

**Course specification  
(1104 Mathematics 1)**

**Faculty:** HICIT

**Programme(s) on which the course is given:** Under graduate program in Computer Science

**Major or minor element of programme:** Core

**Department offering the programme:** Department of Computer Science

**Department offering the course:** Department of Computer Science

**Year / Class:** 1<sup>st</sup> Year – 1<sup>st</sup> Semester

**Date of specification approval:** 22/9/2015

**A- Basic Information**

**Title:** Mathematics 1

**Code:** 1104

**Weekly Hours:**

**Lecture:** 3

**Exercise:** 2

**Practical:-**

**Total:** 5

**B- Professional Information**

**1- Course Objectives:**

- Identifying the notion of Differentiation and Integration.
- Solving Problems on Differentiation and its applications.
- Solving problems on Integration and its applications.
- Applying the concepts of Differentiation and Integration on a real problems.

**2- Program ILOs Covered by Course**

<b>Program Intended Learning Outcomes</b>			
<b>Knowledge and understanding</b>	<b>Intellectual Skills</b>	<b>Professional and practical skills</b>	<b>General and Transferable skills</b>
<b>a1, a4</b>	<b>b1, b7, b8</b>	<b>c16</b>	

**3 - Intended learning outcomes of course (ILOs)**

After completing this course, the student should be able to:

**a- Knowledge and Understanding**

- a1. Know and understand the essential concepts related to Differentiation and Integration.
- a2. Know and understand the essential mathematics related to computer science.
- a3. Know and understand the different applications that need the different concepts of the course.

**b- Intellectual skills**

- b1. Solve a wide range of problems related to the construction and Implementation of computer systems.
- b2. solve any problem on any different concepts of the course that needs deep thinking skills.

**c- Professional and practical skills**

- c1. Apply mathematical techniques to solve different problems.

**d- General and transferable skills**

- d1. Communicate effectively by oral, written and visual means.
- d2. Work effectively as an individual and as a member of a team.
- d3. Develop Creativity and imagination skills, Self-assessment ability and Critical thinking and analytic ability.

**4- Contents**

Topics	Hours	Lec.	Exc.
Overview on Algebra, Functions and Their Graphs, Trigonometry.	5	3	2
Limits and Continuity, Introduction to Limits, Techniques for Finding Limits, Limits Involving Infinity Continuous Functions.	5	3	2
The Derivative: Tangent Lines and Rates of Change, Techniques of Differentiation Derivatives of the Trigonometric Functions, the chain Rule, Implicit Differentiation, Applications of the Derivative.	5	3	2
Derivative of the Inverse Function, The Natural Logarithm Function The Exponential Function. The hyperbolic Function.	15	9	6
Integrals: Ant derivatives, Indefinite Integral, and simple Differential Equations change of variables in Indefinite Integrals.	10	6	4
Techniques of Integration: Integration by Parts, Trigonometric Integrals.	10	6	4
Summation Notation and Area, The Definite Integral, Properties of the Definite Integral, The Fundamental Theorem of Calculus, Applications of the Definite and indefinite Integral.	15	9	6

**5- Teaching and learning methods**

- 4.1 Lectures
- 4.2 Tutorial Exercises
- 4.3 Discussions.

**6 -Student assessment methods**

- 6.1 Midterm Exam: To assess the knowledge and understanding achieved by the student during the previous weeks.
- 6.2 Final Exam: To evaluate what the student gain at the end of the course, and to assess: the knowledge and understanding, general skills, and intellectual skills.
- 6.3 Course Work & Quizzes: To keep the student always in the course, and to evaluate knowledge, understanding, intellectual, and transferable skills.

### Assessment Schedule

Assessment	Week #
Mid Term Exam	8
Final Exam	16
Course Work & Quizzes	2-14

### Assessment Weight

Assessment	Weight %
Mid Term Exam	10%
Final Exam	80%
Course Work & Quizzes	10%
Total	100

Course Work & Quizzes: (Short Exams, Assignments, Researches, Reports, Presentations, Class/Project discussion)

### 7 -List of references

#### 6.1 Text Books

- Calculus, Earl w. swokowski, 1994.

#### 6.2 Recommended books covering the calculus concepts.

### 8- Required Facilities

Non

### 9-Course Matrices

#### 9.1-Course Content/ILO Matrix

Course Contents	a1	a2	a3	b1	b2	c1	d1	d2	d3
Overview on Algebra, Functions and Their Graphs	√	√		√	√	√			
The Derivative	√	√		√	√	√			
Transcendental Functions	√	√		√	√	√			
Integrals	√	√		√	√	√			
Techniques of Integration	√	√		√	√	√			
The Definite Integral and Applications of the Definite Integral	√	√	√	√	√	√			

#### 9.2-Learning Method /ILO Matrix

Learning Methods	a1	a2	a3	b1	b2	c1	d1	d2	d3
Lectures	√	√	√	√	√	√			
Tutorial Exercises				√	√	√			
Discussions.				√	√	√	√	√	√

#### 9.3-Assessment Methods /ILO Matrix

<b>Assessment Methods</b>	<b>a1</b>	<b>a2</b>	<b>a3</b>	<b>b1</b>	<b>b2</b>	<b>c1</b>	<b>d1</b>	<b>d2</b>	<b>d3</b>
<b>Mid Term Exam</b>	√	√	√	√	√	√			
<b>Final Exam</b>	√	√	√	√	√	√			
<b>Course Work &amp; Quizzes</b>	√	√	√	√	√	√	√	√	√

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