MATH 017 INTRODUCTION TO MATHEMATICS
COURSE OBJECTIVES 2008 - 2009
DR. PADRAIG MCLOUGHLIN

Length of Course:
One semester

Prerequisite:
None

Text (required):
Mathematics All Around, Pirnot (3rd Edition). Pearson, Addison-Wesley.

Texts (supplemental):
The instructor may suggest supplemental reading from a number of sources; including, but not limited to:
The World of Mathematics, Newman (Any edition). Simon and Schuster.
Mathematical Ideas, Miller & Heeren (Any edition). Harper-Collins.
Mathematics: A Practical Odyssey, Johnson & Mowry (Any edition). PWS Kent.
For All Practical Purposes, COMAP (Any edition). Freeman & Co.
*Schaum Outline Series: Basic Mathematics, K*ruglak, Moore, & Mata-Toledo (any edition). McGraw - Hill.

Course Objective:

This General Education introductory-level course is intended to acquaint the student with the nature and spirit of mathematics. Topics include set theory, logic, counting methods, probability, statistics, and algebra-based problem solving with graphical and analytic solutions.

This is a survey course in mathematics which is intended to satisfy Category IV-A requirement of General Education for most students at the university. The course addresses General Education Goal #3: "Students will apply mathematical functions and numeric data interpretation to problem solving."

A student should have mastered and demonstrated the following skills after completing Math 017:

- the student is familiar with the nature and spirit of mathematical development.
- the student has increased his level of understanding of the concepts and processes of mathematics.
- the student demonstrates the ability to solve problems through applications of mathematical concepts and procedures.
- the student is able to engage in both intuitive and deductive reasoning in mathematical situations and realize the role of each in the development of mathematics.
- the student has realised to an appreciation of mathematics and the part it has played and will continue to play in shaping the world in which we live.
- the student is able to think logically
- the student is able to reason and recognise patterns and be able to make conjectures
- the student is able to use mathematical symbols
- the student understands the basic concepts of mathematics
- the student is able to strike a judicious balance between theory and application, between computational skills and mathematical sophistication and between intuition and rigor.
- the student is able to read a proof of a statement.
- the student is able to construct a valid examples of true claims.
- the student is able to construct valid counterexamples to propositions which are false.
- the student is able to recognise and avoid common fallacies in arguments including begging the question, circular reasoning, affirming the conclusion, and denying the hypothesis.

A brief overview of some (but not all of) the Course Content:

A. Sets and Counting
1. Sets and operations
2. Venn diagrams
3. Counting Principle
4. Permutations and Combinations
5. Problem Solving and Applications

B. Logic
1. Syllogistic logic
2. Symbolic logic
3. Truth tables
4. Conditionals
5. Arguments
6. Problem Solving and Applications

C. Probability
1. Introduction to Probability
2. Rules of Probability
3. Conditional Probability
4. Independent Events
5. Combinatorics and Probability
6. Expected Value
7. Problem Solving and Applications

D. Statistics
1. Introduction to Statistics
2. Measures of Central Tendency
3. Measures of Dispersion
4. Normal Distribution
5. Problem Solving and Applications

E. Selected Areas of Application
1. Finance
    a. Simple Interest
    b. Compound Interest
    c. Problem Solving and Applications
2. Equations and Inequalities
    a. Linear Equations
    b. Ratios, Proportions and Variation
    c. Quadratic Equations
    d. Linear Inequalities
    e. Problem Solving and Applications
3. Graphs and Functions
    a. Graphing Linear and Quadratic Functions
    b. Slope
    d. Equation of a Line
    e. Linear Equalities
    f. Problem Solving and Applications

Outline of the Course:			**Suggested Pace:**
I	Preliminaries	Review of Some Basic Concepts and Mathematical Work	1 week
II	Set Theory	Chapter 1 § 1 – 6	2 weeks
III	Logic	Chapter 2 § 1 – 6	2 ½ weeks
IV	Combinatorics	Chapter 12 § 1 – 3	1 ½ weeks
V	Probability Theory	Chapter 13 § 1 – 4	2 weeks
VI	Statistics	Chapter 14 § 1 – 4	2 weeks
VII	Finance	Chapter 11 § 1 – 5	2 weeks
VII	Equations, Inequalities, Graphs, and Functions	(time permitting)	rest of the semestre