

**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		Credit
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–III to be implemented from the Academic Year 2025-26.

DEPARTMENT OF PHYSICS & ELECTRONICS

Skill Enhancement Course: Arduino (Swayam)

Course Code & Title	Credit Distribution of The Course				Eligibility Criteria	Prerequisite(s) of the Course (if any)
	Cr	Lecture + Tutorials hrs	Laboratory Hrs per week	Activity/Case study analysis		
ELSE331C: Arduino (Swayam)	2	12 + 3	2		10 + 2 from a recognized board	Science Stream Math-Group

Learning Objectives:

LO1	Understand the interfacing of various input/output devices (like push buttons, LEDs, LCDs, seven-segment displays) with Arduino, and implement functions like PWM and ADC.
LO2	Develop embedded programs using Arduino IDE and AVR-GCC for digital logic design and wireless communication, combining C and assembly programming techniques.

Course Outcomes:

CO1	Demonstrate the ability to design and implement embedded systems using Arduino for real-time applications such as counters, displays, and wireless modules.
CO2	Integrate assembly and C programming with Arduino and AVR-GCC to develop advanced digital logic and display systems including LCDs and seven-segment displays.

Unit 1: Arduino

Credit of Course: 1 Cr

Lecture 12 Hrs

Tutorial 3Hrs

Overview of Arduino, Electronic components and connections, Introduction to Arduino, Arduino components and IDE, First Arduino Program, Arduino with Tricolor LED and Push button, Arduino with LCD, Display counter using Arduino, Seven segment display, Pulse Width Modulation, Analog to Digital Conversion, Wireless Connectivity to Arduino, Assembly programming through Arduino, Digital logic design with Arduino, AVR-GCC programming through Arduino, Interfacing LCD through AVR-GCC programming, Mixing Assembly and C programming.

Text Book

- Swayam

Unit 2: Laboratory Component

S. No.	Experiment
1	Display Counter using Arduino
2	Pulse width modulation
3	Analogue to digital conversion
4	Wireless connectivity to Arduino
5	Digital Logic design with Arduino
6	Mixing Assembly and C programming
7	Interfacing LCD to AVR GCC programming
8	Seven Segment Display
9	Arduino with tri color with LED and Push button