

**INTRODUCTION TO PROGRAMMING**

## PRG 110- Section: [001]

**Credit Hours: 3.00 Lab Hours: 2.00 Lecture Hours: 2.00**

**IAI Core: IAI Majors: PCS: 1.2 Articulated Semester: [Spring 2015] Course Begins: [1/22] Course Ends: [05/14]**

**Days: [Online] Times: [online] Room: [Online]**

**Instructor:** [Jack Brzezinski Ph.D.] **E-mail:** [jbrzezinski@mchenry.edu] **Phone:** [8578]

**Office Hours:** [Tue, 4pm – 6pm or by appointment]

**Office Location:** [D161 or D152]

## Required Course:

**Textbook(s):** [Gaddis, Starting Out with C++]

## Course Description:

Introduction to Programming is a study of fundamental programming. Basic data types, conditional statements, loops, code structuring, documentation, logic and flowcharting techniques are discussed. Structured design concepts common to many programming languages are presented. Students practice hands-on application of those concepts using object-oriented programming language. This course may be repeated once for a maximum of 6 credit hours.

## Course Prerequisite: Students must complete CIS 121, Applied Logic, with a grade of C or higher, or have completed a high school course in programming with a grade of C or higher, or pass the CIS 121 proficiency test. Students must also have completed CIS 110 with a grade of C or higher or be currently enrolled in CIS 110 and must place into MAT 095 or higher.

**Course Objectives:**

Upon completion of this course, the student will be able to:

1. Identify and describe the three programming structures
2. Describe the purpose of programming modules
3. Explain how to code programming statements
4. Define various data types
5. Describe the differences between syntax errors, build errors, logic errors, and run-time errors
6. Describe the purpose of various math operations and functions

7. Demonstrate an understanding of the problem-solving capabilities of a high-level language

1. Explain how files are processed in a high-level language
2. Define array types and explain their uses in a high-level language
3. Explain why there is a need for good documentation
4. Describe from a programmer’s point of view the advantage of structured design over non- structured programming methods
5. Explain the need for good planning prior to coding a program
6. Describe how a computer solves problems, what types of problems are suitable for computers, and the human role in computer applications
7. Create computer programs to solve multiple types of problems

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## Course Outline

1. Overview of Computers and Logic
	1. Developing computer programs
	2. Machine language, assembly language, high level language, and fourth-generation languages
	3. Steps in developing a program
	4. Types of errors
2. Review of Flowcharting and Pseudocode
	1. Flowcharting symbols
	2. How pseudocode may be used to represent program instructions
	3. Character and numeric variables
	4. Assignment statements
3. Understanding Structure
	1. Structured vs. unstructured logic
	2. The three basic programming structures
	3. The priming read
	4. Recognizing structured logic in flowcharts and correcting unstructured logic
4. Decision Making
	1. Evaluating Boolean expressions
	2. Comparison operators
	3. AND and OR logic
	4. Writing AND and OR decisions for efficiency
	5. Nesting decisions
	6. Common errors made in decision logic
5. Introduction to High-Level Programming
	1. Parts of a program
	2. Output objects
	3. Literals
	4. Character, integer, and floating point variables
	5. Arithmetic operators
6. Expressions and Interactivity
	1. Input objects
	2. Math expressions
	3. Type casting
	4. Named constants
	5. Formatting input and output
7. king Decisions in Programming
	1. If statements
	2. If / else statements
	3. Flags
	4. Menus
	5. Logical operators
	6. The conditional operator
8. Looping in Programming
	1. Increment and decrement operators
	2. While loops
	3. Counters
	4. Do while and for loops
	5. Break and continue statements
9. File Operations
	1. Declaring, opening, and closing file objects
	2. Using loops to read from and write to files
10. Functions
	1. Defining and calling functions
	2. Function prototypes
	3. Passing data to functions by value
	4. Returning values from functions
	5. Local and global variables
	6. Passing data to functions by reference
11. Arrays
	1. Accessing array elements
	2. Array declaration and initialization
	3. Processing array contents
	4. Passing arrays to functions
	5. Two- and higher dimensional arrays
	6. Arrays of strings

## Assignments and Grading Criteria

The final grade will be based upon an accumulation of points from tests and application assignments. A tentative breakdown follows:

|  |  |
| --- | --- |
|  | % of the final grade |
| home assignments | 100% |

The grading scale to be used is as follows:

A = 90% of total possible points; B = 80 - 89%; C = 70 - 79%; D = 60 - 69%; E = 0 - 59%

**Late work/make-up policy:** [Special arrangements can be made with the instructor]

## Weekly Course Schedule

Module1: Introduction to C++

Module 2: Programming environment and programming interactive code: Module 3: Interactive programs, file management:

Module 4: Making Decisions: Module 5: Making Decisions cont. Module 6: Loops:

Module 7: Loops continued: Module 8: Functions

Module 9: Arrays and Functions cont: 7

**Withdrawals:** The last day to drop this course is **[see:** [www.mchenry.edu/academiccalendar.asp](http://www.mchenry.edu/academiccalendar.asp) **].** Failure to attend class does not constitute official withdrawal. If students are considering a withdrawal, they should consult directly with the instructor and an academic advisor. Students may withdraw from a class through the Registration Office, either in person or by fax: (815) 455-3766. In their request, students should include their name, student ID number, course prefix, number and section, course title, instructor, reason for withdrawing, and their signature. Withdrawal from a course will not be accepted over the telephone.

