

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



DEPARTMENT OF PHYSICS & ELECTRONICS

SEMESTER – III

SYLLABUS
OF
BSc ELECTRONICS (HONOURS)

BASED ON UNDERGRADUATE CURRICULUM FRAMEWORK
(NEP – 2020)

(Effective from Academic Year 2023)

Curriculum Framework for Semester – III

Course	Title	Content		Cred it
DSC-5 (Theory)	ELMC331C Basic Analog Electronics-I	U1	Frequency Response of Amplifiers & Multi stage Amplifiers	4
		U2	Negative Feedback in transistor amplifier	
		U3	Field Effect transistor and MOSFET	
		U4	Transistor Oscillators	
DSC-6 (Theory)	ELMC332C Basic Digital Electronics and Microprocessors	U1	Flip-Flops and Shift Registers	4
		U2	Data processing circuits, Clock and 555 timer	
		U3	Microprocessor-I	
		U4	Microprocessor-II	
DSC-7 (Laboratory)	ELMC333L Electronics and Experiential Lab-III	14 Electronics Experiments		4
		Experiential Lab: Hands on experiment.		
SEC	ELSE331C Arduino (SWAYAM)	U1	Arduino	2
		U2	Laboratory Component	
MDC	MDC260C How Things Work	U1	Electric and home appliances	4
		U2	Light and Communication appliances	
		U3	Mechanical Appliances and Simple Machines	
		U4	Solar cell and sensor-based appliances	
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: Electric and Home Appliances

Credit of Course: 1 Cr

Lecture 12 Hrs

Tutorial 3Hrs

[A] Introduction; Household power system: Single phase and three phase; Types of switches: MCB and ELCB; Understanding of Electricity consumption and distribution of power; Energy audit.

[B] **Home appliances:** Table fan and ceiling fan; water heater and air heater; Air conditioner; Microwave; OTG

Unit 2: Light and Communication Appliances

Credit of Course: 1 Cr

Lecture 12 Hrs

Tutorial 3Hrs

[A] Introduction; Light Sources: CFL, Incandescent, LED, Television Display(technology), CRT, LCD, LED, OLED

[B] **Mobile phone communication:** 2G, 3G, 4G ,5G and CCTV

Unit 3: Mechanical Appliances and Simple Machines

Credit of Course: 1 Cr

Lecture 12 Hrs

Tutorial 3Hrs

[A] Introduction to ECE, ICE, EV Automotive petrol engine, 2 strokes and 4 stroke engine, Diesel engine

[B] **Engine main parts:** piston, crank, crank shaft etc, carburettor, Injector, Radiator.

Unit 4: Solar cell and sensor-based appliances

Credit of Course: 1 Cr

Lecture 12 Hrs

Tutorial 3Hrs

[A] **Solar Cell:** Principle, working and efficiency usage of Solar Power, Solar panel connections, Solar panel through grid and through power grids and through inverters

[B] **Sensors:** Temperature, pressure, SPO2, Proximity sensors ADAS, Radar.

Reference Books:

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