

<b>Short Title:</b>	Information Technology Maths <b>APPROVED</b>
<b>Full Title:</b>	Information Technology Mathematics
<b>Module Code:</b>	COMP H2026
<b>ECTS credits:</b>	5
<b>NFQ Level:</b>	6
<b>Module Delivered in</b>	<a href="#">4 programme(s)</a>
<b>Module Contributor:</b>	Noel Carey
<b>Module Description:</b>	To provide the student with the knowledge and understanding of the mathematical theories, tools and techniques required in Information Technology. This module will allow students advance their mathematical skills in problem solving, mathematical theories and computation and aid the development of their mathematical ability for computing in Information Technology.
<b>Learning Outcomes:</b>	
<i>On successful completion of this module the learner will be able to</i>	
<ol style="list-style-type: none"> <li>1. Describe recursive functions and algorithms</li> <li>2. Apply integration and differentiation to solve computer science related problems</li> <li>3. Define and describe matrices and their application to computing</li> <li>4. Calculate statistical measures</li> <li>5. Interpret and present data using statistical graphs and charts</li> <li>6. Define probability and probability distributions to model uncertainty/variation</li> <li>7. Describe graph theory and trees and how the model structures in computing</li> </ol>	

## Module Content & Assessment

### Indicative Content

#### Recursion

Induction and Recursion Solving problems using recursive functions Writing recursive algorithms Recursive functions and programming

#### Differentiation and Integration

Differentiation from first principles Basic rules for derivatives The concept of a derivative as a 'rate of change' Rules of integration  
Calculate the area under a curve

#### Matrices

Definition of a Matrix Matrix arithmetic Square matrices, Inverses and Determinants Applications of Matrices in Computing

#### Statistics

Sources and collection of data Sampling Describing data, graphs, diagrams and charts Mean, Standard Deviation Median, mode and interquartile ranges

#### Probability and Probability Distributions

Probability Laws of probability Discrete and continuous probability distributions

#### Graph and Trees

Graphs and their representation Paths Graph traversals Trees Spanning and Binary trees

### Indicative Assessment Breakdown

	%
Course Work Assessment %	30.00%
Final Exam Assessment %	70.00%

### Course Work Assessment %

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Other	Continuous assessment work will include: problem worksheets based on theoretical and project work using software tools where appropriate	1,2,3,4,5,6,7	30.00	Every Week

### Final Exam Assessment %

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Formal Exam	End-of-Semester Final Examination	1,2,3,4,5,6,7	70.00	End-of-Semester

### Indicative Reassessment Requirement

#### Repeat examination

Reassessment of this module will consist of a repeat examination. It is possible that there will also be a requirement to be reassessed in a coursework element.

ITB reserves the right to alter the nature and timings of assessment

## Indicative Module Workload & Resources

### Indicative Workload: Full Time

Frequency	Indicative Average Weekly Learner Workload
Every Week	2.00
Every Week	2.00

### Resources

#### Recommended Book Resources

Peter Grossman,, *Discrete Mathematics for Computing* [ISBN: 0333981111]

Piff, Mike 1991, *Discrete Mathematics: An Introduction for Software Engineers*, Cambridge University Press

James L. Hein 2003, *Discrete Mathematics*, 2nd Ed., Jones and Bartlett

#### Supplementary Book Resources

McConnell, Jeffrey 2001, *Analysis of Algorithms*, Jones and Bartlett Computer Science Series

*This module does not have any article/paper resources*

*This module does not have any other resources*

## Module Delivered in

Programme Code	Programme	Semester	Delivery
BN_KISDF_8	<a href="#">Bachelor of Science (Honours) in Computing in Digital Forensics &amp; Cyber Security [240 ECTS credits]</a>	3	Mandatory
BN_KCOMP_8	<a href="#">Bachelor of Science (Honours) in Computing [240 ECTS credits]</a>	3	Mandatory
BN_KCOMP_7	<a href="#">Bachelor of Science in Computing in Information Technology [180 ECTS credits]</a>	3	Mandatory
BN_KCOMP_C	<a href="#">Higher Certificate in Science in Computing in Information Technology [120 ECTS credits]</a>	3	Mandatory