FIRST YEAR OF BACHELOR OF SCIENCE MINOR PHYSICS REVISED SYLLABUS ACCORDING TO CBCS NEP2020

COURSE TITLE: GRAPHICS USING COMPUTER
SEMESTER-II, W.E.F. 2023-2024

RECOMMENDED BY THE BOARD OF STUDIES IN PHYSICS
AND
APPROVED BY THE ACADEMIC COUNCIL

Devrukh Shikshan Prasarak Mandal's
Nya. Tatyasaheb Athalye Arts, Ved. S. R. Sapre Commerce, and Vid. Dadasaheb Pitre Science College (Autonomous), Devrukh. Tal Sangmeshwar, Dist. Ratnagiri-415804, Maharashtra, India

Academic Council Item No: _____

Name of the Implementing Institute	:	Nya. Tatyasaheb Athalye Arts, Ved. S. R. Sapre Commerce, and Vid. Dadasaheb Pitre Science College (Autonomous), Devrukh. Tal. Sangmeshwar, Dist. Ratnagiri-415804,
Name of the Parent University	:	University of Mumbai
Name of the Programme	:	Bachelor of Science
Name of the Department	:	Physics
Name of the Class	:	First Year
Semester	:	Second
Paper	:	I
No. of Credits	:	02
Title of the Course	:	Graphics using Computer
Course Code	:	S109PHT
Name of the Vertical in adherence to NEP 2020	:	Minor
Eligibility for Admission	:	Any 12^{th} Pass seeking Admission to Degree Programme in adherence to Rules and Regulations of the University of Mumbai and Government of Maharashtra
Passing Marks	:	40%
Mode of Assessment	:	Formative and Summative
Level	:	UG
Pattern of Marks Distribution for TE and CIA	:	60:40
Status	:	NEP-CBCS
To be implemented from Academic Year	:	2023-2024
Ordinances /Regulations (if any)		

Syllabus for First Year of Bachelor of Science

(With effect from the academic year 2023-2024)

SEMESTER-II **Paper No.– Minor(CS) – I**

Course Title: Graphics using computers **No. of Credits - 02**

Type of Vertical: Minor **COURSE CODE: S109PHT**

Learning Outcomes Based on BLOOM's Taxonomy:

After completing the course, the learner will be able to…

Course Learning Outcome No.	Blooms Taxonomy	Course Learning Outcome
CLO-01	Remember	Understand Computer Graphics concepts
CLO-02	Understand	Understand various types of graphics displays
CLO-03	Apply	Apply scan conversion to lines, cicle, ellipse etc
CLO-04	Understand	Understand various graphic transformations
CLO-05	Understand	Understand basics of windowing, clipping & object design
CLO-06	Apply	Explain various algorithms used in computer graphics

COURSE CONTENT			
Module	**Content**	**Credits**	**No. of Lectures**
1	**Unit – I** **Introduction to Computer Graphics** Introduction to Computer graphics and its applications, Elements of graphics Displays. **Scan Conversion of lines:** Digital Differential Analyzer(DDA) algorithm, Bresenhams‟ Line drawing algorithm **Scan Conversion of a circle:** Bresenhams‟ method of Circle drawing, Midpoint Circle Algorithm, Midpoint Ellipse Algorithm. **Transformations** Introduction, Translation, Rotation, Scaling, Homogeneous co-ordinates, composite transformations, reflection and shear, Inverse transformations	01	15
2	Unit - II **Windowing and Clipping** Introduction to Viewing and Clipping, Window to viewport mapping, **2D Clipping system:** Point clipping, Introduction to Line Clipping- Mid-Point Subdivision Clipping Algorithm, Cohen-Sutherland Clipping algorithm. **Introduction to Polygon Clipping:** Sutherland-Hodgeman Algorithm. Character Clipping **Curves and Object design** Curve representation, Cubic Splines, Bezier curves, Properties of Bezier curves, B-Spline curves, comparison of Bezier curves and B-Spline curves	01	15
	Total	02	30

Note:- The introductory and practical oriented portion of most of the topics will be taught in flipped classroom mode.

Reference book:

Procedural elements of Computer Graphics, David F. Rogers, Tata McGraw Hill.
Computer Graphics, Donald Hearn, M P. Baker, PHI.

Computer Graphics: A programming Approach, Steven Harrington, McGraw-Hill.

Text book:

Techmax publication book

Additional References:

Computer Graphics: A programming Approach, Steven Harrington, McGraw-Hill.
Theory and Problems of Computer Graphics, Zhigang Xiang, Roy, plastock, Schaum‟s outline series, McGraw-Hill.

Required Previous Knowledge

Basic Knowledge of Coordinate geometry and computer architecture is required

Access to the Course

The course is available for all the students admitted for Bachelor of Computer Science as a Major. The students seeking admission in other disciplines may select the course as a minor considering the terms and conditions laid down by the University of Mumbai, the Government of Maharashtra, and the college, from time to time.

Forms of Assessment

The assessment of the course will be of Diagnostic, Formative and Summative type. At the beginning of the course diagnostic assessment will be carried out. The formative assessment will be used for the Continuous Internal Evaluation whereas the summative assessment will be conducted at the end of the term. The weightage for formative and summative assessment will be 60:40. The detailed pattern is as given below.

Term End Evaluation (30 Marks)
Question Paper Pattern
Time: 2:00 hours

Question No.	Unit/s	Question Pattern	Marks
Q.1	All	Fill in the Blanks	
Q.2	All	Theory questions (any three out of six)	
Q.3	All	Theory questions (any three out of six)	
Q.4	All	Programming exercises (any five out of eight)	
	Total		**30**

Internal Evaluation (20 Marks)

Sr. No.	Description	Marks

1	Mid Term Examination	
2	Classroom Performance based on self-study	
3	Assignments	
	Total	**20**

Grading Scale

The grading scale used is O to F. Grade O is the highest passing grade on the grading scale, and grade F is a fail. The Board of Examinations of the college reserves the right to change the grading scale.