Subject Description Form

Subject Code	AMA2008
Subject Title	Introduction to Differential Equations
Credit Value	3
Level	2
Pre-requisite/ Co-requisite/ Exclusion	Pre-requisite: Intermediate Calculus and Linear Algebra (AMA2007) or Mathematics for Engineers (AMA2308) or Engineering Mathematics (AMA2380) or Engineering Mathematics for LSGI (AMA2318) or Applied Mathematics I (AMA2512) or Mathematics for Scientists and Engineers (AMA2882) or Engineering Mathematics (AMA290) Exclusion: Mathematics I (AMA2111), Mathematics II (AMA2112)
Objectives	This subject is to introduce students to the ideas and techniques of differential equations, with applications in physics, engineering, finance and economics.
Intended Learning Outcomes	Upon satisfactory completion of the subject, students should be able to: a. Gain a basic knowledge and understanding of ordinary and partial differential equations; b. Solve simple ordinary differential equations of the first and second order. c. Apply the method of separation of variables to solve simple partial differential equations. d. Apply differential equations theory to solve problems arising in physics, engineering, finance and economics.
Subject Synopsis/ Indicative Syllabus	*Ordinary differential equations* Modeling by ODE; First and second order linear ordinary differential equations; Laplace transforms, Convolution theorem; *Partial differential equations* Differential Calculus for functions of several variables; Modeling by PDE; Initial and boundary value problems; Classification of PDE; Method of separation of variables, Fourier transforms. Green functions and fundamental solutions.
Teaching/Learning Methodology	The subject will be delivered mainly through lectures and tutorials. The lectures will be conducted to introduce differential equations in the syllabus, which are then reinforced by learning activities involving demonstration, tutorial exercise and assignments.

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. CA	40%	✓	✓	✓	✓
2. Exam	60%	✓	✓	✓	✓
Total	100 %				

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

The subject focuses on knowledge, skill and understanding of **Differential equations**, thus, **Exam-based assessment** is the most appropriate assessment method, including 25% test and 60% examination. Moreover, 15% worth of assignments are included as a component of continuous assessment so as to keep the students in progress.

Continuous Assessment comprises of assignments and tests. A written examination is held at the end of the semester.

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

Student Study Effort Expected

Class contact:	
▪ Lecture	26 Hrs.
▪ Tutorial	13 Hrs.
Other student study effort:	
▪ Assignment	36 Hrs.
▪ Self-study	42 Hrs.
Total student study effort	117 Hrs.

Reading List and References

Chan, C.K., Chan, C.W. & Hung, K.F. (2013) Basic Engineering Mathematics. McGraw Hill

Kreyszig, E. Advanced Engineering Mathematics 10th edition
Wiley 2011

James, G. Advanced Modern Engineering Mathematics 3 rd edition Prentice Hall 2008