EN1201 – Introductory Mathematics
(Compulsory)

INTRODUCTION

This is one of the 2 enhancement modules designed for Semester 1 of Bachelor of Information Technology Degree program.

CREDITS: 02

LEARNING OUTCOMES

This course provides core mathematical knowledge and skills that are essential for a student of ICT. After successfully completing this course, students will be able to
- illustrate analytical thinking
- apply mathematical concepts to ICT
- demonstrate problem solving skills

MINOR MODIFICATIONS

When minor modifications are made to this syllabus, those will be reflected in the Virtual Learning Environment (VLE) and the latest version can be downloaded from the relevant course page of VLE. Please inform your suggestions and comments through the VLE. http://vle.bit.lk

ONLINE LEARNING MATERIALS AND ACTIVITIES

You can access all learning materials and this syllabus in the VLE: http://vle.bit.lk, if you are a registered student of BIT degree program. It is very important to participate in learning activities given in the VLE to learn this subject.

ONLINE ASSIGNMENTS

The assignments consist of two quizzes, assignment quiz 1 (It covers the first half of the syllabus) and assignment quiz 2 (It covers the second half of the syllabus). Maximum mark for a question is 10, minimum mark for a question is 0 (irrespective of negative scores). Final assignment mark is calculated considering 40% of assignment quiz 1 and 60% of assignment quiz 2. Pass mark for the online assignments in a course is 50. You are advised to do online assignments before the final exam of the course. It is compulsory to pass all online assignments to partially qualify to obtain year 1 certificate.

FINAL EXAMINATION

Final exam of the course will be held at the end of the semester.

OUTLINE OF SYLLABUS

Topics	Hours
1. Numbers and Arithmetic Operations	06
2. Basic Algebra	07
3. Solving Equations and Inequalities	10
4. Fundamentals of Measurements	06
5. Ratios and Proportions	03
6. Percentages	03
7. Fundamentals of Sequences and Series	05
TOTAL	**40**

REQUIRED MATERIALS

Main Reading:

Ref 1. New Comprehensive Mathematics for O' level by Greer, 2nd Edition. Stanley Thornes Ltd.

Ref 2. Schaum's Outlines Series; Basic Mathematics with applications to science and technology. 2nd Edition.

DETAILED SYLLABUS

1 Numbers and Arithmetic Operations (06 hrs)
[Ref 1: pg 1 – 17, 62 – 71, Ref 2: pg 1 – 8, 36 – 50]

Instructional Objectives

- Identifies types of numbers
- Understands the rules governing the application of arithmetic operations and recognizes the need for them
- Applies basic arithmetic operations on different types of numbers

Sub Topics

1.1 Types of numbers and representation on the number line.
1.2 The basic arithmetic operations and the rules governing their application
1.3 Application of basic arithmetic operations on different types of numbers

1.4 Rules governing the application of arithmetic operations.

2. Basic Algebra (07 hrs)
[Ref 1: pg 72 – 86, 95 – 100, Ref 2: pg 61 – 94]

Instructional Objectives

- Identifies variables, numerical expressions and algebraic expressions
- Factors and expands algebraic expressions
- Evaluates algebraic expressions
- Works with formulae

Sub Topics

2.1   Algebraic terminology
2.2   Expansion and factorization of algebraic expressions
2.3   Evaluation of algebraic expressions
2.4   Formulae

3. Solving Equations and Inequalities (10 hrs)
[Ref 1: pg 88 – 94, 101 - 111, 174 - 175, Ref 2: pg 106 – 130, 214 - 216]

Instructional Objectives

- Understands linear equations and their graphs
- Solves simple equations
- Solves equations involving algebraic fractions and absolute values
- Solves inequalities
- Solves quadratic equations
- Solves simultaneous equations
- Translates verbal problems into algebraic problems

Sub Topics

3.1   Linear equations and their graphs
3.2   Simple equations
3.3   Equations involving algebraic fractions
3.4   Equations involving absolute values
3.5   Inequalities and their solutions
3.6   Quadratic equations
3.7   Simultaneous equations

4. Fundamentals of Measurements (06 hrs)
[Ref 1: pg 130 – 150, 289 – 302, Ref 2: pg 276 – 290]

Instructional Objectives

- Understands the metric system and converts measurements

- Determines the perimeter, area and volume of geometrical shapes
- Determines heights and distances using angles

Sub Topics

4.1   Measurements of length, mass, capacity, area and volume
4.2   Perimeter, area and volume of basic geometrical shapes
4.3   Pythagoras' theorem
4.4   Introduction to trigonometry

5. Ratios and Proportions (03 hrs)
[Ref 1: pg 24 – 28, Ref 2: pg 95 - 105]

Instructional Objectives

- Understands ratios and proportions
- Solving problems related to ratios and proportions

Sub Topics

5.1   Ratios
5.2   Proportions

6. Percentages (03 hrs)
[Ref 1: pg 29 -34, 47 – 53, Ref 2: 51 - 60]

Instructional Objectives

- Understands percentages
- Solves problems involving percentages
- Solves problems involving interest rates

Sub Topics

6.1   Percentages
6.2   Simple interest and compound interest

7. Fundamentals of Sequences and Series (05 hrs)
[Ref 1: pg 119 – 122]

Instructional Objectives
- Identifies sequences and series
- Recognizes arithmetic progressions and geometric progressions
- Finds the nth term and the sum of the first n terms of an arithmetic progression and a geometric progression using the formulae
- Determines the convergence and divergence of series

Sub Topics

7.1.   Definition and examples of sequences
7.2.   Series and the sequence of terms of a series
7.3.   Arithmetic progressions
7.4.   Geometric progressions
7.5.   The sum to infinity of a series and the convergence and divergence of series