Ch. Ranbir Singh University, Jind

Syllabus of SEC-2 (Physics)

for Under-Graduate Programme

Under Multiple Entry-Exit, Internship and CBCS-LOCF in accordance to NEP-2020w.e.f. 2023-24 (in phased manner)

SEC-SKILL ENHANCEMENT COURSE								
Course Type	**Course Code**	**Name of the Course**	**Credit**	**Contact Hours/ Week**	**Internal Assessment marks**	**End Term Marks**	**Max. Marks**	**Exam Duration**
SEC-2	**B23-SEC-225**	**Electrical Circuit Network Skill**	**2**	**2**	**15**	**35**	**50**	**3 hrs.**
		Practicum	**1**	**2**	**5**	**20**	**25**	**3 hrs.**

Level of the course: NA

Pre-requisite for the course (ifany): NA

Course Learning Outcomes (CLO):

1. To understand the basic concepts of Electrical Circuits
2. To repair the basic electric fault in circuit.
3. To calculate the monthly bill of any load
4. To create basic skill to make smart home.

Instructions for Paper-Setter

1. Nine questions will be set in all. All questions will carry equal marks.
2. Question No. 1, which will be short answer type covering the entire syllabus, will be compulsory. The remaining eight questions will be set unit wise selecting two questions from each Unit I to IV. The candidate will be required to attempt question No. 1 and four more questions selecting one question from each unit.

UNIT	TOPICS	CONTACT HOURS
I	**Introduction to Electricity and Circuits:** Basics of Electricity, Electric charges (positive and negative), Conductors,Insulators, Basic components of a circuit: battery, wires, bulb, switch etc. **Basic Electricity Principles:** Voltage, Current, Resistance, and Power, Ohm's law, Series, Parallel, and series-parallel combinations. Heating effects of current and applications, AC Electricity (Live, Neutral and Earth), frequency, DC Electricity (Positive and Negative poles).	**7**
II	**Understanding Electrical Circuits:**AC and DC Voltage Sources, Current and voltage drop across the DC circuit elements. Kirchhoff's laws. Instruments to measure current, voltage, power in DC and AC circuits. Familiarization with multimeter, voltmeter, and ammeter, Insulation. Preparation of extension board.Joints in electrical conductors. Techniques of soldering.	**8**
III	**Electrical Protection:** Relays, Fuses and disconnect switches, Circuit breakers, Overload devices,Surge protection. Ground-fault protection. Earthing and its types. **Smart Technology:** Smart Switches, Wi fi enabled switches, Smart Bulbs, Ways to make Smart home. Estimation of electric load, average electricity bill calculation.	**7**
IV	**Electrical Appliances:** Fan, Bulb, Electric Iron, LEDs, Working of DC & AC Motor, Water Pump, Water Cooler and Air Conditioner. Comparison of Invertor & Non-	**8**

	Invertor Air Conditioners. Invertor, Offgrid & ongrid Solar Systems for home. Ways to save electricity.	
Practicum	(1) To identify electrical components like resistor, capacitor, inductor, battery, switch, ammeter, voltmeter and to find the value of resistance using color coding. (2) To measure the resistance, voltage and current using a digital multimeter, voltmeter, and ammeter in a closed circuit. (3) To verify Ohm's law through experimental data. (4) To verify series and parallel circuits with resistors. (5) To verify current division and voltage division in series and parallel circuits. (6) To verify Kirchhoff's current law (KCL) through a series-parallel circuit. (7) To verify Kirchhoff's voltage law (KVL) through a series-parallel circuit. (8) To Measure the energy and power consumed by a resistor in a circuit using ammeter and voltmeter. (9) To make an extension board with at least three switches, a plug, a fuse, and an indicator. (10) To determine the frequency of ac mains using sonometer **Note: Student will perform at least five experiments. The examiner will allot one practical at the time of end term examination.**	**30**

Suggested Evaluation Methods

InternalAssessment:	**End Term Examination:**
➢ **Theory** • Class Participation: 4 • Seminar/presentation/assignment/quiz/class test etc.: 4 • Mid-Term Exam: 7 ➢ **Practicum** • Class Participation: NA • Seminar/Demonstration/Viva-voce/Lab records etc.: 5 • Mid-Term Exam: NA	➢ **Theory** • Written Examination: 35 ➢ **Practicum** ➢ Practical Examination: 20

Learning Resources

1. A Text book of Electrical Technology - B L Theraja, A K Theraja - S Chand & Co.
2. Fundamental of electric circuits-C. K. Alexander, M.N.O.Sadiku, Mcgraw hill.
3. Fundamentals of electric circuit theory-D. Chattopadhyay, P.C. Rakshit, S. Chand.