## Course Outcomes (COs)

*At the end of this course, the student should be able to:*

| | | No. of Contact Hours | Marks |
|---|---|---|---|
| CO1: | Draw the characteristics of various electronic devices and analyze simple circuit applications using them | 7 | 22 |
| CO2: | Describe the working of rectifier, voltage regulator and R-C coupled amplifier | 4 | 12 |
| CO3: | Explain the concept of Op-Amp and its basic applications using suitable circuits | 5 | 16 |
| CO4: | Simplify Boolean expressions and implement simple digital circuits using logic gates | 10 | 28 |
| CO5: | Describe the principles of analog and digital communication | 10 | 22 |
| | **Total** | **36** | **100** |

## Course Plan

| L/T Sl No. | Topics |
|---|---|
| L1. | Introduction to Basic Electronics. |
| L2. | Discussion of Junction Diode and V-I characteristics, equivalent Circuit. |
| L3. | Breakdown phenomenon in diodes, Zener diode, Diode as a capacitor. |
| L4. | Discussion of half wave rectifier and full wave rectifier. |
| L5. | Discussion of bridge rectifier, Capacitor filters. |
| L6. | Zener Regulator and regulated power supply. |
| L7. | Discussion of BJT operation and Characteristics and regions of operation. |
| L8. | BJT biasing: fixed biasing, voltage divider biasing. |
| L9. | Self-biasing. |
| L10. | DC load line and operating point, Discussion of RC coupled Amplifier. |
| L11. | Frequency response of with and without feedback, Transistor as a Switch. |
| L12. | Block Diagram and characteristics of Operational Amplifier (Op-Amp). |
| L13. | Inverting amplifier, non- inverting amplifier, difference amplifier. |

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| L14. | Op-Amp based Adder & Subtractor. |
| L15. | Op-Amp based integrator and Differentiator. |
| L16. | Op-Amp based Comparator and Square wave generator. |
| L17. | Discussion of Number systems: Decimal, binary, octal and Hexadecimal number systems. |
| L18. | One's and two's complements. Weighted and non-weighted codes. |
| L19. | Self-complimenting codes, error detecting and correcting codes. |
| L20. | Boolean algebraic theorems and simplification of Boolean expressions. |
| L21. | Logic gates: OR, NOT, AND, NOR , NAND , XOR and XNOR. Concept of Universal Logic. |
| L22. | Implementation of Boolean expressions using logic gates. |
| L23. | Standard form of Boolean expression, POS and SOP forms. |
| L24. | Simplification of Boolean expressions using K-map. |
| L25. | Discussion of SR flip flop, JK flip flop, D-flip flop and T flip flops. |
| L26. | Applications of flip flops. Simple binary counters and shift registers. |
| L27. | Introduction to communication and discussion of Amplitude modulation. |
| L28. | Different types of AM and Detection of AM signal. |
| L29. | Super heterodyne principle of reception of AM signal. |
| L30. | Frequency modulation and Comparison of AM and FM. |
| L31. | Basic principle of Sampling and digitization. Block schematic of general digital communication system. |
| L32. | Qualitative discussion of Pulse modulation schemes - PAM, PPM and PWM. |
| L33. | Qualitative discussion of basic digital modulation schemes – Ask, PSK and FSK. |
| L34. | Data communication and communication networks, types of communication networks. |
| L35. | Network topology, Network protocols and Reference models. |
| L36. | Principle of Cellular mobile communication and Architecture of GSM |

**Reference:**


1. Albert P Malvino, David J Bates – Electronic Principles,7th edition, TMH,2007
2. Robert L. Boylsted, Louis Nashelsky, Electronic Devices & Circuit Theory, 11th Edition, PHI, 2012
3. Malvino and Leach, Digital Principles & applications, 7th edition, TMH, 2010
4. Morris Mano, "Digital design", Prentice Hall of India, Third Edition.

5. George Kennedy, Bernard Davis, Electronic Communication Systems, 4th Edition, MH, 2004
6. Dennis Roddy & John Coolen , "Electronic Communications" ,4th edition, Pearson Education,2009
7. Garcia and Widjaja, "Communication Networks", McGraw Hill, 2006

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