Montgomery County Community College
CIS 111B
Computer Science II: Object-Oriented Programming
3-2-2

COURSE DESCRIPTION:
This course introduces students to the object-oriented programming paradigm and focuses on the definition and use of classes and the fundamentals of object-oriented design. It is designed for students that already have a firm foundation in procedural programming concepts. A high-level programming language such as Java or C++ is used. This is the second course for computer majors.

PREREQUISITE(S):
CIS 111 - Computer Science I: Programming and Concepts, with "C" or better or equivalent experience in procedural programming techniques

CO-REQUISITE(S):
None

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

LEARNING OUTCOMES	LEARNING ACTIVITIES	EVALUATION METHODS
1. Demonstrate a working knowledge of objects and object-oriented design principles.	Lecture Discussion Student Presentations	Programming projects Homework Assignments Group Projects Quizzes Exams
2. Produce well designed and documented programs that are organized in a logical and efficient fashion.	Lecture Discussion Student Presentations	Programming projects Homework Assignments Group Projects Quizzes Exams
3. Create programs demonstrating mastery of fundamental computing algorithms (such as simple sorts and searching algorithms) to create programs demonstrating mastery of these concepts.	Lecture Discussion Student Presentations	Programming projects Homework Assignments Group Projects Quizzes Exams

LEARNING OUTCOMES	LEARNING ACTIVITIES	EVALUATION METHODS
4. Understand the history and development of programming languages and paradigms.	Lecture Discussion Student Presentations	Programming projects Homework Assignments Group Projects Quizzes Exams Oral presentations
5. Understand the basic concepts surrounding computer language translation.	Lecture Discussion Student Presentations	Programming projects Homework Assignments Group Projects Quizzes Exams Oral presentation
6. Understand the application of computer science concepts to information processing, artificial intelligence, simulation, and games	Lecture Discussion Student Presentations	Programming projects Homework Assignments Group Projects Quizzes Exams Oral presentation

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:
- Review of Control Structures, Methods, and Primitive Data Types
- Object-Oriented Programming Concepts
  o Design
  o Encapsulation and information hiding
  o Separation of behavior and implementation
  o Classes and subclasses
  o Inheritance
  o Polymorphism
  o Class hierarchies
- Search and Sorting Algorithms
  o Linear search
  o Binary search
  o Selection sort
  o Insertion sort
- Fundamentals of Event-Driven Programming
- Graphics API (Introduction)
- Selected Applications from information systems, artificial intelligence, simulation, and games
- History of Programming Languages and Paradigms

- Virtual Machines
  - o Virtual Machines
  - o Intermediate languages
- Introduction to Language Translation
  - o Comparison of interpreters and compilers
  - o Translation phases
  - o Machine-dependent aspects of translation
  - o Machine-independent aspects of translation

LEARNING MATERIALS:

Dale & Lewis. *Computer Science Illuminated* (7th ed.) w/ Navigate2 access code. Jones and Bartlett. 9781284155617

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.

COURSE APPROVAL:

Prepared by: Alan Evans   Date: 3/2003
Revised by: Linda Moulton   Date: 3/2009
VPAA/Provost Compliance Verification: Dr. John C. Flynn, Jr.   Date: 9/11/2009

Revised by: Kendall Martin   Date: 3/2013
VPAA/Provost or designee Compliance Verification:
          Victoria Bastecki-Perez, Ed.D.   Date: 7/11/2013

Revised by: Marie Hartlein   Date: 10/1/2019
VPAA/Provost or designee Compliance Verification: Date: 10/1/2019

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.