EC 237 Electronics Engineering

C O U R S E I N F O R M A T I O N

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Lab.	
EE 231			2	2	2	3

C O U R S E A I M

Introducing different electronic devices used in constructing modern electronic circuits: diodes – bipolar junction transistor and field effect transistor. Studying their performance with special emphasis on some practical applications.

Studying semiconductor materials, p-n junction diodes, diode as a circuit element, special diodes, Bipolar Junction Transistor (BJT) and Field Effect Transistor (FET), Sinusoidal and Square-Wave Oscillators.

C O U R S E W E E K L Y C O N T E N T S

1	Types of solids: conductor, insulator, semiconductor.
2	Conduction and energy bands, Semiconductor types – Doping of semiconductors – Mobility and conductivity in semiconductors
3	p-n junction diode - Forward and reverse bias - Diode as a circuit element
4	p-n junction diode - Diode as a circuit element.
5	Half wave and full wave rectifier - Smoothing circuits - Clipping circuits - Clamping circuits.
6	Special diodes: Zener diodes - Light emitting diodes (LEDs) – Photodiodes - Varactor diodes - Solar cells.
7	Bipolar Junction Transistor (BJT): construction – types – symbol - energy band diagram – operation - dc equivalent circuit. + Midterm Exam
8	BJT: dc solution and biasing circuits - bias stability.
9	BJT: Small signal analysis – ac equivalent circuit – Transistor amplifier - Voltage and current gains.
10	Metal oxide semiconductor FET: MOSFET: construction – symbol – operation.
11	I-V Characteristics of MOSFET, Enhancement and depletion modes, dc solution and biasing circuits.
12	E-MOSFET: construction, operation and I-V characteristics - ac solution.
13	Complementary MOSFET (CMOS): symbol - operation - Logic gates using CMOS.
14	Sinusoidal oscillators.
15	Square wave oscillators

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	20 Midterm	← 10 MARKS To be freely distributed among possible assessments →					30
8 to 12	←		20 MARKS			→	20
13 to 15	←		10 MARKS			→	10
16 or 17	40 Final						40
Total	Exams	Assign.	Quizzes	Reports	Present.	Lab.	100

REFERENCES

Textbook	Boylestad, Nashelsky,"Electronic Devices and Circuit Theory",2001.
Other	B.Streetman & S.Banerjee,"Solid State Electronic Devices ", Prentice Hall 2000.