

## SUBJECT DESCRIPTION FORM

---

Subject Title: Mathematics for Geomatics

Subject Code: AMA226

Credit Value: 3

---

Pre-requisite: Nil

---

Learning Activities:

Lecture	28 hours
Tutorial and Student Presentation	14 hours
	42 hours
Total	42 hours

The lectures aim to provide the students with an integrated knowledge required for the understanding and application of mathematical concepts and techniques. To develop students' ability for logical thinking and effective communication, tutorial and presentation sessions will be held.

---

Assessment:

Continuous Assessment	40%
Examination	60%
	100%
Total	100%

To pass this subject, students are required to obtain Grade D or above in **both** the Continuous Assessment and the Examination components.

---

Learning Outcomes:

The subject aims to introduce students to some basic tools in mathematics. The emphasis will be on application of mathematical methods to solving problems in surveying and geo-informatics.

Upon satisfactory completion of the subject, students are expected to be able to:

- (i) apply mathematical reasoning to analyse essential features of different problems;
- (ii) extend their knowledge of mathematical techniques and adapt known solutions to different situations in surveying;
- (iii) apply appropriate mathematical techniques to model and solve problems in geo-informatics;
- (iv) search for useful information and use statistical tables in solving statistical problems in the context of surveying and geo-informatics;
- (v) undertake continuous learning.

Syllabus:

*Calculus:*

Limits; Continuity; Derivatives; Techniques of differentiation; Applications in land surveying problems such as determination of extreme points of a parabolic curve; Definite and indefinite integrals; Techniques of integration; Geometric and physical applications in land surveying problems such as area and volume determination.

*Linear Algebra:*

Matrices and determinants; Vectors; Linear independence; Scalar and vector products; Systems of linear equations.

*Functions of several variables:*

Introduction to partial differentiation; Total differentials; Applications in land surveying problems such as optimization of functions.

*Probability and statistics:*

Concepts of statistics and probability; Mean, median and mode; Standard deviation and variance; Random variables; Normal and binomial distributions.

Textbooks and Reference Books:

H. Anton	Elementary Linear Algebra 9 <sup>th</sup> edition	John Wiley & Sons 2004
G.B. Thomas, R.L. Finney, J.R. Hass & F.R. Giordano	Thomas' Calculus 11 <sup>th</sup> edition	Addison Wesley 2004
L.J. Goldstein, D.I. Schneider & D.C. Lay	Calculus and its Applications 10 <sup>th</sup> edition	Prentice Hall 2003