Course number: 04022240 (04082251)
Course name: Electronics I (Electronics)
Prerequisites by course: Electric Circuits I
Prerequisites by topic: Students are assumed to have had sufficient background of the following topics: Electric circuits analysis fundamentals and techniques and Calculus.
Credit hours: 3 hours
Contact hours: 3 hours
Textbook: [Microelectronic Circuits], [A. Sedra and K. Smith], [2017]

1) Donald A. Neamen, Microelectronics; Circuit Analysis and Design, 4th Edition, McGraw-Hill,2010.
2) D. Schilling and Belove; Electronic Circuits, 3d Edition, McGraw-Hill,1989.
3) Bogart; Electronic Devices and Circuits, 1st Edition, Merrill, 1992. Course website:

Schedule and duration: 16 weeks, 48 lectures, 50 minutes each (including exams).
Minimum student material: Textbook, class handouts, some instructor keynotes, calculator and access to a personal computer and internet.
Minimum college facilities: Classroom with whiteboard and projection display facilities, library, and computational facilities.
Course objectives: The objectives of this course are:

1. Understand theory, dc and ac models, and applications of diodes
2. Understand semiconductor fundamentals
3. Understand theory, dc and ac models, and biasing of bipolar junction transistors
4. Understand theory, dc and ac models, and biasing of metal oxide semiconductor field effect transistors

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						
	SO 1	SO 2	SO 3	SO 4	SO 5	SO 6	SO 7
To understand and acquire knowledge about various semiconductor devices.	*					*	
To be able to perform dc analysis of basic biasing electronic circuits	*					*	
To be able to characterize and design basic electronic circuits and applications	*					*	*

Course topics:

– Diodes: Ideal diode, diode characteristics, Diode Models.
– Operation in the reverse breakdown: Zeners.
– Diode applications: rectifiers, Limiting and Clamping
– Physical operation of diode.

– Bipolar Junction Transistors: Physical operation, types, symbols and conventions, transistors characteristics, active and saturation regions,
– Applying the BJT in Amplifier Design
– MOS Field-Effect Transistors: Physical operation of MOSFET, terminal characteristics
– MOSFET Circuits at DC
– Applying the MOSFET in Amplifier Design
– Introduction to Basic Amplifiers Circuits

Computer usage:

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

Assessments: Exams

Grading policy:

Participation	5%
Quizzes	15%
Midterm Exam	30%
Final Exam	50%

Instructors: Dr. Osama Fares email: osama.fares@iu.edu.jo

Class time and location: Sunday, Tuesday, and Thursday: 11:00 – 11:50 pm

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