Please refer to the following link for other important college dates: [www.mchenry.edu/academiccalendar.asp](http://www.mchenry.edu/academiccalendar.asp)

## General Education Goals:

1. Critical Thinking: To identify, define, analyze, synthesize, interpret, and evaluate ideas.
2. Information Literacy: To locate, evaluate, and use resources effectively.
3. Effective Communication: To develop, articulate, and convey meaning.
4. Ethical Awareness: To identify and make responsible choices in a diverse world.
5. Technological Literacy: To use tools skillfully.

## Assessment:

Some student work may be collected for the purpose of assessment, including student competency in the general education goals, the program, or the course.

## Effective Fall 2014: Student E-Portfolio:

The instructor of the course will designate at least one graded assignment for possible inclusion in the student E-portfolio. Students applying for an AA, AS, AFA, AES, or AGE degree must document their learning outcomes with a graded assignment for each of the five general education goals by the time of graduation. These five assignments and a cover letter will be in the student E-portfolio in Canvas.

## Academic Support for Special Populations Students

McHenry County College offers support services for students with special needs. It is the student's responsibility to meet with the Special Needs Coordinator and provide current documentation regarding his/her disability and receive information about the accommodations that are available.

In addition, as a student enrolled in a career or technical education program at McHenry County College, you may be eligible for services and assistance under the Carl D. Perkins III Grant. Grant funds are used, in part, to assist students who are at risk of not succeeding in their educational pursuits.

The traits that often prevent students from succeeding are: economic disadvantage, academic disadvantage, disability/disabilities, single parent, displaced homemaker, nontraditional, and limited English proficiency (LEP). The definitions of each trait are available in the Special Needs Office.

Students with one or more of these traits are referred to as **Perkins Special Populations Students.**

If you would like to know if you are eligible for services at anytime during the semester, please do not hesitate to contact the Special Needs Coordinator. The office is Room A260, and phone number is (815) 455-8676.

## Academic Integrity

As an educational community, McHenry County College values the pursuit of academic excellence and integrity. In accordance with this philosophy and Chapter 10, Act 5 of the 1994 Illinois Community College Act, academic dishonesty in any form, including cheating, plagiarism, and all other acts of academic theft, is considered intolerable. Appropriate sanctions, up to and including suspension from the College will be imposed by authorized College personnel.

## Copyright Policy

MCC will maintain current procedures and guidelines to ensure that all staff and students comply with applicable copyright laws and other intellectual property protection laws. The College will encourage staff and students to engage in the development of intellectual property and facilitate ownership protections with respect to such development of intellectual property.

The College expects that staff and students will act responsibly and ethically in a manner consistent with all copyright laws and College copyright procedures and guidelines. This policy authorizes the College to adopt and maintain such procedures and guidelines necessary to ensure compliance with copyright laws and to facilitate ownership protection with respect to the development of intellectual property.

## Student Code of Conduct and the Judicial Process

Consistent with the MCC mission is an expectation that students will govern themselves in terms of appropriate behavior with emphasis on self-respect and respect for others. It is the practice of the College to respect the properly exercised rights of its students. The College recognizes a student’s rights within the institution to freedom of speech, inquiry and assembly; to the peaceful pursuit of education; and to the reasonable use of services and facilities at MCC.

MCC has adopted a Student Code of Conduct and judicial process to maintain a learning environment of respect, civility, safety, and integrity for all members of the MCC community.

Whenever possible, sanctions for violations of the Student Code of Conduct may be educational in nature. However, violations affecting the health and safety of members of the MCC community are deemed to be the most serious. Therefore, acts of violence, threats or dangerous behavior are most likely to result in a suspension from the College. Violations of the academic dishonesty policy may also result in suspension or expulsion from the institution and/or reduced or failing grade.

## Children on Campus

For the safety of children on campus, children (i.e., less than 16 years of age) are not permitted on campus unattended by a parent/guardian, except when they are attending classes offered by MCC for children.

The College requires that no children be allowed into a classroom/laboratory environment, including the Testing Center, Learning Center and computer labs, solely for the purpose of a parent/guardian to provide direct supervision of his/her child.

## Teaching Schedule

The scheduling of the activities and teaching strategies on this syllabus, but not the objectives or content, may be altered at any time at the discretion of the instructor.

## Resources

The following are useful resources available to you as a student at McHenry County College:

**Advising and Transfer Center: Phone (815) 479-7565; Office A257** [www.mchenry.edu/atc](http://www.mchenry.edu/ATC/Index.asp)

## Counseling:

**Phone (815) 455-8765; Office A257**

[www.mchenry.edu/counseling](http://www.mchenry.edu/counseling)

## Financial Aid:

**Phone (815) 455-8761; Office A262**

[www.mchenry.edu/financialaid](http://www.mchenry.edu/financialaid)

## Library:

This workforce solution was funded by a grant awarded by the U.S. Department of Labor’s Employment and Training Administration. The solution was created by the grantee and does not necessarily reflect the official position of the U.S. Department of Labor. The Department of Labor makes no guarantees, warranties, or assurances of any kind, express or implied, with respect to such information, including any information on linked sites and including, but not limited to, accuracy of the information or its completeness, timelines, usefulness, adequacy, continued availability, or ownership. This solution is copyrighted by the institution that created it. Internal use, by an organization and/or personal use by an individual for non-commercial purposes, is permissible. All other uses require the prior authorization of the copyright holder.

**Phone (815) 455-8533; Office A212**

[www.mchenry.edu/library](http://www.mchenry.edu/library)

## Special Needs:

**Phone (815) 455-8676; Office A260**

[www.mchenry.edu/specialneeds](http://www.mchenry.edu/specialneeds)

## Tutoring and Study Skills (Sage Learning Center):

**Phone (815) 455-8579; Office A247**

[www.mchenry.edu/sage](http://www.mchenry.edu/sage)