City University of Hong Kong
Course Syllabus

offered by College/School/Department of __Mathematics__
with effect from Semester __A__ 20 _20_ / _21_

Part I   Course Overview

Course Title:	**Coordinate Geometry**
Course Code:	**MA1501**
Course Duration:	**1 semester**
Credit Units:	**3 CUs**
Level:	**B1**
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)*	**Nil**
Precursors: *(Course Code and Title)*	**Nil**
Equivalent Courses: *(Course Code and Title)*	**GE1358 Coordinate Geometry**
Exclusive Courses: *(Course Code and Title)*	**Nil**

Part II   Course Details

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

This course introduces students to coordinate geometry. The content includes curves in two dimensional space, curves in three dimensional space, surfaces in three dimensional space. The emphasis is on developing the concept of coordinate representation of some basic geometric objects in both two and three dimensional spaces and understanding how to compute some important geometric quantities like distance, normal vector, etc.

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 the concept of Cartesian coordinate, polar coordinate, and their usage for two dimensional curves	---	Y	Y	
2.	Explain the concept of curves based on Cartesian coordinate and parameterization, describe the tangent vector along curves, and explain how to compute distance between two non-intersected straight lines	---	Y	Y	Y
3.	Explain the concept of surface based on Cartesian coordinate, cylindrical and spherical coordinates, describe the normal vector and tangent plane of surfaces, explain the angle between two planes	---	Y	Y	Y
4.	The combination of CILOs 1-3	---	Y	Y	Y

* If weighting is assigned to CILOs, they should add up to 100%.   n/a

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			
Lecture	Learning through **teaching** is primarily based on lectures.	Y	Y	Y	Y			39 hours in total
Take-home assignments	Learning through **take-home assignments** helps students understand basic concepts and techniques of coordinate geometry.	Y	Y	Y	Y			After-class
Math Help Centre	Learning activities in **Math Help Centre** provides students extra help.	Y	Y	Y	Y			After-class

4. Assessment Tasks/Activities (ATs)

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

30% Coursework

70% 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				
Continuous Assessment: __30__%								
Tests	Y	Y	Y	Y			15 - 30%	Questions are based on curves in both two and three dimensional spaces, and surfaces to assess students' understanding of basic concepts and skills
Hand-in assignments	Y	Y	Y				0 - 15%	The questions enable students to apply basic concepts and techniques of coordinate geometry to a range of mathematical problems.
Formative take-home assignments	Y	Y	Y				0%	The assignments provide students chances to demonstrate their achievements on techniques of coordinate geometry learned in this course.
Examination (duration: 2 hrs)	Y	Y	Y	Y			70%	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 the methods of coordinate geometry.
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 fundamental concepts and methodology of coordinate geometry to solve a range of mathematical problems	High	Significant	Moderate	Basic	Not even reaching marginal levels
2. Hand-in assignments	Ability to understand the basic concepts and techniques of coordinate geometry	High	Significant	Moderate	Basic	Not even reaching marginal levels
3. Formative take-home assignments	Ability to demonstrate students' achievements on the methods of coordinate geometry learned in this course	High	Significant	Moderate	Basic	Not even reaching marginal levels
4. Examination	Ability to solve problems of curves and surfaces in two and three dimensional space	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.)

     curves, line, circle, ellipse, parabola, hyperbola, polar coordinate, parameterization, intersection between curves, surfaces in three dimensional space, plane, cylinder, sphere, ellipsoid, saddle, cylindrical and spherical coordinates, intersection between surfaces

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.	Coordinate Geometry (by Luther Pfahler Eisenhart) Dover Publications (March 4, 2005)
2.	
3.	
…	

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

1.	
2.	
3.	
…	