



الجامعة العربية المفتوحة
Arab Open University

MT129 Module Specification

Module title	MT129 : Calculus and Probability	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

This module introduces the concepts of differentiation and integration as well as some applications of differential and integral calculus. Moreover, the module offers a clear and comprehensive survey of the of data sampling, measurements of central tendency and spread, organizing and visualizing categorical and numerical data. It also includes topics in the basic probability such as events, simple probability, conditional probability, and Bayes' rule. Finally, it provides an introduction to fundamental basis and concepts of statistical inferences, normal distribution. The module has direct links to computing, programming and communication modules, in addition to the numerical analysis module.

3. Aims of the module

The module aims to:

- Apply the knowledge of elementary functions to calculus concepts.
- To compute the derivative of polynomials, rational, radical, trigonometric, exponential, and logarithmic functions.
- Evaluate the integrals of polynomials, rational, radical, trigonometric, exponential, and logarithmic functions.
- Introduce the terms and concept of probability, and the idea of discrete and continuous random variables.
- Ensure the understanding of mathematical expectations and moment generating functions concepts.
- Equip students with some important discrete and continuous probability distributions in technology and communication modules.

4. Pre-requisite modules or specified entry requirements

EL099

5. Intended learning outcomes	
A. Knowledge and understanding	Learning and teaching strategy
<p>Students will be able to:</p> <p>A.1. Use derivative rule to find derivatives of power, exponential, logarithmic and trigonometric functions.</p> <p>A.2. Solve simple definite and indefinite integrals.</p> <p>A.3. Use applications of differentiation and integration in sketching graphs, obtain area between curves and average value of functions.</p> <p>A.4. Define and identify random variables for any well- defined probability problems.</p> <p>A.5. Realize mathematical expectations and variances for different continuous and discrete distribution.</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 should be able to:</p> <p>B.1. Produce descriptions and explanations of the different types of elementary functions and apply their understanding of the studied functions to information systems.</p> <p>B.2. Display deep knowledge gained from the course and use it to solve optimization problems.</p> <p>B.3. Utilize knowledge gained from the course to help them to understand new unfamiliar probability distributions.</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. Apply the practical skills gained from differential and integral calculus ITC problems.</p> <p>C.2. Cultivate the capacity to be leaders in their professional and personal communities.</p> <p>C.3. Develop some technical statistical materials; effectively present and objectively evaluate them.</p> <p>C.4. Deal with statistical computer applications such as spread sheets and MATLAB statistics toolbox.</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
Students will be able to: D.1. Be aware of the implications of information technology in daily lives and on society as a whole, and the ability to utilize IT to communicate and solve problems. D.2. Use information, reasoning, and creative processes to solve problems and achieve goals. D.3. Implement global issues gained from module and their implications on their daily lives.	<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"> • Functions and their graphs • Introduction to the derivative and techniques of differentiation • Applications of the derivative • The integral and further integration techniques • Applications of definite integrals • Probability • Discrete and continuous random variables and distributions

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

8. Mapping of assessment tasks to learning outcomes															
Assessment Tasks	Learning outcomes														
	A1	A2	A3	A4	A5	B1	B2	B3	C1	C2	C3	C4	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
J. Goldstein, D.C. Lay & D.I. Schneider	2011	Calculus & Its Applications	Prentice Hall	USA
Lial, Greenwell & Ritchey	2012	Calculus with Applications, 10/e	Pearson	USA
Bittinger, Ellenbogen & Sargent	2012	Calculus and Its Applications, 10/e	Pearson	USA
D. Hughes-Hallett, A.M. Gleason	2011	Applied calculus	Wiley	USA

11. Other indicative text (e.g. websites)
<ul style="list-style-type: none"> • http://arabou.edu.kw/ • Gilbert Strange, Highlights of calculus, MIT Video Lectures, http://ocw.mit.edu/resources/res-18-005-highlights-of-calculus-spring-2010/ • Trigonometry for Calculus 56 Video Lectures (http://learnerstv.com/Free-Maths-video-lecture-courses.htm) • Introductory Calculus 24 Video Lectures http://learnerstv.com/Free-Maths-video-lecture-courses.htm • Fundamentals of Calculus 32 Video Lectures http://learnerstv.com/Free-Maths-video-lecture-courses.htm • Pre-calculus 33 Video Lectures http://learnerstv.com/Free-Maths-video-lecture-courses.htm • Single Variable Calculus 35 Video Lectures http://learnerstv.com/Free-Maths-video-lecture-courses.htm • Differential and Integral Calculus 17 Video Lectures http://learnerstv.com/Free-Maths-video-lecture-courses.htm • Highlights of Calculus 5 Video Lectures http://learnerstv.com/Free-Maths-video-lecture-courses.htm • Calculus Second Semester Integration 143 Video Lectures http://learnerstv.com/Free-Maths-video-lecture-courses.htm • Vector Calculus 143 Video Lectures http://learnerstv.com/Free-Maths-video-lecture-courses.htm • Homework Help for Single Variable Calculus 86 http://learnerstv.com/Free-Maths-video-lecture-courses.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

- 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 steal
- 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