

Course Number and Name												
BEE303 & Electron Devices												
Credits and Contact Hours												
3 & 45												
Course Coordinator's Name												
Mr.Vijayaragavan												
Text Books and References												
Text Books:												
1. Setha, 'Applied Electronics', S.Chand, 2006.												
2. Malvino, "Electronic Principle", Tata McGrew-Hill. 2008.												
References:												
1. Sze, SM, "Physics of Semiconductor Devices", Wiley Eastem, 1981.												
2. Boylestad and Nashelsky, "electronic Devices and Circuit Theory", PHI 6 th Edition, 1999.												
3. Mothersheed, "Electronic Devices and Circuits", Prentice Hall of India 1999.												
4. Streetman, B, "Solid State Electronics Devices", Prentice Hall of India, 4 th Edition. 1995.												
5. John D. Ryder, "Electronic Fundamentals And Applications, Integrated and Discrete System", 5 th Edition, Prentice Hall of India, 1999.												
6. David Newman, "Semiconductor Physics and Devices – Basic Principles, Tata McGrew-Hill. 1999.												
7. http://nptel.ac.in/courses/108106075/												
Course Description												
Gain basic knowledge about low power semiconductor devices and its function.												
Prerequisites						Co-requisites						
Basic Electrical & Electronics Engineering						Nil						
required, elective, or selected elective (as per Table 5-1)												
Required												
Course Outcomes (COs)												
CO1: To acquaint the students with construction, theory and characteristics of the p-n junction diode												
CO2: Familiarize with the structure of basic electronic devices.												
CO3: To acquaint the students with construction, theory and characteristics of the Field effect transistor												
CO4: To acquaint the students with construction, theory and characteristics of the Power control / regulator devices												
CO5: To acquaint the students with construction, theory and characteristics of the LED, LCD and other photo electronic devices												
Student Outcomes (SOs) from Criterion 3 covered by this Course												
COs/SOs	a	b	c	d	e	f	g	h	i	j	k	l
CO1	M									L		
CO2			H	L	H	M	H	M	H	L		

CO3		L									H	
CO4	M				M			H	H			L
CO5		L		M								

List of Topics Covered

UNIT I ELECTRON DEVICES 9

Concept of electronic current in vacuum, gas and solid – Effect of electric and magnetic field on electron and other charged particles – Cathode ray tube – Electrostatic and magnetic deflection.

UNIT II SOLID STATE ELECTRONICS 9

Review of energy band structure of Ge, Si and GaAs –electron, hole generation and recombination – drift and diffusion currents – Continuity equation – Hall effect – PN junction – current equation – junction capacitance – breakdown characteristics – varactor, tunnel, fast recovery, scottkly and zener diodes.

UNIT III BIPOLAR JUNCTION TRANSISTOR 9

Ebers-Moll equation – Input / Output characteristics – Switching characteristics – ‘h’ parameters – low Frequency equivalent circuits – RF transistors – Power transistors.

UNIT IV FET, UJT AND SCR 9

Theory and characteristics of JFET and MOSFET – low frequency and high frequency equivalent circuits – theory and characteristics of UJT, SCR and TRIAC.

UNIT V CCD AND OPTOELECTRONIC DEVICES 9

Charge transfers and charge coupled devices – Theory and applications – semiconductor optoelectronic devices – LED, LASER diode, LCD, Photo diode, solar cell.