Electronic Devices and Basic Circuits

CourseCode	**23EC5401**	**Year**	II	**Semester**	II
CourseCategory	Minors	**Branch**	ECE	**CourseType**	Theory
Credits	3	**L-T-P**	3-0-0	**Prerequisites**	-
Continuous Internal Evaluation	30	**SemesterEnd Evaluation**	70	**TotalMarks**	100

CourseOutcomes		
Uponsuccessfulcompletionofthecourse,thestudentwillbeableto		
CO1	Describethebasicconcepts ofdifferenttypesofsemiconductordevices.	L2
CO2	Applydifferent circuitanalysis methods tosolvetheproblems on rectifiercircuits.	L3
CO3	Applycircuitanalysistechniquestofindsolutionstoamplifier and oscillatorcircuits	L3
CO4	Applyconcepts of BJTs and FETs for different circuits.	L3

COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PSO1**	**PSO2**
CO1	2									2	2	1	1
CO2	3									2	2	1	1
CO3	3									2	2	1	1
CO4	3									2	2	1	1
Avg.	3									2	2	1	1

Syllabus		
Unit No.	**Contents**	**Mapped CO**
1	**Junction Diode Characteristics:** PN junction Diode, Open circuitedp-n junction, Biased p-n junction, current components in p-n junction Diode, Diode equation, V-I Characteristics, temperature dependence on V-I characteristics. **Special Semiconductor Devices**: Zener diode, Varactor Diode	CO1,CO2
2	**Diode Circuits:** The Diode as a circuit element, clipping circuits, clamping circuits, half-wave and full-wave rectifier without filter and with inductor filter, capacitor filter, comparison of filter circuits in terms of ripple factors.	CO1,CO2
3	**Transistor Characteristics and Amplifiers:** Junction transistor, transistor current components, transistor configuration: Common Base, Common Emitter and Common Collector configurations.transistor as an amplifier.	CO1,CO2, CO3
4	**Oscillators:** Basic principles of sinusoidal oscillators (Phase shift and Wien bridge oscillators) **Operational Amplifiers**: IC741 pin diagram, characteristics of ideal op amp, inverting and non- inverting configurations. **IC Timers:** Introduction, IC555 timer pin Diagram.	CO1, CO2, CO3

5	**FET:** Types of JFET structure, operation, characteristics, comparison of BJT and FET. MOSFET types- and characteristics. Comparison of JFET and MOSFET.	CO1,CO2, CO3, CO4

Learning Resources
TextBooks
1. J.Millman, C.C.Halkias andSatyabrataJit, Millman's Electronic Devices and Circuits, Mc-Graw Hill Education, 4th edition, 2015. 2. D Roy Choudhury, Shail B. Jain, Linear Integrated Circuits, New Age International, 2003.
ReferenceBooks
1. J.Millman,C.Halkias,andCh.D.Parikh,Millman"sIntegratedElectronics,Mc-Graw Hill Education, 2nd Edition, 2009. 2. RobertL.BoylestadandLouisNashelsky,ElectronicDevicesandCircuitsTheory Pearson/PrenticeHall, 10th Edition, 2009. 3. SedraA.S.andK.C.Smith,MicroelectronicCircuits,OxfordUniversityPress,6th Edition, 2011. 4. BalbirKumarandShailB.Jain,ElectronicDevicesandCircuits,PHI,2007.
e-Resources&otherDigitalMaterial
1. https://onlinecourses.swayam2.ac.in/nou23_ec06/preview 2. https://onlinecourses.nptel.ac.in/noc21_ee80/preview 3. https://onlinecourses.nptel.ac.in/noc21_ee80/preview 4. https://ocw.mit.edu/courses/6-002-circuits-and-electronics-spring-2007/