

Basic Electronics Engineering		
Course Frame Work		
Credits: L-T-P: 3- 0 -0		Total Credits: 3
Contact Hours/Week: 4	Direct Teaching Hours: 45	Total Contact Hours: 45
Course Learning Objectives: This course will enable the students to <ul style="list-style-type: none"> • Understand the basic electronics components and its working • Learn the components used in construction of transformer, power supply and oscillator • Understand the principle behind operational amplifier and its applications. • Interpret the use of Boolean algebra, axioms, function in different forms and its various reduction techniques. • learning the logic of basic digital circuits and its implementation in various applications. 		
Course Outcomes: On completion of the course, student would be able to:		
COs	Course outcomes	RBT
C01	Relate the application of basic electronic components in real life	L1
C02	Illustrate the components and working of power supply units	L2
C03	Show the importance of operational amplifier with real time applications	L2
C04	List the various Boolean algebraic axioms, function with reducing techniques	L1
C05	Relate the Boolean algorithm in digital logic gates and circuits	L2
Syllabus		
Module-1		09
BASIC ELECTRONIC COMPONENTS: Resistor, Capacitor, Inductor – Electronic color codes - Diode and its types, Introduction to Transistors, Bipolar Transistors – Types, IV Characteristics, JFET, MOSFET, SCR – Types, IV Characteristics-Applications.		
Module – 2		09
POWER SUPPLY, TRANSFORMER AND OSCILLATORS: Power Supplies – Block diagram, Half-wave rectifier, Full-wave rectifiers and filters, Voltage regulators, Output resistance and voltage regulation, Voltage multipliers. Working of Transformer, Sinusoidal Oscillators, Barkhausen criterion, LC and RC Oscillator – Construction and Working.		

Module – 3	09
OPERATIONAL AMPLIFIER: Introduction of an Inverting Amplifier-Non-Inverting Amplifier- Basic Application of Operation Amplifier: Subtractor- Summing Amplifier-Low Pass Filter- First Order Low Pass Filter- First Order High Pass Filter- Integrator-Differentiator- Analog to digital converter (ADC), Digital to Analog converter (DAC), Applications.	
Module-4	09
BOOLEAN ALGEBRA: Binary numbers, Number Base Conversion, Decimal, Octal & Hexadecimal Numbers, Complements, Basic definitions, Axiomatic Definition of Boolean Algebra, Basic Theorems and Properties of Boolean Algebra, Boolean Functions, Canonical and Standard Forms, K-Map (without don't care).	
Module-5	09
DIGITAL LOGIC CIRCUITS: Digital Logic Gates, Combinational logic: Introduction, Design procedure, Adders- Half adder, Full adder, Subtractor – Half subtractor and Full subtractor, Multiplexer and Demultiplexer.	
<p>Text Books:</p> <ol style="list-style-type: none"> 1. Mike Tooley, 'Electronic Circuits, Fundamentals & Applications', 4th Edition, Elsevier, 2015. 2. David A. Bell, "Electronic devices and circuits", Oxford University higher education, 5th edition 2008. 3. James W. Bignel, Digital Electronics, Cengage learning, 5th Edition, 2007 <p>Reference Books:</p> <ol style="list-style-type: none"> 4. Balbir Kumar, Shail.B.Jain, "Electronic devices and circuits" PHI learning private limited, 2nd edition 2014. 5. Donald A Neamen, "Electronic Circuit Analysis and Design" Tata McGraw Hill, 3rd Edition, 2003. 6. D.P.Kothari,J.S.Dhillon, 'Digital circuits and Design',Pearson Education, 2016. <p>e-Material:</p> <p>Web links and Video Lectures (e-Resources):</p> <p>https://nptelvideos.com/course.php?id=524</p> <p>DOI https://doi.org/10.4324/9781315737980. eBook ISBN9781315737980</p> <p>Activity Based Learning/Practical Based Learning</p> <p>http://nptel.ac.in</p>	

https://swayam.gov.in
https://www.vlab.co.in/participating-institute-amrita-vishwa-vidyapeetham

Beyond the syllabus: Experimenting the circuits and its output in online circuit platform called CircuitLab