies in a variety of disciplines.
2	To provide the knowledge of fundamentals in elementary mathematics and familiarize with its relevant terminology.
3	To develop the students mental mathematical skills.
4	To apply mathematical concepts and procedures to selected real-life problems.

Learning Outcomes (10 max.) – On successful completion of this module, students should be able to:

1	Demonstrate understanding of the definition of a function and its graph.
2	Logarithm. Define and manipulate exponential and logarithmic functions and solve problems arising from real life applications.
3	Understand the inverse relationship between exponents and logarithms functions and use this relationship to solve related problems.
4	Understand basic concepts of descriptive statistics, mean, median, mode and summarize data into tables and simple graphs (bar charts, histogram, and pie chart).
5	Understand basic probability concepts and compute the probability of simple events using tree diagrams and formulas for permutations and combinations.
6	Understand the concept and determine average and average speed.
7	Determine the surface areas, the volumes and capacities of common shapes and 3-dimensions figures (square, rectangle, parallelogram, trapezium, cuboid, cone, pyramid and prisms).
8	Represent points given in polar form on a plane and discuss their characteristics. Convert coordinates of a point from Cartesian form to polar form and vice-versa.
9	Carry out inter conversions between decimal, binary, octal & hexadecimal systems and addition and subtraction of binary numbers.
10	Use the law of sines and cosines to solve a triangle and real life problems.

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Syllabus (10 max)- The Topics covered in the module will include:	
1	Functions and graphs <ul style="list-style-type: none"> • Definition of function • Domain and range • Types of functions • Composite function
2	Exponential and logarithm functions <ul style="list-style-type: none"> • Logarithm and its properties • Graph exponential functions • Exponential & logarithmic functions • Applications in real life
3	Inverse relation between exponential and logarithm functions <ul style="list-style-type: none"> • Conversion of exponential to logarithm function • Conversion of logarithm to exponential function
4	Statistics <ul style="list-style-type: none"> • Basic concepts of descriptive statistics • Measures on central tendency (mean, median & mode) • Measures on dispersion (variance & standard deviation) • Simple graphs (bar charts, histogram, and pie chart)
5	Probability <ul style="list-style-type: none"> • Understand basic probability concepts • Problems based on tree diagram • Formulas for permutations and combinations
6	Averages <ul style="list-style-type: none"> • Average • Average speed
7	Perimeter, Area and Volume <ul style="list-style-type: none"> • Determine area and perimeter for 2-dimensions figures (circle, triangle, square, rectangle, parallelogram, and trapezium) • Determine the surface areas and volumes for 3-dimensions figures (cube, cuboid, cone, cylinder, sphere, pyramid and prism)
8	Polar coordinates <ul style="list-style-type: none"> • Represent points given in polar and Cartesian form on a plane and discuss their characteristics • Convert coordinates of a point from Cartesian form to polar form and vice-versa
9	Number system and conversions <ul style="list-style-type: none"> • Inter conversions between decimal, binary, octal & hexadecimal systems • Addition and subtraction of binary numbers

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10	Law of sines and cosines to solve a triangle <ul style="list-style-type: none"> • Law of sines • Law of cosines
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Learning and Teaching Strategy

The module will be delivered in one trimester through forty eight contact hours via presentations, lectures and tutorials.

Students will be provided with comprehensive teaching/learning material, worked examples in class and problem sheets to develop their skills.

Students will undertake Guided Self Study, including the use of the VLE, and directed to resources such as online tutorials, notes, interactive presentations and simulations, including use of videos etc.

Formative tests, with feedback, will be given throughout the module to help the student to prepare for the summative assessment of the module.

#	Activity Type	Description	QAA Activity	Hours
1	Lecture	Teaching Learning outcomes 1 - 10	Lecture	48

Assessment Strategy- Direct Entry/ HEAC (GSD-Exit Exam)

The module will be assessed through summative assessments, namely: Final Exam, to cover **all Learning Outcomes** and will have a duration of 75 minutes.

This assessment plan will be implemented whether online or paper-based testing depending on the MTC Exams regulations.

Second Attempt Assessment (Re-sit)- Direct Entry/ HEAC (GSD-Exit Exam)

Second attempt assessment will be **75 minutes** examination to cover **all Learning Outcomes**.

The maximum marks obtained by the students will be capped at 60% (minimum passing requirements).

Direct Entry/ HEAC (GSD-Exit Exam)

Item	Assessment	Weighting	Assessment Type	Final Artefact	Pass Mark	Description
1	Final Exam	100%	Online/Written Exam	Yes	60%	75 Minutes duration

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Indicative Reading

Core Text:

The MTC Module Teaching Notes issued to students by the course team at the start of the module.

Recommended Reading:

- Raymond A. Barnett, Michael R. Zigler and Karl E. Byleen, 7th edition, *College Algebra with Trigonometry*, McGraw Hill.
- Margaret Lial John Hornsby, David I. Schneider Callie Daniels, *College Algebra and Trigonometry*, Pearson, 5th Edition.
- Bird J, (5th Ed 2010), *Basic Engineering Mathematics*, Newnes, ISBN13: 9781856176972
- Stroud K.A and Booth D.J, (7th Ed 2013), *Engineering Mathematics*, Industrial Press, Inc. ISBN13: 9780831134709