City University of Hong Kong
Course Syllabus

offered by College/School/Department of __Mathematics_____
with effect from Semester __B____ 20_17_ / _18_

Part I   Course Overview

Course Title:	**Engineering Mathematics and Statistics**
Course Code:	**MA2177**
Course Duration:	**1 semester**
Credit Units:	**3 CUs**
Level:	**B2**
Proposed Area: *(for GE courses only)*	☐Arts and Humanities ☐Study of Societies, Social and Business Organisations ☐Science and Technology
Medium of Instruction:	**English**
Medium of Assessment:	**English**
Prerequisites: *(Course Code and Title)*	**MA1200 Calculus and Basic Linear Algebra I /MA1300 Calculus and Basic Linear Algebra II and MA1201 Enhanced Calculus and Linear Algebra I /MA1301 Enhanced Calculus and Linear Algebra I or MA2176 Basic Calculus and Linear Algebra_or equivalent_**
Precursors: *(Course Code and Title)*	**Nil**
Equivalent Courses: *(Course Code and Title)*	**Nil**
Exclusive Courses: *(Course Code and Title)*	**MA2506 Probability and Statistics** **MA2172 Applied Statistics for Science and Engineering** **MA2181 Mathematical Methods for Engineering** **MA3181 Financial Mathematics II**

Part II   Course Details

1.   Abstract
(A 150-word description about the course)

This course aims to develop a basic understanding of a range of mathematics tools with emphasis on engineering applications in order to support later courses in mechanical and electronic themes. It is intended for students to solve some statistical problems and ordinary differential equations by analytical methods. Fourier series and Laplace transforms are also introduced. The course will help students develop skills and the ability to think quantitatively and analyse problems critically.

2.   Course Intended Learning Outcomes (CILOs)
(CILOs state what the student is expected to be able to do at the end of the course according to a given standard of performance.)

No.	CILOs#	Weighting* (if applicable)	Discovery-enriched curriculum related learning outcomes (please tick where appropriate)		
			A1	*A2*	*A3*
1.	explain at high levels concepts from differential equations, probability and statistics.	10%	√		
2.	implement basic operations in Fourier series, Laplace transforms and probability theory.	20%		√	
3.	solve some differential equations, explicitly or by series and transforms.	30%		√	
4.	perform statistical computations.	30%		√	
5.	develop statistical models or mathematical models through differential equations and probability theory, and perform computations for some applications.	10%	√	√	√
	* If weighting is assigned to CILOs, they should add up to 100%.	100%			

 # Please specify the alignment of CILOs to the Gateway Education Programme Intended Learning outcomes (PILOs) in Section A of Annex.

A1:   Attitude
Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

A2:   Ability
Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to self-life problems.

A3:   *Accomplishments*
Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

3.   Teaching and Learning Activities (TLAs)
(TLAs designed to facilitate students' achievement of the CILOs.)

TLA	Brief Description	CILO No.						Hours/week (if applicable)
		1	2	3	4	5	**6**	
Lectures	Learning through **teaching** is primarily based on lectures.	✓	✓	✓	✓	✓	✓	39 hours in total
Tutorials	Learning through **tutorials** is		✓					2 hours

		1	2	3	4	5	6	
	primarily based on interactive problem solving allowing instant feedback.			✓				2 hours
					✓			2 hours
						✓		1 hour
Take-home assignments	Learning through **take-home assignments** helps students understand basic concepts and techniques of ordinary differential equations, transforms, statistics, and some engineering applications.	✓	✓	✓	✓	✓	✓	after-class
Online applications	Learning through **online examples for applications** helps students apply statistical and computational methods to some problems in engineering applications.					✓		after-class
Math Help Centre	Learning activities in **Math Help Centre** provides students extra help.		✓	✓	✓	✓		after-class

4. Assessment Tasks/Activities (ATs)
(ATs are designed to assess how well the students achieve the CILOs.)

30% Coursework

70% Examination (Duration: 3 hours, at the end of the semester)

For a student to pass the course, at least 30% of the maximum mark for the examination must be obtained.

Assessment Tasks/Activities	CILO No.						Weighting*	Remarks
	1	2	3	4	5	6		
Continuous Assessment: _30___%								
Test		✓	✓				15-30%	Questions are designed for the first part of the course to see how well the students have learned the basic concepts, and techniques of ordinary differential equations and transforms, probability theory and some applications.

Hand-in assignments	✓	✓	✓	✓	✓		0-15%	These are skills based assessment to see whether the students are familiar with the basic concepts, techniques of ordinary differential equations, transforms, statistics and related applications in engineering.
Formative take-home assignments	✓	✓	✓	✓			0%	The assignments provide students chances to demonstrate their achievements on ordinary differential equations, transforms, and statistics and their applications learned in this course.
Examination: _70___% (duration: 3 hrs, if applicable)								Examination questions are designed to see how far students have achieved their intended learning outcomes. Questions will primarily be skills and understanding based to assess the student's versatility in ordinary differential equations, transforms, and statistics.

* The weightings should add up to 100%. 100%

5. Assessment Rubrics

(Grading of student achievements is based on student performance in assessment tasks/activities with the following rubrics.)

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B, B-)	Fair (C+, C, C-)	Marginal (D)	Failure (F)
1. Test	Ability to apply the methodology and procedure for solving some ordinary differential equations and statistical problems.	High	Significant	Moderate	Basic	Not even reaching marginal levels
2. Hand-in assignments	Ability to apply the methodology and procedure for solving some ordinary differential equations and statistical problems.	High	Significant	Moderate	Basic	Not even reaching marginal levels
3. Formative take-home assignments	Ability to apply the methodology and procedure for solving some ordinary differential equations and statistical problems.	High	Significant	Moderate	Basic	Not even reaching marginal levels
4. Examination	Ability to apply the methodology and procedure for solving some ordinary differential equations and statistical problems.	High	Significant	Moderate	Basic	Not even reaching marginal levels

Part III Other Information (more details can be provided separately in the teaching plan)

1. **Keyword Syllabus**
   (An indication of the key topics of the course.)

   Ordinary differential equations. Fourier series. Laplace transforms. Random variables. Probability. Distributions. Data and sample description. Estimation of parameters. Test of hypothesis. Simple linear regression.

2. **Reading List**
2.1 **Compulsory Readings**
   (Compulsory readings can include books, book chapters, or journal/magazine articles. There are also collections of e-books, e-journals available from the CityU Library.)

1.	For further detailed information, please refer to http://www6.cityu.edu.hk/ma/ug/serv/ma2177.htm
2.	
3.	
…	

2.2 **Additional Readings**
   (Additional references for students to learn to expand their knowledge about the subject.)

1.	Nil
2.	
3.	
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