Course Title: **Introduction To Discrete Devices And Circuits**										
Semester	I/II	Teaching Scheme				Evaluation Scheme				
						Theory			Practical	
Term	Odd/Even	Th	Tu	Pr	Credits	TAE	CAE	ESE	INT	EXT
Course Category	C	2 Hrs.	-	2 Hrs.	3	10	15	50	25	-
Course Code	UECL105 UECP105									
Teaching Mode	Offline	4 Hrs.			Total	75			25	
Duration of ESE	2 Hrs.					100				

Course Objectives	To give understanding on how current flows through the p-n junction and relating this phenomena to the characteristics and operation of the diodes, bipolar and field-effect transistors.
	To expose students to the function and application of the diodes, bipolar junction and field effect transistors in electronic circuits.
	To use appropriate experimentation techniques to evaluate circuit performance.
Course Outcomes	Up on successful completion of this course, student will be able to:
	CO1: Relate operation of diodes, types of diodes and their role in design of simple electronic applications.
	CO2: Develop the capability to analyze and design simple circuits containing non-linear elements such as transistors using the concepts of load lines, operating points for various biasing methods.
	CO3: Classify Power amplifiers, Oscillators & Display Devices
	CO4: Interpret the operation of the Field Effect Transistor (FET), Metal Oxide Semiconductor Field Effect Transistor (MOSFET) and design FET circuits
	CO5: Demonstrate familiarity with basic electronic components and use them to design simple electronic circuits

Mapping of Course Outcomes with Program Outcomes:

Course Outcomes	Program Outcomes											
	PO 1	PO2	PO 3	PO4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
CO1	3	2	3	3	3	2	1	1	1	1	2	3
CO2	3	3	3	3	3	2	1	1	1	1	2	3
CO3	3	3	3	3	3	2	1	1	1	1	2	3
CO4	3	3	3	3	3	1	1	1	1	1	2	3
CO5	3	3	3	3	3	1	1	1	1	1	2	3

Course Contents:

Unit	Contents	Hours
I	**Semiconductor Devices:** PN junction diode review, Half and full wave rectifiers, Zener Diode, Varactor Diode, Tunnel Diodes, Clippers and Clampers circuits	6
II	**BJT Transistors-** structure, Operations & characteristics, voltages and currents equations, CE, CB, CC configurations, Early Effect	6
III	**BJT Circuits** DC load line, Biasing circuits, Stability factor, thermal runaway, Compensation methods, h-parameters, Feedback Amplifiers,	6
IV	**Field Effect Transistor:** FETs – Drain and Transfer characteristics,-Current equations-Pinch off voltage and its significance, MOSFETs,	6
V	**Active and Passive sensors:** Temperature, humidity, light sensors, Piezo electrical Transducers, Relay	6

Text Books	1.	Electronics Devices and Circuits, S. Salivahanan, N Suresh Kumar, Tata McGraw-Hill 2008, Third Edition
	2.	Integrated Electronics Jacob MillmanTata McGraw-Hill, 2009, Second Edition
	3.	Electronics devices and Circuits and Theory Robert L. Boylestad, Louis Nashelsky, Pearson India, 2009, Tenth Edition
E--Books	1.	Electronics Devices and Circuits, S. Salivahanan
	2.	Solid State Electronic Devices, 6th Edition, Ben G.Streetman & Sanjiv Kumar Banerjee
Reference Books	1.	Electronic Devices & Circuits, Sanjiv Gupta
	2.	Microelectronics Circuits A. S. Sedra & K. C. Smith, Oxford University Press, 2013, Seventh Edition
	3.	Electronics Devices and Circuits, Nagrath I J Phi Learning Pvt Ltd, 2009, Third Edition.

on line TL Material	1.	Virtual Lab, Electronic Devices & Circuits, IIT Bombay http://vlabs.iitb.ac.in/vlab/electrical/index.html

*: Every practical will be performed on Bread Board

Sr. No.	Name of Experiments / Mini Projects/ Case Studies
0	Study of different electronic components
1	Observe and draw V-I Characteristics of PN Diode & LED Diode.
2	Observe and draw the V-I characteristics and Regulation characteristics of a Zener diode.
3	Design Clipper circuit using Diode.
4	Design Clamper circuit using Diode.
5	Obtain ripple factor of Half Wave/Full wave Rectifier circuit with & without filter
6	Draw the input and output characteristics of transistor connected in CE/CB/CC any one Configuration
7	Design bipolar junction transistor as a switch
8	Design Audio oscillator using BJT
9	Design Radio Oscillator using BJT
10	Design Oscillator for Laptop.
11	Draw the Drain and Transfer characteristics of a given FET in CS Configuration.
12	Draw the Drain and Transfer characteristics of a given MOSFET in CS Configuration.
	Open Ended Experiments
1	Design of Class B push pull power amplifier and observe cross over distortion.
2	Design Zener regulator circuits for Processor Motherboard.
3	Design of Simple analog application circuits.