



Mathematics I Course Specifications

Faculty: Computer and Informatics

Department: Computer Science

Program(s) on which the course is given	:	Bachelor in Computer and Information Sciences
Major or Minor element of programs	:	All majors
Department offering the program	:	Computer Science
Department offering the course	:	Basic Sciences
Academic year / Level	:	1st Year / B.Sc.
Date of specification approval	:	10/10/2009

A. Basic Information

Title: Mathematics I	Code: BSC 120	
Lectures: 4 hrs/week	Tutorial: 3 hrs/week	Practical: ---
Credit Hours: ---	Total: 7 hrs/week	

B. Professional Information

1. Overall Aims of Course:

The aim of the course is to provide an introduction to the Differential and Integral Calculus, studying the methods of differentiation and integration and their applications.

2. Intended Learning Outcomes of Course (ILOs):

a. Knowledge and Understanding:

- a1- Understand the concept of the derivative of a function and its geometrical and mechanical significance.
- a2- Criticize the basic rules of differentiation and be able to apply them to find first and higher derivatives of functions.

- a3- Know the elementary properties of the trigonometric functions, the inverse trigonometric functions, the exponential and logarithmic functions. Be able to differentiate expressions involving these functions.
- a4- Know about critical points of differentiable functions and their use in determining maxima and minima. Be able to apply these ideas in simple problems in optimization.
- a5- State the different methods of integration and their applications.
- a6- Understand the essential mathematics relevant to computer science.
- a7- Demonstrate basic knowledge and understanding of a core of analysis, algebra, applied mathematics and statistics.
- a8- Applying effectively computational modelling techniques to an application area from (Science, Technology, Engineering and Mathematics) fields.

b. Intellectual Skills:

- b1- Summarize the proposed solutions and their results.
- b2- Verifying solutions.
- b3- Observing results and attitudes.
- b4- Setting goals towards solving traditional and non-traditional problems.
- b5- Defining problems in precise scientific way.
- b6- Restrict solution methodologies upon their results.
- b7- Identify a range of solutions and critically evaluate and justify proposed design solutions
- b8- Criticize the methods of differentiation and integration.

c. Professional and Practical Skills:

- c1- Handle techniques of differentiation and integration in solving practical problems
- c2- Use of standard numerical recipes and mathematical libraries in problem solving.
- c3- Explore, and where feasible solve, mathematical problems, by selecting appropriate techniques.
- c4- Evaluate systems in terms of general quality attributes and possible tradeoffs presented within the given problem.
- c5- Prove and disprove assertions using a variety of techniques.

d. General and Transferable Skills:

- d1- Manage time effectively.
- d2- Present a clear, logical argument.
- d3- Work independently.
- d4- Solve practical problems in course projects.
- d5- Speeding up the computation of conventional mathematical problems as sorting, recursion, and matrix multiplication.
- d6- The ability to evaluate systems in terms of general and specific quality attributes.
- d7- Work within and contribute to a team, apply management skills such as co-ordination, project design and evaluation and decision processes.

e. Attitude:

- e1- A knowledge and respect of ethics and ethical standards in relation to a major area of study.
- e2- Relationship Emphasis a successful with other students.
- e3- Learn how to make relation with other, and the limit of this relation.
- e4- Know the culture of other peoples.

3. Contents:

Topic	No. of hours	Lecture	Tutorial/Practical
Functions, limits , and continuity of functions	14	8	6
Differentiation, basic derivative theorems , and applications	14	8	6
Integration: Basic properties of indefinite integrals and numerical methods glance	14	8	6
Some Applications of definite Integrals	14	8	6
Transcendental functions	14	8	6