

Hong Kong Baptist University
Faculty of Science
Department of Mathematics

Title (Units): MATH 0011 Mathematics for Non-Science I (3,3,0)

Course Aims: This course provides the mathematics foundation for secondary school graduates from Mainland China to study in universities in Hong Kong. In particular, the course covers basic linear systems and basic calculus, which are studied by Hong Kong A-level students but not taught in high school in China. The applications of differentiation will also be introduced.

Prerequisite: Year 3 high-school mathematics in P.R. China

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Course Intended Learning Outcomes (CILOs):

Upon successful completion of this course, students should be able to:

No.	Course Intended Learning Outcomes (CILOs)
1	Explain the elementary ideas in matrix and vector
2	Carry out appropriate procedures to solve systems of linear equations
3	Recognize the basic ideas behind calculus
4	Apply basic calculus techniques to solve related problems
5	Articulate the diversity of the applications of linear equations and calculus

Teaching & Learning Activities (TLAs)

CILO	TLAs will include the following:
1-4	Lecture Lectures will be used to introduce the topics of the course's materials and examples will be used to demonstrate the introduced methodologies.
1-5	In-class activities Instructors will get students engage in discussions to foster their understanding on the key concepts of the course. Some examples of applications of the system of linear equations and calculus in different fields will be given to students. They will explore possible problems that can be solved by those methods. They will also formulate their knowledge via discussions and exercises in the tutorials.

Assessment:

No.	Assessment Methods	Weighting	CILO Addressed	Remarks
1	Continuous Assessment	30%	1,2,3,4,5	Assignments and mid-term test are designed to measure how well the students have learned various basic concepts in system of linear equations and calculus. These continuous assessments include, but not limited to, in class discussions and problem solving exercises.
2	Final Examination	70%	1,2,3,4	Final examination is designed to see how far students have achieved their intended learning outcomes. Students should have a thorough understanding on the concepts of the basic calculus and the system of linear equations, and the ways to apply them.

Course Intended Learning Outcomes and Weighting:

Content	CILO No.	Teaching (in hours)
I. Matrices	1	7
II. Gaussian elimination and Cramer's rule	1,2	7
III. Matrix inverse and linear system	1,2,5	7
IV. Limits	3	6
V. Differentiation	3,4	6
VI. Applications of limits and differentiation	3,4,5	6

Textbook: L.D. Hoffmann, G.L. Bradley, K.H. Rosen, Applied Calculus, for Business, Economics and the Social and Life Sciences, McGraw-Hill Int. Edition, 2005.

References: To be supplied.

Course Content in Outline:

	<u>Topic</u>	<u>Hours</u>
I.	Matrices	21
	A. Introduction	
	B. Matrices	
	C. Determinants	
	D. Cramer's rule	
	E. Inverse matrix and linear system	
II.	Fundamental Calculus (Part I)	18
	A. Elementary functions	
	B. Limits	
	C. Continuous functions	
	D. Differentiation	

- E. Fundamental theorems of differentiation
- F. Applications of differential calculus