

Course Number	161
Course Name	Introduction to Computing I
Credits	4
Prerequisite	MA160 (co-requisite)
Course Description	An introduction to the concepts and techniques of computer programming. Emphasis is placed on developing the student's ability to apply problem-solving strategies to design algorithms and to implement these algorithms in a modern, structured programming language. The course includes a laboratory component. This course is currently taught using Java.
Course Objectives	1. Course Outcomes At the end of this course, a student will: A. be able to design a solution to a given problem. B. be able to write a program to implement the solution. C. be able to properly test a program to ensure its correctness and robustness. D. be able to use accepted style when writing a program. E. be able to use a computer system to edit, compile, and execute a program.
Course Outline	Major Topics Covered A. Problem Solving <ol style="list-style-type: none"> 1. Problem analysis 2. Algorithm development 3. Structured programming techniques 4. Testing and debugging 5. Documentation B. Computing at MU <ol style="list-style-type: none"> 1. Hardware and software 2. Using the computer network 3. MU Policy for Responsible Use of Electronic Resources 4. MU Academic Honesty Policy 5. Creating, editing, compiling, and executing a program 6. Debugging C. Programming Language Fundamentals <ol style="list-style-type: none"> 1. Vocabulary <ol style="list-style-type: none"> a. Literals b. Identifiers c. Reserved Words 2. Program structure <ol style="list-style-type: none"> a. Declarations b. Executable statements D. Data Types and Declarations <ol style="list-style-type: none"> 1. Scalar data types <ol style="list-style-type: none"> a. Integer b. Real c. Character d. Boolean e. Strings (concatenation, substring operations) 2. Data Declarations <ol style="list-style-type: none"> a. Variables b. Constants E. Fundamental Operations <ol style="list-style-type: none"> 1. Arithmetic expressions and assignment 2. Input from the keyboard 3. Output to the screen 4. Simple Graphical I/O 5. Boolean Expressions F. Control Statements <ol style="list-style-type: none"> 1. Sequential 2. Loops <ol style="list-style-type: none"> a. Definite

- b. Pre-Test
- c. Post-Test
- 3. Selection
 - a. One Alternative
 - b. Two Alternatives
 - c. Many Alternatives

G. Functions and Methods

- 1. Definition and invocation
- 2. Parameters
- 3. Block structure and scope

H. Additional Data Types

- 1. Enumerated types
- 2. One-dimensional arrays
- 3. Multi-dimensional arrays

I. Sorting and Searching

- 1. Sequential search
- 2. Binary search
- 3. An elementary sort

J. Files

- 1. File I/O
- 2. Scanning input

K. Using Objects

- 1. Declaration and instantiation
- 2. Value and reference types
- 3. Using static and instance methods

Texts

Readings

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