Montgomery County Community College
CIS 111
Computer Science I: Programming and Concepts
3-2-2

COURSE DESCRIPTION:
This course introduces students to fundamental techniques, concepts and vocabulary of procedural programming and computer science. Emphasis is placed on programming in a high-level computer language such as Java or C++. This is the first course for computer majors.

REQUISITES:
- MAT 100 with a "C" or better or equivalent, or placing above (ABV) MAT100 on the mathematics placement test. OR
- CIS 1101 – Programming for Everyone with a “C” or better

Concurrent Course Requirements
None

LEARNING OUTCOMES Upon successful completion of this course, the student will be able to:	LEARNING ACTIVITIES	EVALUATION METHODS
1. Demonstrate a working knowledge of the Java programming language including basic input/output (I/O), decisions, variable, loops, methods, parameter passing, arrays, and strings.	Assigned Readings Lecture Student Discussions and/or Presentations Hands-On Lab Exercises Programming Projects Homework Assignments	Tests or Quizzes Program Portfolio Capstone Project Final Exam
2. Demonstrate effective problem-solving strategies and algorithms in the problem solving process.	Assigned Readings Lecture Student Discussions and/or Presentations Hands-On Lab Exercises Programming Projects Homework Assignments	Tests or Quizzes Program Portfolio Capstone project Final Exam

LEARNING OUTCOMES	LEARNING ACTIVITIES	EVALUATION METHODS
3. Produce well designed and documented programs that are organized in a logical and efficient fashion.	Assigned Readings Lecture Student Discussions and/or Presentations Hands-On Lab Exercises Programming Projects Homework Assignments	Tests or Quizzes Program Portfolio Capstone project Final Exam
4. Apply the basic vocabulary and fundamental concepts of computer science including: a. History of computing and computers b. Evolution of ideas and machines c. Binary numbers and data representation d. The Internet, HTML and Cloud Computing e. Codes of ethics and responsible conduct in computing. f. Computer science professions and the roles of individuals in computer science g. Computer Networking h. Operating System and Application software	Assigned Readings Lecture Discussions and/or Student Presentations Homework Assignments	Tests or Quizzes Graded Discussions or Presentation Assigned Papers Related to these Topics Final Exam

At the conclusion of each semester/session, assessment of the learning outcomes will be completed by course faculty using the listed evaluation method(s). Aggregated results will be submitted to the Associate Vice President of Academic Affairs. The benchmark for each learning outcome is that *70% of students will meet or exceed outcome criteria*.

SEQUENCE OF TOPICS:

1. Computer Literacy
    - History of computing and computers
    - An overview of computer systems and their uses
    - Introduction to networking
    - Basic computer functions and hardware for processing data
        - Input/Output
        - Machine level representation of data (bits, bytes, etc.)

    - Processor operations
    - Storage (volatile and non-volatile)
- Operating Systems and Application Software
    - Role and functions
    - Overview of uses of word processing, spreadsheet,, presentation and database software
    - Open source versus proprietary software
    - A comparison of various high level language
- An overview of the Internet, HTML and Cloud Computing
- Social impact of computers and ethical considerations
    - Responsible conduct
    - Data privacy
    - Software licensing
    - Computing threats
    - Environmental issues related to computing
- Careers in computing

2. Programming
    - Introduction to syntax of programming language being used
    - Algorithms and problem-solving
        - Problem-solving strategies
        - Role of algorithms in the problem-solving process
        - Basic concepts and properties of algorithms
        - Debugging strategies
        - Flowcharting
    - Fundamental programming constructs
        - Variables
        - Data types
        - Expressions
        - Assignment
        - Simple input/output (I/O)
        - File input and output
        - Conditional and iterative control structures
        - Methods
        - Parameter passing
    - Fundamental Data Structures
        - Single dimension arrays
        - Sorting and searching arrays
        - Strings and string processing

LEARNING MATERIALS:

Dale & Lewis. *Computer Science Illuminated* (7th ed.) w/ Navigate2 access code. Jones and Bartlett.
978-1284155617

Gaddis, Tony. *Starting Out w/ Java: From Control Structures through Objects + My Programming Lab, 7th ed.* Pearson. 978-0135188637

Other learning materials may be required and made available directly to the student and/or via the College's Libraries and/or course management system.

Required Topic Coverage
The following topics must be covered:

Java Programming
Chapter 1 – An Overview of Computers and Programming Languages
Chapter 2 – Basic Elements of Java – Defining variables, performing calculations and basic input/output.
Chapter 2 -- Using Predefined methods (such as Math and String) and Java APIs
Chapter 3 – Control Structures I: Selection
Chapter 4 – Control Structures II: Repetition
Chapter 5 – User-Defined Classes and Methods
Chapter 6 – Arrays
Chapter 6 – Array Searching and Sorting
Chapter 7 – File Input and Output

Computer Concepts
Topic 1 – The Big Picture – The History of Computers and types of computers
Topic 2 – Binary Values and Number Systems
Topic 3 – Data Representations
Topic 4 – Gates and Circuits (optional)
Topic 5 – Computing Components (Hardware)
Topic 6 -- Application Software – word processing, spreadsheet, database and presentation
Topic 7 – Operating Systems
Topic 8 – High-Level Programming Languages
Topic 9 – Networks
Topic 10 – The World Wide Web
Topic 11 -- Computer Careers

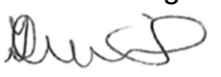
COURSE APPROVAL:
Prepared by: Alan Evans Date: 7/2003
Revised by: Marie Hartlein Date: 3/12/2009
VPAA/Provost Compliance Verification:
Dr. John C. Flynn, Jr. Date: 9/11/2009

Revised by: Marie Hartlein Date: 4/1/2013
VPAA/Provost or designee Compliance Verification:
Victoria L. Bastecki-Perez, Ed.D. Date: 7/11/2013

Revised by: Kathy Kelly and Matthew Krause Date: 12/5/2017
VPAA/Provost or designee Compliance Verification:
Victoria L. Bastecki-Perez, Ed.D. Date: 12/5/2017

Revised by: Jamie Bretz Date: 2/9/2018
VPAA/Provost or designee Compliance Verification:
Victoria L. Bastecki-Perez, Ed.D. Date: 2/9/2018

Revised by: Matthew Krause and Marie Hartlein Date: 1/28/2020
VPAA or designee Compliance Verification: Date: 2/26/2020



This course is consistent with Montgomery County Community College's mission. It was developed, approved and will be delivered in full compliance with the policies and procedures established by the College.