

Programme	Bachelor of Science in Solid State Physics (BS SS Physics)	Course Code	SSP-306	Credit Hours	3 (2-1)
Course Title	Electronics-II				
Course Introduction					
<p>This course is designed:</p> <p>To learn the basics of digital electronics such as Boolean Algebra.</p> <p>To develop logic circuit using Boolean Algebra.</p> <p>To understand the computer interface and micro-controller along with the embedded system.</p>					
Learning Outcomes					
<p>By the end of this course, students will be able to:</p> <p>Use of Boolean algebra.</p> <p>Understand the various combination logic circuits.</p>					
Course Content					Assignments/Readings
Week 1	Unit-I 1.1 Review of Number Systems 1.1.1 Binary, Octal and Hexadecimal number system, their inter-conversion, concepts of logic, truth table,				Basic logic gates
Week 2	Unit-II 1.1 Boolean Algebra 2.1.1 DeMorgan's theorem, simplification of Boolean expression by Boolean Postulates and theorem				Simplify some Boolean expressions
Week 3	Unit-III 3.1 K-maps and their uses. Don't care condition, Different codes. (BCD, ASCII, Gray etc.).				Parity in Codes
Week 4	Unit-IV 1.1 IC logic families 4.1.1 Basic characteristics of a logic family. (Fan in/out, Propagation delay time, dissipation, noise margins etc. Different logic based IC families (DTL, RTL, ECL, TTL, CMOS)				Practice

Week 5	Unit-V 1.1 Combinational logic circuit 5.1.1 Logic circuits based on AND – OR, OR-AND, NAND, NOR Logic, gate design, addition	Design NOR gate
Week 6	Unit-VI 1.1 Subtraction (2's compliments, half adder, full adder, half subtractor, full subtractor encoder, decoder, PLA. Exclusive OR gate. 6.1.1 Scattering experiments and cross sections, Potential scattering	
Week 7	Unit-VII 7.1 Sequential Logic Circuit 7.1.1 Flip-flops clocked RS-FF, D-FF, T-FF, JK-FF, Shift Register	Practice
Week 8	Mid Term Exams	
Week 9	Unit-VIII 8.1 Counters (Ring, Ripple, up-down, Synchronous)	A/D and D/A Converters
Week 10	Unit-IX 9.1 Memory Devices 9.1.1 ROM, PROM, EAPROM, EPROM, RAM, (Static and dynamic)	Applications of RAM
Week 11	Unit-X 10.1 Memory mapping techniques	
Week 12	Unit-XI 11.1 Micro Computers 11.1.1 Computers and its types, all generation of computers, basic architecture of computer, microprocessor (ALU, UP Registers, Control and Time Section)	What is microprocessor?
Week 13	Unit-XII 12.1 Addressing modes, Instruction set and their types, Discussion on 8085/8088, 8086 processor family, Intel Microprocessor Hierarchy;	
Week 14	Unit-XIII 13.1 Micro-controller/ Embedded System 13.1.1 Introduction to Embedded and microcontroller based systems; The Microprocessor and microcontroller	Practices

	applications and environment; microcontroller characteristics; features of a general purpose microcontroller;	
Week 15	Unit-XIV 14.1 Microchip Inc and PIC microcontroller; Typical Microcontroller examples:, Philips 80C51 & 80C552 and Motorola 68Hc05/08; Interfacing with peripherals	Presentations
Week 16	Final Term Exams	
Textbooks and Reading Material		
<ol style="list-style-type: none"> 1. Larry D. Jones, Principles and applications of digital electronics, Macmillan Publishing Company, 1993. 2. Digital System Design and Micro processor J.C. BORTIE (NBF). 3. McMillan, Micro Electron, McGraw Hill. 4. Digital Logic and Computer Design Morris Mano 1995 Prentice Hall 5. Tocheim, Digital Electronics, (1999). 6. Barry B. Brey, Intel UPS Architecture, programming and interfacing, Prentice Hall (1998). 7. T.L.Floyd, Digital Fundamentals, 8th edition. 8. Tim Wilmshurst, The Design of Small-Scale Embedded Systems, Palgrave (2003) 		
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.