

Course Specifications of  
Mathematics I – B111 2008/2009

University: Banha

Faculty: **Benha Faculty of engineering**

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Program on which the course is given : All programs

Major or minor elements of program : N.A.

Departments offering the program : All departments

Department offering the course : Department of Basic Science

Academic year/level : First year- First semester

Date of specification approval : / / 2009

**A - Basic Information**

Title : Mathematics

Code : B111

Credit Hours : N.A.

Lecture : 4

Tutorial : 2

Lab : 0

**B – Professional Information**

**1. Overall aims of the course**

By the end of this course the student will be able to:

- Know the concepts of sets and subsets.
- Manipulate operations on sets (union – intersection – difference – complement ... etc.
- State and prove laws of Boolean Algebra.
- Deal with logical statements and manipulate their algebra.
- Apply mathematical logic to expressing and simplifying digital circuits.
- Deal with different kinds of relations on sets and their representations.
- Differentiate between relations and mappings and determine the type of mappings.
- Deal with algebraic structures and its applications.
- Know the buildup of number systems and the evolution of the real number system and its topology.
- Deal with graphing of different kinds of functions (algebraic and transcendental).
- Grasp the concepts of limit and continuity of functions and evaluate limits.
- Differentiate real functions of one variable.
- Apply rules of differentiation to curve tracing, optimization problems, related rates and approximation.

**2. Intended Learning outcomes of the course**

(a) ***Knowledge and understanding***

- (i) Acquire knowledge for subsequent courses in mathematics.
- (ii) Acquire tools for introductory and advanced engineering courses.

(b) ***Intellectual skills***

- (i) Develop prerequisite analytical skills for subsequent courses in mathematics.
- (ii) Acquire familiarity with modeling physical and engineering problems.

(c) **Professional and practical skills**

N.A.

(d) **General and transferable skills**

N.A.

**3. Contents**

Topic	Nº of hours	Lecture	Tutorial
Sets	3	2	1
Elements of mathematical logic	3	2	1
Application of mathematical logic to switching theory	3	2	1
Relations	6	4	2
Mappings	3	2	1
Algebraic structures	3	2	1
The real number system, extended real number system and real intervals	3	2	1
Real functions and their graphs	6	4	2
Limits and continuity	3	2	1
Differentiation of real functions	6	4	2
Maximums and minimums – curve tracing	3	2	1
Optimization problems – related rates	3	2	1
First mean value theorem – approximation of functions	3	2	1

**4. Teaching and learning methods**

(a) **Lectures** (power point presentation recommended)

(b) **Class tutorials**

**5. Students' assessment methods**

(a) **Midterm examination**

(b) **Assignments and quizzes**

(c) **Final examination**

**5.1 Assessment schedule**

Weekly

**5.2 Weighting of assessments**

Class participation and attendance 10%

Assignments and quizzes 10%

Midterm examination 20%

Final examination 60%

**6. List of references**

**(i) Lecture Notes**

Discrete Algebraic Structures Staff members

One Variable Calculus Staff members

**(ii) Reference Books**

Thomas and Finney Latest edition

**7. Facilities required for teaching and learning**

Data show – projector

Course Coordinator

Head of Department