Course number: 04023142
Course name: Digital Electronics
Prerequisites by course: Electronics 1, Digital Logic Circuits
Prerequisites by topic: Students are assumed to have had sufficient background of the following topics: Basic Electronics components, Electric circuits analysis methods, and basic digital logic gates.
Credit hours: 3 hour
Contact hours: 3 hours
Textbook: K.G. Gopalan, Introduction to digital microelectronic circuits, 1st Edition, IRWIN, latest edition
References:

1. Taub and Schilling, Digital Integrated Electronics, McGraw-Hill, latest edition.

2. D. Neaman, Electronic Circuit Analysis and Design, Second Edition, McGraw-Hill, latest edition.

3. R. J. Tocci, Fundamentals Electronics Circuits, of Pulse and Digital Circuits, Prentice-Hall, latest edition.

Course website: ---
Schedule and duration: 16 weeks, 45 lectures, 50 minutes each (including exams).
Minimum student material: class handouts, some instructor keynotes, calculator and access to a personal computer and internet.
Minimum college facilities: library, and computational facilities.
Course objectives: The objectives of this course are:

1.	Ability to analyze and design the logic gates
2.	Ability to analyze and design the comparator circuits
3.	Ability to analyze and design multivibrators circuit
4.	Ability to analyze and design the A/D and D/A converters

Course outcomes and relation to ABET student outcomes: (matrix)
Upon successful completion of the course, a student should be able to:

Course Outcomes	Student Outcomes						
	SO1	SO2	SO3	SO4	SO5	SO6	SO7
Ability to analyze and design the logic gates	*					*	*
Ability to analyze and design the comparator circuits	*					*	
Ability to analyze and design multivibrators circuit	*					*	
Ability to analyze and design the A/D and D/A converters	*					*	

Course topics:

Introduction to diode, BJT and MOSFET circuit as a switch

Diode and BJT logic gates and output stages, analysis and design
PMOS, NMOS and CMOS logic gates, analysis and design
Current and voltage sweep circuits, analysis and design
Bistable, monostable and astable multivibrator circuit analysis and design
Comparator and Schmitt Trigger circuit analysis and applications
A 555 Timer and its applications in the timing circuits application
Analog to digital and digital to analog converters

Computer usage: MatLab Software

Attendance: Class attendance will be taken every class and the university's policies will be enforced in this regard.

Assessments: Exams

Grading policy:

Quizzes and student work	20%
Midterm Exam	30%
Final Exam	50%

Instructors:

Student Outcomes (SOs)

1	An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2	An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3	An ability to communicate effectively with a range of audiences
4	An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5	An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6	An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7	An ability to acquire and apply new knowledge as needed, using appropriate learning strategies