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:	**Real Analysis**
Course Code:	**MA4542**
Course Duration:	**One semester**
Credit Units:	**3 credit units**
Level:	**B4**
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)*	**MA2502 Calculus II or MA2508 Multi-variable Calculus**
Precursors: *(Course Code and Title)*	**MA3522 Analysis**
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 an introduction of some fundamental topics on real analysis, for example, set theory, Lebesgue measure, Lebesgue integrals and Lp spaces. It will help students extend their knowledge about analysis taught in basic calculus courses and make them ready for further studies in advanced numerical analysis and functional analysis.

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 level concepts from set theory.	10%	✓		
2.	understand the basic properties of Lebesgue measure, measurable sets and measurable functions.	30%	✓	✓	
3.	understand the definition and properties of the Lebesgue integral, and recognize its difference with the Riemann integral.	30%	✓	✓	
4.	explain clearly basic concepts of Lp spaces, and prove rigorously their elementary properties.	20%	✓	✓	
5.	the combination of CILOs 1-4.	10%			✓
6.					
		100%			

* If weighting is assigned to CILOs, they should add up to 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	✓	✓	✓	✓	✓		39 hours in total

	primarily based on lectures.										
Take-home assignments	Learning through **take-home assignments** helps students understand basic concepts of real analysis.	✓	✓	✓	✓						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.)

40% Coursework

60% Examination (Duration: 2 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: _40___%								
Test	✓	✓					20-40%	Questions are designed for the first part of the course to see how well students have learned the concepts from set theory and Lebesgue measure.
Hand-in assignments	✓	✓	✓	✓			0-20%	These are skills based assessment to help students understand properties of set theory, Lebesgue measure, Lebesgue integrals and Lp spaces.
Formative take-home assignments	✓	✓	✓	✓			0%	The assignments provide students chances to demonstrate their achievements on real analysis learned in this course.
Examination: _60___% (duration: 2 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 real 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. Test	Ability in problem solving	High	Significant	Moderate	Basic	Not even reaching marginal levels
2. Hand-in assignments	Creativity and Team work ability	High	Significant	Moderate	Basic	Not even reaching marginal levels
3. Formative take-home assignments	Study attitude	High	Significant	Moderate	Basic	Not even reaching marginal levels
4. Examination	Comprehensive ability in independent problem solving	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.)

Measurable sets, Measurable functions, Lebesgue measure, Lebesgue integrals, Lp spaces.

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.	
2.	
3.	
…	