

Course number: 04023141

Course name: Electronics Lab

Prerequisites by course: Electronics 2 (corequisite)

Prerequisites by topic: Students are assumed to have had sufficient background of the following topics: op amps, electronic circuits, electric circuits analysis, wiring and debugging.

Credit hours: 1 hour

Contact hours: 3 hours

Textbook: Lab manual

References:

1. Sedra and Smith, Microelectronic circuits, Oxford press, latest edition

Course website: ---

Schedule and duration: 16 weeks, 16 Labs, 170 minutes each (including exams).

Minimum student material: class handouts, some instructor keynotes, calculator and access to a personal computer and internet.

Minimum college facilities: digital electronics lab., library, and computational facilities.

Course objectives: The objectives of this course are:

1.	To improve the practical skills about electronic circuit connection
2.	Examine the characteristics of silicon diode, BJT, and MOSFET practically
3.	To be able to implement and examine diode, BJT, and MOSFET applications
4.	To be able to convert AC voltage into Dc voltage using rectifiers and perform regulation using Zener diodes

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
To improve the practical skills about electronic circuit connection	*						
Examine the characteristics of silicon diode practically	*	*					
To be able to implement and examine diode applications	*	*					
To be able to convert AC voltage into Dc voltage using rectifiers and perform regulation using Zener diodes	*	*				*	
To become experienced about different BJT biasing designs, DC load line determination and optimum Q-point selection		*				*	

Course topics:

The Diode & The Diode Clipper
Diode Rectifier Circuits & Capacitor Input Rectifier Circuits

The Diode Clamper & The Diode Voltage Doubler
The Zener Diode & Voltage Regulation
Transistor Base Biasing & Transistor Emitter Biasing
Transistor Voltage Divider-Biasing & Transistor Collector-Feedback Biasing
The JFET Drain Curve, the JFET Transfer Characteristic Curve and JFET Self-Bias
Inverting and Non-inverting Op-Amp, Slew Rate and Common-Mode Rejection
Op-Amp Differentiator and Integrator and the Phase-Shift oscillator

Computer usage: Pspice Software

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

Assessments: Exams, lab reports

Grading policy:

Reports 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