Subject Description Form

Subject Code	AMA618
Subject Title	Advanced Topics in Applied Mathematics
Credit Value	3
Level	6
Expected background knowledge	A course in calculus, linear algebra, and basic functional analysis
Objectives	This subject is to introduce students to some advanced topics in applied mathematics.
Intended Learning Outcomes *(Note 1)*	Upon completion of the subject, students will be able to: a. Learn how to use generalized functions, Fourier transform, singular integrals, Sobolev spaces, and related concepts; b. Learn how to use Laplace transform and semigroup theory to study time-dependent partial differential equations; c. Learn how to construct numerical approximations by using Laplace transform and semigroup techniques.
Subject Synopsis/ Indicative Syllabus *(Note 2)*	Banach spaces, generalized functions, Fourier transform, Fourier multipliers, singular integrals, Sobolev spaces, Laplace transform, second-order elliptic equations, heat equation, subdiffusion equation
Teaching/Learning Methodology *(Note 3)*	The subject will be delivered mainly through lectures and tutorials. Assignments and projects will be also given.

Assessment Methods in Alignment with Intended Learning Outcomes *(Note 4)*					
	Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)		
			a	b	c
	1. CA	50%	√	√	√
	2. Exam	50%	√	√	√
	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 advanced topics in applied mathematics. Thus exam-based assessment is the most appropriate assessment method, including 30% mid-term test and 50% examination. Moreover, 20% 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.

Student Study Effort Expected		
	Class contact:	
	▪ Lecture	26 Hrs.
	▪ Tutorial	13 Hrs.
	Other student study effort:	
	▪ Assignment/ mini-project	36Hrs.
	▪ Self-study	27Hrs.
	Total student study effort	102Hrs.

Reading List and References	1. Todd Arbogast and Jerry L. Bona: Methods of Applied Mathematics. Lecture notes, Department of Mathematics, The University of Texas at Austin. 2. L. C. Evans: Partial Differential Equations. American Mathematical Society, second edition, 2010.

Note 1: Intended Learning Outcomes
Intended learning outcomes should state what students should be able to do or attain upon subject completion. Subject outcomes are expected to contribute to the attainment of the overall programme outcomes.

Note 2: Subject Synopsis/Indicative Syllabus

The syllabus should adequately address the intended learning outcomes. At the same time, overcrowding of the syllabus should be avoided.

Note 3: Teaching/Learning Methodology
This section should include a brief description of the teaching and learning methods to be employed to facilitate learning, and a justification of how the methods are aligned with the intended learning outcomes of the subject.

Note 4: Assessment Method
This section should include the assessment method(s) to be used and its relative weighting, and indicate which of the subject intended learning outcomes that each method is intended to assess. It should also provide a brief explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes.