

# MTC Module Descriptor

<b>Title</b>		<b>Academic Session</b>	2018-2019
<b>PURE MATHEMATICS</b>		<b>Credit Points</b>	N/A
		<b>FHEQ Level</b>	N/A
<b>Module Code</b>	MTCG1018	<b>OQF Level</b>	N/A
<b>Module Short Code</b>	GFP MATH2	<b>Notional Hours</b>	100
<b>Owning Department</b>	General Studies	<b>Scheduled Hours</b>	48
<b>Release &amp; Status</b>	V 1.3	<b>Release Date</b>	September 2018
<b>Delivery Mode</b>	MTC Campus	<b>Review Date</b>	Nil
<b>Module Assessment Board</b>	MTCFdn	<b>Module Lecturer(s)</b>	Dr. Rohit and others TBD
<b>Module Co-ordinator</b>	Dr. Rohit Kumar Gehlot		
<b>JACS Subject/Code</b>	N/A	N/A	<b>External Examiner</b> TBN

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

<b>Abstract</b>
<ul style="list-style-type: none"> <li>• This module helps students to bridge the gap in mathematical skills between secondary school and higher education.</li> <li>• 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.</li> </ul>
<b>Notes</b>
<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.)

<b>1</b>	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.
<b>2</b>	To provide the knowledge of fundamentals in elementary mathematics and familiarize with its relevant terminology.
<b>3</b>	To develop the students mental mathematical skills.
<b>4</b>	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:

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

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

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<b>10</b>	<p><b>Law of sines and cosines to solve a triangle</b></p> <ul style="list-style-type: none"> <li>• Law of sines</li> <li>• Law of cosines</li> </ul>
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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 covering learning outcomes 1 - 10	Lecture	48

## Assessment Strategy

The module will be assessed through continuous assessments, namely: Quiz, Mid-Term and Final Exam.

Regular graded continuous assessments will be used to provide guidance and feedback to the students on progress. To enable personal improvement, the marked continuous assessments only Quiz will be reviewed by the students in the class and will be taken back by the teachers and the generic feedback of Midterm and Final Exams will be provided in the Moodle.

### First Attempt Deferred Assessment

Deferred First Attempt Assessment will be an examination to cover learning outcomes/topics covered in that exam, otherwise will be by **one and half hour** examination to cover all Learning Outcomes.

### Second Attempt Assessment (Re-sit)

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Second attempt assessment will be by a **one and half hour** examination to cover all Learning Outcomes. The maximum marks obtained by the students will be capped at 50% (minimum passing requirements).

Item	Assessment	Weighting	Assessment Type	Final Artefact	Pass Mark	Description
1	Quiz	10%	Written exam	No	-	30 Minutes duration
2	Mid-Term	40%	Written exam	No	-	1 Hour 15 Minutes duration
3	Final Exam	50%	Written exam	Yes	-	1 Hour 30 Minutes duration
	TOTAL	100%			50%	

### 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, 7<sup>th</sup> edition, *College Algebra with Trigonometry*, McGraw Hill.
- Margaret Lial John Hornsby, David I. Schneider Callie Daniels, *College Algebra and Trigonometry*, Pearson, 5<sup>th</sup> Edition.
- Bird J, (5<sup>th</sup> Ed 2010), *Basic Engineering Mathematics*, Newnes, ISBN13: 9781856176972
- Stroud K.A and Booth D.J, (7<sup>th</sup> Ed 2013), *Engineering Mathematics*, Industrial Press, Inc. ISBN13: 9780831134709

# MTC Module Descriptor

## Approval of the GSD-Pure Mathematics Module Descriptor

Dr. Rohit Gehlot  
Module Coordinator

Dr. T. Raja Rani  
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Mr. Ahmed Dissi  
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VDAA