Montgomery County Community College
EGR 210
Digital Systems
4-3-3

COURSE DESCRIPTION:
This course introduces the fundamentals of digital systems design. It is designed as a foundation course for those pursuing studies leading to a degree in electrical, electronics, or computer engineering. This course is subject to a course fee. Refer to http://mc3.edu/adm-fin-aid/paying/tuition/course-fees for current rates.

REQUISITES:
Previous Course Requirements
  − EGR 111 Engineering Computations

Concurrent Course Requirements
None

LEARNING OUTCOMES Upon successful completion of this course, the student will be able to:	LEARNING ACTIVITIES	EVALUATION METHODS
1. Apply basic principles of digital theory to design and application.	Lecture Group Problem Solving Activities Computer-Based Laboratory Activities	Section Exam Design of Experiments Review
2. Utilize knowledge of digital devices from basic logic gates through advanced circuits and systems.	Lecture Group Problem Solving Activities Computer-Based Laboratory Activities	Section Exam Design of Experiments Review
3. Apply course-derived knowledge in the design, assembly, and presentation of a digital-based device or system.	Lecture Group Problem Solving Activities Computer-Based Laboratory Activities	Section Exam Design of Experiments Review

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. Introduction to Number Systems and Conversion
2. Boolean Algebra, Algebraic Simplification and Applications
3. Logic Gates
4. Karnaugh Map Theory
5. Multi-Level Gate Networks
6. Multi-output networks
7. Gate-Level Minimization
8. Combinational Network Design
9. Flip Flops and other Synchronous Sequential Logic
10. State Table and Graph Derivations and Reduction
11. Registers and Counters
12. Sequential Network Design
13. Memory and Programmable Logic
14. PLD design Applications
15. State Machine Design

LEARNING MATERIALS:
Textbook:
Digital Design 5th Edition; M. Mano, M. Cilleti; Prentice Hall, 2012; 978-01-32774208

Electronics Workbench software - VHDL/ Verilog

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: W. Brownlowe   Date: 7/26/1998
Revised by: W. Brownlowe   Date: 9/24/2013
VPAA/Provost or designee Compliance Verification:
            Victoria L. Bastecki-Perez, Ed.D.   Date: 9/24/2013

Revised by: W. Brownlowe   Date: 2/2014
VPAA/Provost or designee Compliance Verification:
            Victoria L. Bastecki-Perez, Ed.D.   Date: 2/20/2014

Revised by: W. Brownlowe   Date: 10/22/2014
VPAA/Provost or designee Compliance Verification:
            Victoria L. Bastecki-Perez, Ed.D.   Date: 10/22/2014

Revised by: Gayathri Moorthy, Ph.D.   Date: 12/21/2017
VPAA/Provost or designee Compliance Verification: Date: 1/10/2018

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.