B.Tech	1	Semester	1/2	Teaching Scheme				Evaluation Scheme	
Subject Name	Applied Electronics Laboratory			**L**	**T**	**P**	**Credits**	**CCE**	**SEE**
Subject Code	BTEC22102			0	0	2	1	25	25
Type of course	Engineering Science			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	Recognize and explain different electronic components and measuring instruments, demonstrating their role and functionality in electronic circuits.	15
CO – 2	Examine and implement the behaviour of semiconductor diodes and utilize them in rectifier and wave-shaping circuits for practical applications.	30
CO – 3	Design and assess transistor-based amplifier circuits, analyzing their configurations and operational characteristics.	15
CO – 4	Develop and validate operational amplifier circuits, including inverting, non-inverting, summing, scaling averaging amplifiers and comparator applications.	20
CO – 5	Construct and test digital circuits using fundamental logic gates, and implement adders, multiplexers, and decoders for combinational logic design.	20

List of Laboratory Practical

1. a) Study of different basic Electrical/Electronic components like resistor, capacitor, inductor, potentiometer, Diode, LED, Zener Diode, Transistor, IC etc.
   b) Study and measurement of different devices like CRO, Function Generator, Power Supply, Digital multi-meter etc.
2. To study and implement the forward and reverse characteristics of a P-N junction diode. Find the forward resistance.
3. To implement Half Wave Rectifier and to calculate ripple factor and efficiency with filter and without filter.
4. To implement the Full Wave Bridge Rectifier and to calculate ripple factor and efficiency with filter and without filter.
5. To implement and draw reverse characteristics of a Zener diode and to study Zener diode as a voltage regulator for (a) Supply Voltage regulation and (b) Load voltage regulation.
6. To study and implement clipper circuits using diode.
7. To study and implement clamper circuit using diode.
8. To design and implement ZCD, PLD and NLD using Op-Amp.
9. To design circuit for CE transistor characteristic.
10. To design and implement CE transistor configuration as switch.

11. To design and implement CE transistor configuration as an amplifier.
12. To study and implement Inverting and Non Inverting amplifiers using Op-Amp.
13. To study and implement Summing, scaling, averaging using Op-Amp.
14. Verification and interpretation of truth tables for AND, OR, NOT, NAND, NOR, Exclusive OR (EX-OR), Exclusive NOR (EX-NOR) Gates.
15. Design and implement half and full adder.
16. Implement and configure 8x1 multiplexer using 4x1 multiplexer circuits.
17. Implement and configure full adder using decoder circuits.

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)**

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	-	-	-	-	1	-	2
CO – 2	3	3	2	2	3	-	-	-	-	1	-	2
CO – 3	3	3	3	2	3	-	-	-	-	-	-	2
CO – 4	3	2	3	3	3	-	-	-	-	-	-	2
CO – 5	3	3	3	2	3	-	-	-	-	1	-	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