VEER NARMAD SOUTH GUJARAT UNIVERSITY

B.E.-I (Electronics & Communication Engg.)

Semester – I, II

Basics of Electronics Engineering
B E I (Electronics and Communication Engineering)

	Lecture	Tutorial	Practical
Teaching Hours	**3**	**0**	**2**
Examination Scheme Marks Credit : 3 (Theory) + 1 (Practical) = 4	**100**	**-**	**Cont. Evaluation : 20 Examination : 30**

1	Theory of PN Junction diode: P and N type semiconductor material, Mobility and conductivity, Diffusion, Generation and recombination of charges, Injected Minority Charge carriers, Mass action law, p –n junction diode, Biasing the diode, V- I Characteristics of diode, Transition and diffusion capacitance of diode.	3 Hours
2	Various types of diode: Working Principle and application of various types of diode like Light Emitting diode, Photo diode, tunnel diode, Zener diode, PIN Diode, Schottky diode, Point contact diode.	3 Hours
3	Diode Circuits: Rectifiers Half wave, full wave rectifier, Bridge rectifier; comparison of Rectifiers, Types of filters, Capacitive filter (C), Inductor filter (L), L.C. filter, PI filter; Analysis of filter and calculation of ripple factor, Diode application in Clipper and Clampers, Zener diode as a voltage regulator.	8 Hours
4	Bipolar Junction transistor: Principle of operation of junction transistor, current component in a transistor, VI Characteristics of CB, CC and CE configuration.	4 Hours
5	Transistor Biasing: Load line and Operating point, Transistor as an amplifier, Different dc biasing methods, fixed bias, potential divider bias, Quiescent point variation due to uncertainty parameters like Beta, temperature, Bias Stability, Stability factors.	4 Hours
6	Field Effect Transistor FET: Structure of FET, Drain and transfer characteristics of JFET, Comparison of FET and BJT, Structure of MOSFET, Enhancement and depletion type MOSFET, Drain and transfer characteristics of an enhancement MOSFET,FET Biasing methods.	4 Hours
7	Power Electronics Devices: Construction and characteristics of Silicon Controller Rectifier; Two transistor analogy for SCR, Principle of operation and characteristics of TRIAC and DIAC, UJT and Applications	4 Hours
8	Number Systems: Decimal number system; Binary, octal and hexadecimal number systems; Conversion from one number to another number system; Addition, subtraction, multiplication and division using different number systems,	3 Hours

9	Logic Gates and Boolean algebra AND, OR, NOT, NAND, NOR, Ex-OR logic gates; Positive and negative logic, Fundamental concepts of Boolean algebra, Demorgan's laws, Principles of duality, Simplification of Boolean expressions, Canonical and standard forms for Boolean functions, Karnaugh map representation of Logical Functions.	6 Hours
10-	Combinational Logic Circuits Using Discrete Logic Gates: Half adder, full adder, half subtractor, full subtractor, Multiplexer, de multiplexer, Encoder, Decoder	3 Hours

Text:

[1] Electronics Devices and Circuits, Dharma Raj Cheruku and Battula Tirumala Krishna, Pearson Education, First Indian reprint 2005.
[2] Electronics Devices and Circuits, S Salivahanan, N Suresh Kumar, A Vallavaraj, Tata McGraw Hill, 1998.
[3] Electronics Devices and Circuits, Sanjeev Gupta, Dhanpat Rai Publications, Reprint 2003.

References

[4] Electronic Devices, Thomas L.Floyd, 6/e Low Price Edition, Pearson Education Third Indian Reprint 2004
[5] Electronics Devices and Circuit Theory, Robert Boylestad and Louis Nashelsky, 6/e, PHI, 1998
[6] Electronic Devices and Circuits, J B Gupta, S K Kataria and Sons, New Delhi 2/e Reprint 2004-2005

Practical should be based on curriculum specified above and according to guidelines given below.

- Characteristics of devices like Diode, BJT, MOSFET, Zener diode, UJT, photodiode, LED, SCR etc.
- Application of above devices like rectifier using diodes, BJT and FET biasing and their use as an amplifier, Zener diode as an voltage regulator, Power control using SCR, photodiode and LED applications,
- Logic verification of basic gates like NAND, NOR, NOT , XOR gates, Combinational logic circuits like half adder and full adder, Boolean function implementation.