

Programme	Bachelor of Science in Solid State Physics (BS SS Physics)	Course Code	SSP-302	Credit Hours	3 (2-1)
Course Title	Electronics – I				
Course Introduction					
<p>This course is designed:</p> <p>To develop the understanding of different electronic circuit elements and devices like diode, transistors, amplifiers, oscillators and voltage regulators used in daily life alliances</p> <p>To understand the day to day electronic devices</p>					
Learning Outcomes					
<p>By the end of this course, students should:</p> <ol style="list-style-type: none"> 1. Understand and apply concepts of combinational logic design to implement circuits. 2. Understand and apply concepts of sequential logic design to implement circuits. 3. Understand and apply concepts of state machines. 4. Develop the ability to design combinational circuits using programmable logic devices 					
Course Content					Assignments/Readings
Week 1	Unit-I 1.1 Special Diodes 1.1.1 Zener diodes, Zener regulators				What is function of a diode?
Week 2	Unit-II 2.1 Schottky diodes, Light emitting diodes.				What are LEDs?
Week 3	Unit-III 3.1 Photodiodes, Tunnel diodes				What is the function of photodiode?
Week 4	Unit-IV 4.1 Varistors and their applications.				What is varistor?
Week 5	Unit-V 1.1 Transistor Circuits 5.1.1 Bipolar transistors; parameters and ratings, Ebers-Moll				Solve some examples

Week 6	Unit-VI 6.1 Hybrid-p and h,z and y-parameter models, Switching circuits, Biasing and stability	What is biasing of a circuit?
Week 7	Unit-VII 7.1 Common emitter, Common base and common collector amplifiers	What is amplifier?
Week 8	Mid Term Exams	
Week 9	Unit-VIII 8.1 Frequency response, Power class A, B, and C amplifiers,	Field Effect transistors
Week 10	Unit-IX 1.1 FET 9.1.1 Transistors; Junction FET, MOSFET, Operation and construction, Biasing, Common source and common drain amplifiers	Applications of FETs
Week 11	Unit-X 10.1 Frequency response. Multistage Amplifiers; RC coupled and direct coupled stages, The differential amplifiers, Negative feedback, Tuned RF Voltage amplifiers, I-F Amplifiers and automatic gain control	
Week 12	Unit-XI 11.1 Operational Amplifiers 11.1.1 Ideal op-amps, Simple op-amp arrangements, its data and sheet parameters, Non inverting and inverting circuits	What is op-amp?
Week 13	Unit-XII 12.1 Feedback and stability, Op-amp applications; Comparators, Summing, Active filters, Integrator and Differentiator, Instrumentation amplifier	Solve problems
Week 14	Unit-XIII 13.1 Oscillators 13.1.1 Armstrong, Hartley, CMOSS, Colpitt's Phase shift and 555 timer oscillators	Practice

Week 15	Unit-XIV 14.1 Voltage Regulators 14.1.1 Series, Shunt and switching regulators. Power supply.	Presentations
Week 16	Final Term Exams	
Textbooks and Reading Material		
<p>1. J. Millman & C.C. Halkias, 'Integrated Electronics', McGraw Hill Book Company, Singapore (Latest Edition).</p> <p>2. T.L. Floyd, 'Electronic Devices', Merrill Publishing Company Columbus (1988).</p> <p>3. A.P. Malvino, 'Electronic Principles', Tata McGraw Hill, New Delhi (1988).</p> <p>4. D.B. Bell, 'Electronic devices & Circuits', Reston Publishing Company Inc., Virginia (1980).</p> <p>5. C.J. Savant Jr. M.S. Roden, G.L. Carpenter, 'Electronic Design Circuit & Systems', The Bengamin/Cummings Publishing Co., California (1991).</p>		
Teaching Learning Strategies		
<ol style="list-style-type: none"> 1. Course Teaching 2. Presentations 3. Quiz 		
Assignments: Types and Number with Calendar		
<ol style="list-style-type: none"> 1. 2. 3. 4. 		
Assessment		

Sr. No.	Elements	Weightage	Details
1.	Midterm Assessment	35%	Written Assessment at the mid-point of the semester.

2.	Formative Assessment	25%	Continuous assessment includes: Classroom participation, assignments, presentations, viva voce, attitude and behavior, hands-on-activities, short tests, projects, practical, reflections, readings, quizzes etc.
3.	Final Assessment	40%	Written Examination at the end of the semester. It is mostly in the form of a test, but owing to the nature of the course the teacher may assess their students based on term paper, research proposal development, field work and report writing etc.