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
        o   Input/Output
        o   Machine level representation of data (bits, bytes, etc.)

- o Processor operations
- o Storage (volatile and non-volatile)

Operating Systems and Application Software
- o Role and functions
- o Overview of uses of word processing, spreadsheet,, presentation and database software
- o Open source versus proprietary software
- o A comparison of various high level language

An overview of the Internet, HTML and Cloud Computing

Social impact of computers and ethical considerations
- o Responsible conduct
- o Data privacy
- o Software licensing
- o Computing threats
- o Environmental issues related to computing

Careers in computing

2.   Programming

Introduction to syntax of programming language being used

Algorithms and problem-solving
- o Problem-solving strategies
- o Role of algorithms in the problem-solving process
- o Basic concepts and properties of algorithms
- o Debugging strategies
- o Flowcharting

Fundamental programming constructs
- o Variables
- o Data types
- o Expressions
- o Assignment
- o Simple input/output (I/O)
- o File input and output
- o Conditional and iterative control structures
- o Methods
- o Parameter passing

Fundamental Data Structures
- o Single dimension arrays
- o Sorting and searching arrays
- o 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

Revised by: Jamie Bretz   Date: 2/9/2018