B.Tech,	1	Semester	1/2	Teaching Scheme				Evaluation Scheme	
Subject Name	Applied Electronics			**L**	**T**	**P**	**Credits**	**CCE**	**SEE**
Subject Code	BTEC22101			3	0	0	3	50	50
Type of course	Engineering Science Course			CCE : Continuous and Comprehensive Evaluation SEE : Semester End Evaluation					
Prerequisite	Basic knowledge of semiconductor material								
Rationale	Electronics is playing a key role in all engineering applications. All engineers should have basic knowledge of electronics. The purpose of this subject is to familiarize students with basic electronics concepts.								

Course Outcomes (COs): At the end of the course, students will be able to		**Marks % Weightage**
CO – 1	Implement and analyze various diode applications.	20
CO – 2	Describe various circuit configurations for transistor and their applications in the field of electronics.	20
CO – 3	Design and implement various comparators and amplifiers using op-amp	20
CO – 4	Apply the knowledge of digital number systems, Boolean algebra, and logic gates for logic function minimization and analyze various digital circuits.	20
CO – 5	Describe parameters and working of voltage regulators.	10
CO – 6	Explain the working of communication systems.	10

Course Contents

Unit	Content	Tentative Teaching Hours	Tentative Unit Weightage %
1	**Junction diode and applications:** Introduction, V-I characteristic of diode, ideal diode, real diode. Rectifier, wave shaping circuits: clipper, clamper. **Special purpose diodes:** zener diode, varactor diode, photo diode, light emitting diode (led), seven segment display, and their applications.	8	20
2	**Transistors: Bipolar Junction Transistors:** Transistor terminals, actions, biasing, current components, current amplification factors, transistor circuit configurations, transistor characteristic, comparison of characteristic of transistors in CE, CB and CC, transistor as an amplifier. **Field Effect Transistors:** Introduction, junction FET, characteristic of JFET. **MOSFET:** D-MOSFET, E-MOSFET , MOSFET as switch.	9	20
3	**Operational Amplifier:** Introduction and block diagram to op-amp. Schematic symbol, ideal op-amp, equivalent circuit, parameters. Open	8	20

	loop op-amp configurations, closed loop op-amp configurations, Summing, Scaling, averaging amplifier.		
4	**Digital Electronics :** Number system and codes, logic system and gates, universal gates, Boolean algebra laws and rules, Karnaugh map, adders, multiplexers, decoders, flip-flops, and asynchronous counters.	10	20
5	**Regulated and Switching Power Supplies:** Introduction, power supply characteristics: load regulation, minimum load resistance, line regulation, and voltage regulators. Three terminal IC Voltage Regulator ,Dual voltage supplies, Switch mode power supplies.	4	10
6	**Introduction to modern communication system :** Introduction to communication system block, general principles of transmission and reception. Modulation: Amplitude modulation, frequency modulation, phase modulation, pulse-code modulation (PCM). Comparison of 2G, 3G, 4G, and 5G	6	10

Suggested Specification table with Marks

% Distribution of Marks					
R Level	**U Level**	**A Level**	**N Level**	**E Level**	**C Level**
30	40	20	10	0	0

Legends: R: Remembrance, **U:** Understanding; **A:** Application, **N:** Analyze, **E:** Evaluate **C:** Create and above Levels **(Revised Bloom's Taxonomy)**

Recommended Reference Books

1 J B Gupta, Electronic Devices and Circuits, 6th edition, 2016
2 V.K.Mehta, Principles of Electronics, 12th edition, 2020
3 Sanjay Sharma, Communication Systems, 2nd edition, 2010
4 Robert Boylstad Louis Nasheslsky, Electronic Devices And Circuit Theory, 10th edition, 2009

CO-PO-Mapping

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
CO – 1	3	2	-	1	3	2	-	-	-	-	-	2
CO – 2	3	2	3	1	2	2	-	-	-	-	-	2
CO – 3	3	2	3	2	3	2	-	-	-	-	-	2
CO – 4	3	3	3	2	3	2	-	-	-	1	-	2
CO – 5	3	1	2	1	3	1	-	-	-	-	-	2
CO – 6	3	2	-	1	3	2	-	-	-	-	-	2

List of Open Source/learning website/Other Details if any:

- https://nptel.ac.in/courses/108/101/108101091/
  Diode circuits, bjt amplifiers, op amp circuits, digital circuits
- https://nptel.ac.in/noc/courses/noc21/sem1/noc21-ee55/

Diode circuits, bjt amplifiers, op amp circuits will be covered. In the digital part, combinatorial and sequential circuits will be covered

- http://www.infocobuild.com/education/audio-video-courses/electronics/basicelectronics-patil-iit-bombay/
  Transistor, digital basics
- https://nptel.ac.in/courses/117/105/117105143/
  Modulation, AM, FM
- https://nptel.ac.in/courses/108/105/108105102/
  Microcontroller and interfacing
- http://hecoep.vlabs.ac.in/list%20of%20experiments.html?domain=electronicsandcommunications
  Virtual lab for hybrid electronics
- http://cse15-iiith.vlabs.ac.in/list%20of%20experiments.html?domain=computer%20science
  Virtual lab for digital electronics

List of open source software:

- LT spice, tinkercad, multisim