MATH 1510 SCIENTIFIC PROGRAMMING

3 Credits
Offered in Lecture Format
Prerequisite required (MATH 1200 or MATH 1700 with a grade of C or better or Appropriate Placement-Test Score)

Revised 11/03/2004

SYLLABUS

I. **INTRODUCTION TO COMPUTING**
- A. Overview of computer technology
- B. Introduction to the Programming Process
  - 1. Problem definition to Pseudocode
  - 2. Source code
  - 3. Compile/Link/Run

II. **PROBLEM DEFINITION TO PSEUDOCODE**
- A. Well-defined problem
- B. Deriving a solution
- C. Algorithm: writing a recipe to implement the solution
- D. Pseudocode: almost a high-level language source code

III. **WRITING THE SOURCE CODE: PART I**
- A. Declaring variables
  - 1. Data types and compatibility
- B. Collecting data: input commands
- C. Using commands and syntax to implement the pseudocode
  - 1. Arithmetic operators
  - 2. Elementary control loops
- D. Displaying results: output commands
  - 1. Formatting data
- E. Documentation: include comments in the code

IV. **RUNNING THE CODE**
- A. Compile/Link/Run
- B. Debugging

V. **WRITING THE SOURCE CODE: PART II**
- A. Using predefined functions
- B. User-defined functions
- C. Local vs. global variables and constants
- D. Advanced techniques for using data in functions
- E. Input/Output via data files

VI. **CONTROL LOGIC AND COMMANDS: MORE APPLICATIONS**
- A. if-else statements
- B. do-while loops
- C. for-statements

VII. **LIBRARIES OF FUNCTIONS**

A. Predefined libraries

B. User defined libraries

VIII. **Arrays**

A. Introduction to arrays

B. Arrays in functions

C. Multidimensional arrays