



Cambodian Mekong University
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MB 108 (3 Credits): Mathematics for Engineering II

Course Description and Goals element

The study of mathematics in Foundation Year mainly focuses on the reviewing of the lessons that students have previously studied at high school. Meanwhile the course aims at extending the students' preexisting knowledge for a profound understanding of the calculation method, new finding, and new theory as the basic in practicing engineering and architecture skills.

The curriculum of the mathematics study divides into two parts such as geometry and analytical mathematics which include 10 Chapters.

Course Requirement

Required Textbooks:

1. Peter V. O'Neil, "Advance Engineering Mathematics", 1987
2. Courset Problemes Algebre Lineaire (Serie SCHAUM),1987
3. "Calculus HOWARD ANTON", 1995
4. D. KLENTENIK, "Problemes de geometrie analytique", Edition MIR MOSCOU, 1981
5. Michael D. Greenberg, "Advance Engineering Mathematics", 1998

Reading:

Students have to preview the lesson or do the exercises in the textbook in advance before coming to discuss in class. Schedule for previewing and doing exercises are listed at the back page. During the study in the semester, students will be provided extra materials which are to be discussed in class. If any students fail to participate in any session, they will miss the important part of the lesson. Also, students have to read and do more research for homework and assignment given by the teacher. Students have to arrange their schedule with appropriate plan from the beginning of the semester to avoid the surprised test items in the final exam.

Schedule and Teaching Method

Mathematics MB 108 consists of 48 hours within 16 weeks per semester. Students enrolling this subject have to attend the lecture for three hours in every session per week. And there will be a small group discussion added to the lecture. In the discussion session, students are able to ask many questions and do exercises concerned with what they have learnt. Also, this is the chance for students to solve the doubts and raise problems for analyze and discuss.

Grading Policy

No.	Description	Percentage
1	Attendance and Class participation	10%
2	Homework	10%
3	Short-Answer Question	10%
4	Mid-term Exam	20%
5	Group Assignment	10%
6	Final Exam	40%
Total		100%

There will be no make-up exam for those who miss the first exam. Absent without reasons in any exams is considered as failing the exam. Absent without reasons twice, students will fail the subject automatically.

Mid-term exam consists of two hours and students are not allowed to bring any documents (without instruction from the teacher) into the exam room. The exam starts during week 8 of the semester. The controlling of the mid-term exam is carried out within one hour in the class during week 7 or 8.

The result of the exam will be immediately giving feedback with the participation of the activities and questions in class and this participation will include the score of attendance and class participation. This short feedback is also used to follow up students' attendance.

Course Schedule and Outline

Week	Title	Lesson
	Chapter 1: Geometry of vector	Lesson 1-2
1	- Definition - Unit vector - Vector in the same direction	Lesson1
	Practice: Solution to Exercises on Geometry vector	
2	- Operation on the vectors - Scalar product of vector with scalar - Projection of a vector on one axe and a plane vector in a same plane	Lesson2
	Practice: Solution to Exercises on Geometry vector	
	Chapter 2: Coordinates of a vector	Lesson 3-4
3	- Basis of a system of coordinates - Decomposition of a vector - Decomposition of a vector with two vector	Lesson3
	Practice: Solution to Exercises on Coordinates of a vector	

4	- Equality of two vectors - Vectors combination	Lesson4
	Practice: Solution to Exercises on Coordinates of a vector	
	Chapter 3: Dot product of vectors& Dot Product	Lesson 5-6
5	Dot product of vectors - Definition - Angle of two vectors - Fundamental theorem - Property of dot product	Lesson5
	Practice: Solution to Exercise on Dot product of vectors	
6	Dot Product - Definition - Application of Dot product to a problem commonly encountered with calculation involving forces - Property of dot product - Law of cosines - Level curve - Property of dot product	Lesson 6
	Practice: Solution to Exercise	
	Chapter 4: Cross product of vectors	Lesson 7-8
7	- Definition - Property of cross product of vectors	Lesson 7
	Practice: Solution to Exercise	
8	- Analytic form - Application to Calculate Area of a triangle - Distance of a point to a straight line	Lesson 8
	Practice: Solution to Exercise	
	Chapter 5:Scalar triple product	Lesson 9
9	- Definition - Properties - Analytic form	Lesson 9
	Practice: Solution to Exercise	
	Chapter 6: Barycentre	Lesson 10
10	- Leibniz Function - Definition - Theorem - Properties	Lesson 10
	Practice: Solution to Exercise	
	Chapter 7: Line in a plane	Lesson 11
11	- Canonic equation - Parameter equation - General equation - Parallel line - Distance of a point to the line	Lesson 11
	Practice: Solution to Exercise	
	Chapter 8: Line in space and Plane	Lesson 12
12	- Parameter equation - Intersection of two planes	Lesson 12
	Practice: Solution to Exercise	
	Chapter 9: Equation of a plane	Lesson 13-14

13	- Parameter equation - Theorem - Special Planes	Lesson 13
	Practice: Solution to Exercise	
14	- Normal equation - Necessary condition of a straight line and a plane - Distance of a point to plane	Lesson 14
	Practice: Solution to Exercise	
Chapter 10: Transformation in the plane		Lesson 15-16
15	- Generality - Translation of a vector-Definition - Homothetic-Definition - Rotation-Definition - Reflection - Properties	Lesson 15
	Practice: Solution to Exercise	
16	- Composition of two transformations - Composition of two translations - Composition of a translation and a homothetic - Theorem	Lesson 16
	Practice: Solution to Exercise	

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