ST. XAVIER'S COLLEGE (AUTONOMOUS), AHMEDABAD-9
FACULTY OF SCIENCE

DEPARTMENT OF PHYSICS & ELECTRONICS

SEMESTER – I

SYLLABUS

OF

BSc ELECTRONICS (HONOURS)

BASED ON UNDERGRADUATE CURRICULUM FRAMEWORK
(NEP – 2020)

(Effective from Academic Year 2023)

Curriculum Framework for Semester – I

Course	Title	Content		Credit
DSC-1	ELMC111C Fundamental of Electronics-I	U1	Number Systems and Codes	4
		U2	Boolean Algebra	
		U3	Diodes and their Applications	
		U4	General Amplifier Characteristics	
DSC-2	ELMC112L Electronics and Experiential Lab-I	14 Experiments		4
		Experiential Lab: Hands on experiment.		
Minor	ELMN1101 Basic Electronics-I	U1	Number Systems and Codes	4
		U2	Diodes and their Applications	
		U3	14 Experiments	
		U4		
MDC	MDC260C How Things Work	U1	Basics of Electricity and Household Electric Systems	4
		U2	Common Electronic Gadgets and How They Work	
		U3	Mechanical Appliances and Simple Machines	
		U4	Laboratory	
SEC	ELSE11C Electronics Design using C Programming	U1	C Language Programming	2
		U2	Electronics Designing Using C Programming	
AEC	Ability Enhancement Course		(To be offered by the concerned subject Department)	2
VAC	Value Added Course		(To be chosen from a basket of courses)	2
Total Credits				**22**

* DSC: Discipline Specific Core

St. Xavier's College (Autonomous), Ahmedabad

Syllabus of Semester–I to be implemented from the Academic Year **2025-26.**

DEPARTMENT OF PHYSICS & ELECTRONICS

Multidisciplinary Course: How Things Work

Course Code & Title	Credit Distribution of The Course				Eligibility Criteria	Prerequisite(s) of the Course (if any)
	Cr	Lecture hrs	Tutorial Hrs	Activity/Case study analysis		
MDC260C How Things Work	4	12x4	3x4		10 + 2 from a recognized board	Science Stream

Learning Objectives:

LO1	To introduce students to the fundamentals of electricity, its key concepts, and basic components used in electrical and electronic circuits.
LO2	To help students understand the working principles of common household and electronic appliances through simple analogies and functional diagrams.
LO3	To develop an awareness of energy usage, safety mechanisms, and household electrical systems including single-phase and three-phase supplies.
LO4	To enable students to perform basic calculations related to energy consumption and analyze practical applications like solar energy usage**.**

Course Outcomes:

CO1	Explain the concepts of voltage, current, power, and identify basic components like resistors, capacitors, and transformers in real-life contexts.
CO2	Students will be able to simplify complex Boolean expressions and design efficient combinational logic circuits using standard logic design techniques.
CO3	Interpret electricity bills and understand units like kWh, while also identifying the purpose and function of safety devices such as MCBs and ELCBs.
CO4	Demonstrate conceptual understanding through hands-on activities, basic calculations, and recognize the importance and applications of solar energy.

Unit 1: Basics of Electricity and Household Electrical Systems

Credit of Course: 1 Cr **Lecture 12 Hrs** **Tutorial 3Hrs**

[A] Fundamentals of Electricity and Components

What is electricity? Current, voltage, and power (basic idea), Introduction to electrical components: Resistors, capacitors (simple function and everyday analogy), Transformers – step-up and step-down concepts, AC and DC – basic differences with examples, Household power systems: Single-phase and three-phase supply, Types of switches: Single-phase switches, MCB (Miniature Circuit Breaker) – safety device, ELCB (Earth Leakage Circuit Breaker) – protection from shocks, How to calculate electricity usage: Energy = Power × Time, Understanding electricity bills, units (kWh), and charges

[B] Everyday Electrical Appliances

How the following work and how much power they use: Water Heater (Geyser) /Air heater, Ceiling Fan/Table fan, Air Conditions, Lighting Sources: Incandescent bulbs, CFLs, LEDs – efficiency and usage, and E-waste

Unit 2: Common Electronic Gadgets and How They Work

Credit of Course: 1 Cr **Lecture 12 Hrs** **Tutorial 3Hrs**

Introduction to Electronic Appliances – simple block diagrams, parts, and working: Music System – amplifier, speakers, microphones, Computer – CPU, memory, I/O devices, Mobile Phone – battery, touch screen, sensors, communication basics, Television – display types (LED), remote control, audio/video

(No circuit-level details – only conceptual understanding with diagrams)

Unit 3: Mechanical Appliances and Simple Machines

Credit of Course: 1 Cr **Lecture 12 Hrs** **Tutorial 3Hrs**

Engines: Introduction to petrol and diesel engines, Basic parts: piston, crankshaft, combustion, Water Pump & Motor

Unit 4: Laboratory

Credit of Course: 1 Cr **Lecture 12 Hrs** **Tutorial 3Hrs**

Demonstrations of real appliances, Simple calculations related power grids and group discussions, Usage of Solar Power- Solar cell, principle, working, Solar panel and types - Quiz and field visits (if feasible)

Reference Books:

- Principles of Electronics by VK Mehta
- How Things Work by Charles F. Bowman
- How Things Work Encyclopedia