Subject Code: AMA229

BASIC ENGINEERING CALCULUS

Level: 2
Contact Hours: Lect:28 Tut:14
Student Effort Hours: 120

Assessment Method: Examination 60% Coursework 40%
Credit Value: 3
Pre-requisites: Nil
Co-requisites: Nil
Exclusions: Nil
Subject Leader/Lecturer/Dept.: (AMA)

Subject Aim:

This subject is intended to:
The lectures aim to provide the students with an integrated knowledge required for the understanding and application of mathematical concepts and techniques. To develop students’ ability for logical thinking and effective communication, tutorial and presentation session will be held.

Learning Outcomes:
The subject aims to introduce students to some basic skills of higher mathematics. The emphasis will be on application of mathematical methods to solving practical problems.

Upon satisfactory completion of the subject, students are expected to be able to:
(i) apply mathematical reasoning to analyse essential features of different problems;
(ii) extend their knowledge of mathematical techniques and adapt known solutions to different situations;
(iii) develop and extrapolate mathematical concepts in synthesizing and solving engineering problems;
(iv) undertake the formulation of mathematical problems through continuous self-learning.

Syllabus Content:
Limits and derivatives; Techniques of differentiation; Maxima and minima; Curve sketching; Definite and indefinite integrals; Fundamental Theorem of Calculus; Techniques of integration; Geometric and physical applications.

Learning and Teaching Approach (tasks and activities designed to achieve learning outcomes):

Assessment (assessment of student performance resulting from learning tasks):

<table>
<thead>
<tr>
<th>Continuous Assessment</th>
<th>40%</th>
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<tbody>
<tr>
<td>Examination</td>
<td>60%</td>
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<tr>
<td><strong>Total</strong></td>
<td>100%</td>
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To ensure that students learn and reflect continuously, Continuous Assessment is an important element and students are required to obtain Grade D or above in both the Continuous Assessment and the Examination components. The continuous assessment comprises of assignments, in-class quizzes and tests. The assignments are used to assist the students to reflect and review on their progress. The end-of-semester examination is used to assess the knowledge acquired by the students and their ability to apply and extend such knowledge.

Reading List:

Textbooks and Reference Books:
Department of Applied Mathematics, Foundation Mathematics, 3rd edition, The Hong Kong Polytechnic University, 2004
W. Bolton, Differentiation and Integration, Addison Wesley 1996