City University of Hong Kong
Course Syllabus

offered by College/School/Department of _Mathematics_____
with effect from Semester __A____ 20_19_ / _20_

Part I Course Overview

Course Title:	**Computing Mathematics Laboratory**
Course Code:	**MA2507**
Course Duration:	**One Semester**
Credit Units:	**1**
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)*	**Grade B or above in MA1201 Calculus & Basic Linear Algebra II and subject to approval from MA must be obtained; or** **Grade C- or above in MA1301 Enhanced Calculus & Linear Algebra II**
Precursors: *(Course Code and Title)*	**Nil**
Equivalent Courses: *(Course Code and Title)*	**Nil**
Exclusive Courses: *(Course Code and Title)*	**Nil**

Part II Course Details

1. Abstract

(A 150-word description about the course)

This course aims to provide a computer laboratory type training for students on using analytical, numerical and statistical software tools. It develops students' ability to apply computing softwares as problem solving tools and to approach the solution of problems via computing mathematical techniques.

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.	manipulate mathematical and statistical software packages including MATLAB and MAPLE.			✓	
2.	implement basic commands of MATLAB in algebraic and arithmetic computations.			✓	
3.	design and interpret programs in MATLAB programming language.			✓	
4.	approach more complicated problems in algebra and calculus with the aid of MAPLE.			✓	
5.	construct and apply numerical methods algorithmically.				✓
6.	the combination of CILOs 1-5				
** 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.	✓	✓	✓	✓	✓	✓	14 hours in total
Laboratory	Learning through **laboratory**	✓			✓			4 hours

sessions	**sessions** is primarily based on interactive problem solving and question/answer sessions allowing instant feedback.		✓	✓				6 hours
						✓		2 hours
In-class exercise	Learning through **in-class exercises** helps students practise computing and programming skills introduced in lectures.	✓	✓	✓				6 hours in total
Take home assignments	Learning through **take-home assignments** requires students to perform mathematical computations with software packages and to solve numerical problems by writing programs.	✓	✓	✓	✓	✓		after-class
Project	Learning through **project** helps students apply numerical and computational techniques to solve a more sophisticated mathematical problem and to analyze its solution. It also helps students to communicate and collaborate effectively in the team.	✓	✓	✓	✓	✓		after-class

4. Assessment Tasks/Activities (ATs)

(ATs are designed to assess how well the students achieve the CILOs.)

100% coursework

Assessment Tasks/Activities	CILO No.						Weighting*	Remarks
	1	2	3	4	5			
Continuous Assessment: _100___%								
In-class exercises	✓	✓	✓				0-10%	These exercises provide hand-on computer practice to familiarize students with computing and programming techniques.
Test	✓	✓	✓	✓	✓		50%	Questions are designed to enable students to demonstrate manipulating skills of using software packages to perform calculations, to write commands and to analyze programs of

								numerical methods.
Hand-in assignments	✓	✓	✓	✓	✓		30-50%	These are skills based assessment to see how well the students have learned basic concepts of MATLAB programming and applied MAPLE as problem solving tools.
Project	✓	✓	✓	✓	✓		0-10%	Students are assessed on their ability in applying numerical and computational methods to solve mathematical problems, as well as on the presentation of numerical results with analysis.
** 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. In-class exercises	Ability to manipulate computing and programming techniques via hands-on computer practice.	High	Significant	Moderate	Basic	Not even reaching marginal levels
2. Test	Ability to demonstrate manipulating skills of using software packages to perform calculations, to write commands and to analyze programs of numerical methods.	High	Significant	Moderate	Basic	Not even reaching marginal levels
3. Hand-in assignments	Capacity to use basic concepts of MATLAB programming and applied MAPLE as problem solving tools	High	Significant	Moderate	Basic	Not even reaching marginal levels
4. Project	Ability to show their ability in applying numerical and computational methods to solve mathematical problems, as well as on the presentation of numerical results with analysis.	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.)

MATLAB and Numerical Computation. Python and Applications.

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.	Text(s): Stephen J. Chapman, "Essentials of MATLAB® programming", Thomson Nelson, 2006.
2.	D. Beazley & B. K. Jones, "Python Cookbook", O'Reilly, 2013
3.	
…	

2.2 Additional Readings

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

1.	
2.	
3.	
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