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

DEPARTMENT OF PHYSICS & ELECTRONICS

SEMESTER – II

SYLLABUS

OF

BSc PHYSICS (HONOURS)

BASED ON UNDERGRADUATE CURRICULUM FRAMEWORK (NEP – 2020)

(Effective from Academic Year 2025)

Curriculum Framework for Semester – II

Course	Title	Content		Credit
DSC-3 (Theory)	PHMC221C Electromagnetics and Electronics	U1	Electrostatics	4
		U2	Magnetostatics	
		U3	Electric and Electronic Circuits	
		U4	Bipolar Junction Transistor	
DSC-4 (Laboratory)	PHMC222L Physics and Experiential Lab-II	14 Physics Experiments		4
		Experiential Lab: 1 hands on experiment.		
Minor-1 (Theory + Lab)	PHMN221C Basic Physics-II	U1	Electrostatics	2
		U2	Bipolar Junction Transistor	
		U3U4	14 experiments as mentioned in syllabus	2
Minor-1 (Theory + Lab)	ELMN221C Basic Electronics-II	U1	Network theorem and Filters	2
		U2	General Amplifier Characteristics	
		U3U4	14 experiments as mentioned in syllabus	2
SEC	PHSE221C Physics Analysis Using C Programming	U1	C Language Programming-I C Language Programming-II	2
		U2	Laboratory Component	
MDC	MDC206C Astronomy for Beginners	U1	Intr. to Astronomy and Observations in Astronomy	4
		U2	Principles and Tools for Observations in Astronomy	
		U3	Celestial Objects and Their Nature	
		U4	Field Trip/Project/Stargazing	
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–II to be implemented from the Academic Year **2025-26.**

DEPARTMENT OF PHYSICS & ELECTRONICS

SEC Course: Physics Analysis Using C Programming

Course Code & Title	Credit Distribution of The Course				Eligibility Criteria	Prerequisite(s) of the Course (if any)
	Cr	Lecture hrs	Laboratory hrs	Activity/Case study analysis		
PHSE221C: Physics Analysis Using C Programming	2	15x1	15x2		10 + 2 from a recognized board	Science Stream Math-Group

Learning Objectives:

LO1	Write, compile, and debug C programs using conditional statements, loops, arrays, and functions for various computational tasks.
LO2	Implement C programs to perform numerical conversions, statistical calculations, and physics-based simulations such as projectile motion and fluid flow.

Course Outcomes:

CO1	Understand and apply fundamental programming concepts in C including data types, control structures, arrays, and string operations for problem-solving.
CO2	Develop C programs to model and solve real-world problems in fluid mechanics, optics, conversions, statistics, and motion analysis.

Unit 1: C Language Programming

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

C Language Programming-I

Introduction to C, History about C, Flowcharts, Basic structure of a C program, Executing a C program, Keywords and identifiers, Variables, C operators, reading a character, writing a character, Formatted input, Formatted output, Decision making with if statements, Simple if statement, if-else statement, nesting of if-else statements, else if ladder, switch statements

C Language Programming-II

Conditional operator, go to statement, While statement, do statement, do while, for statement, jumps in loops – continue and break statements Arrays, one dimensional arrays, declaration and initialization of arrays, two dimensional and multi-dimensional array, Declaring and initializing string variables, reading and writing strings, arithmetic operations on characters, concatenation, comparing, copying and finding length of strings.

Text Book:

- Ch-1 -7, Programming in ANSI-C, **Balagurusamy E,** (Iind.Ed), TMH publication.

References Books:

- C programming language, **Kernighan B.W** and **Ritchie D.K**, PH publication.
- Learn C The Hard Way, **Zed A. Shaw**, Zed Shaw's Hard Way Series
- Programming in C **P.Day and M.Ghosh**. Oxford University Press.
- B.S. Programming with C**, Gottfried,** 8. Kenetker Y. Let us C, BPB publication.
- Head First C**, David and Dawn Griffiths**, O' Reilly

Unit 2: Laboratory Component

Credit of Course: 1 Cr **Laboratory 30Hrs**

1	Write a C program to simulate fluid flow in pipes, tanks, or other geometries. You can calculate parameters like flow rate, pressure drop, and velocity profiles
2	Write a C program to solve problems related to optics, such as calculating the path of light rays through different optical elements, like lenses or mirrors.
3	C-Program to convert Binary to Decimal
4	C-Program to convert Binary to Hexadecimal
5	C-Program to convert Fahrenheit to Celsius
6	C-Program to convert the Electricity Bill
7	C-Program to convert Days into years, months, days
8	C-Program to Find mean, variance and standard deviation
9	Write a C program to find maximum height, total time and range of projectile motion.
10	Write code in C for vertically upward motion.
11	Write a C program for prime number, natural number, even or odd number.
12	Write a C program for Fibonacci number