City University of Hong Kong
Course Syllabus

offered by College/School/Department of __Mathematics__
with effect from Semester __A__ 20_21_ / _22_

Part I   Course Overview

Course Title: **Selected Topics on Mathematics**

Course Code: **MA3530**

Course Duration: **One semester**

Credit Units: **1 credit unit**

Level: **B3**

Proposed Area: ☐ Arts and Humanities
(for GE courses only)   ☐ Study of Societies, Social and Business Organisations
                           ☐ Science and Technology

**Medium of
Instruction:**   **English**

**Medium of
Assessment:**   **English**

Prerequisites:
(Course Code and Title) **MA1301 Enhanced Calculus and 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 is a reading course that students have to read at least one classical and important textbook on selected mathematical topics that are suggested by their supervisors. They have to apply mathematical knowledge and analytical skills to solve practical/research problems. In this way, they gain research experience and develop problem-solving abilities. They need to give presentations on the materials that they learn from the textbooks and submit a report at the end of the course. This provides training to their presentation skill and enhances their report writing ability.

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.	Acquire fundamental knowledge on selected topics by reading classical textbooks		✓	✓	
2.	Apply mathematical knowledge and computing techniques of selected topic(s) to solve related problems.			✓	✓
3.	Acquire effective communication skills of presenting mathematical knowledge professionally.		✓	✓	
4.	Give presentations summarizing the materials learnt from textbooks and complete well-structured report.			✓	✓
5.	the combination of CILOs 1-4		✓	✓	✓

* 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		
Consultation	Learning through **consultation**	✓	✓	✓				10 hours in

	helps students identify appropriate themes of the research, acquire knowledge and techniques of specific topics from supervisors.						total
Seminar presentation	Learning through presentations enables students to report research development of a selected topic orderly and/or to relate its relevance to subject knowledge.			✓	✓	✓	3 hours in total

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

100% coursework assessment

(based on continuous progress, report and oral presentations)

Assessment Tasks/Activities	CILO No.						Weighting*	Remarks
	1	2	3	4	5			
Continuous Assessment: _100___%								
Continuous progress	✓	✓	✓	✓			40%	Student's progress is monitored regularly so as to identify any problem encountered in self-study and ensure he/she is likely to complete the reading of required materials timely in a satisfactory manner.
Report	✓	✓	✓	✓	✓		30%	It should include student's own account of investigations and findings, with a systematic and critical exposition of knowledge in literature.
Oral presentation				✓			30%	The student is required to present materials coherently, with all the necessary references stated.
Examination: __0__% (duration: , if applicable)								
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. Continuous Progress	Ability to understand research materials by self-study, problem solving skills	High	Significant	Moderate	Basic	Not even reaching marginal levels
2. Report	Evaluation is based on the following points: organization, method, results and practical significance.	High	Significant	Moderate	Basic	Not even reaching marginal levels
3. Oral Presentation	The statement of the problem solving; the ability of delivering complex concepts; the ability to answer questions	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.)

     The selected topics are from some classical textbooks in applied mathematics such as, ordinary differential equations, partial differential equations, dynamical systems, and etc. Students are required to gain a deep understanding of a particular topic and make clear written and oral presentations.

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.	
2.	
3.	
…	

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

1.	Lawrence C. Evans, Partial Differential Equations, 2nd Edition, Graduate Studies in Mathematics Volume 19, American Mathematical Society, 2010.
2.	Qing Han and Fanghua Lin, Elliptic Partial Differential Equations: 2nd Edition (Courant Lecture Notes), American Mathematical Society, 2011.
3.	Ali Hasan Nayfeh, Perturbation Methods, Wiley-VCH Verlag, 2004.
4.	Harmonic Analysis: Real-Variable Methods, Orthogonality, and Oscillatory Integrals, Princeton University Press, 1993.
5.	Deep Learning, The MIT Press, 2016