Subject Description Form

Subject Code	AMA1100
Subject Title	Basic Mathematics - An Introduction to Algebra and Differential Calculus
Credit Value	2
Level	1
Pre-requisite/ Co-requisite/ Exclusion	Nil
Objectives	This subject aims to introduce students to the basic concepts and principles of algebra, limit and differentiation. It is designed for those students with only the compulsory mathematics component in the NSS curriculum. Emphasis will be on the understanding of fundamental concepts as well as applications of mathematical techniques in solving practical problems in science and engineering.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: (a) apply mathematical reasoning to solve problems in science and engineering; (b) make use of the knowledge of mathematical techniques and adapt known solutions to various situations; (c) apply mathematical modeling in problem solving; (d) demonstrate abilities of logical and analytical thinking.
Subject Synopsis/ Indicative Syllabus	Mathematical Induction; Binomial Theorem; Functions and inverse functions; Trigonometric functions and their inverses. Limit concepts, derivatives and their physical & geometric meanings, rules of differentiation, implicit differentiation, L'Hopital's rule, maxima and minima of a function.
Teaching/Learning Methodology	Basic concepts and techniques of topics in algebra and in elementary differential calculus will be discussed in lectures. These will be further enhanced in tutorials through practical problem solving.

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)			
		a	b	c	d
1.Homework, quizzes and mid-term test	40%	✓	✓	✓	✓
2. Examination	60%	✓	✓	✓	✓
Total	100 %				

Continuous Assessment comprises of assignments, in-class quizzes, online quizzes and a mid-term test. An examination is held at the end of the semester.

Questions used in assignments, quizzes, tests and examinations are used to assess students' level of understanding of the basic concepts and their ability to use mathematical techniques in solving problems in science and engineering.

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

The subject focuses on understanding of basic concepts and application of techniques in algebra, limit and differentiation. As such, an assessment method based mainly on examinations/tests/quizzes is considered appropriate. Furthermore, students are required to submit homework assignments regularly in order to allow subject lecturers to keep track of students' progress in the course.

Student Study Effort Expected

Class contact:	
▪ Lecture	19 Hrs.
▪ Tutorial	7 Hrs.
Other student study effort:	
▪ Self-study	44 Hrs.
Total student study effort	70 Hrs.

Reading List and References

Hung, K.F., Kwan W.C.K. & Pong, G.T.Y. Foundation Mathematics & Statistics, McGraw Hill 2013

Chung, K.C. A short course in calculus and matrices, McGraw Hill 2013

Lang, S. Short Calculus, Springer 2002