



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

COURSE TITLE: PRACTICALS IN GRAPHICS AND PYTHON
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.Sanameshwar, Dist. Ratnagiri-415804, Maharashtra, India

Academic Council Item No: **03 dated 8 July 2023**

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
No. of Credits	:	02
Title of the Course	:	Practicals in Graphics and Python
Course Code	:	S111PHP
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	:	Summative at the end of semester
Level	:	UG
Pattern of Marks Distribution for SEE	:	100 %
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) Practical

Course Title: Practicals in Graphics & Python

No. of Credits – 02

Type of Vertical: Minor

COURSE CODE: S111PHT

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	Know the structure of graphics systems
CLO-02	Understand	Understand the rendering of pixels, shapes etc and working of regular expressions, understand iterables and iterators
CLO-03	Apply	Use various algorithms to draw the intended graphic figures
CLO-04	Analyze	Use regular expressions
CLO-05	Evaluate	Work out curves as needed, arrange exception handling
CLO-06	Create	Animate various graphics objects, create GUI controls, send emails, read contents of urls

Syllabus for First Year of Bachelor of Science

(With effect from the academic year 2023-2024)

SEMESTER-II

Paper No–Minor(CS) Practical

Course Title: Practicals in Graphics & Python

No. of Credits – 02

Type of Vertical: Minor

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COURSE CONTENT

List of Experiments

Graphics

1. Study and use of graphics library for drawing primitive images.
2. Write a program to a line using following algorithms:
 - (i) Digital Differential Analyzer (DDA),
 - (ii) Bresenham's Line drawing method
3. Write a program to draw circle using the following algorithms
 - (i) Bresenham's circle drawing method
 - (ii) Midpoint circle drawing algorithm
4. Write a program to demonstrate the following primitive 2D transformations on a unit square or a triangle:
 - (i) scaling in X or Y or Both directions
 - (ii) translation in X or Y or Both directions
 - (iii) shear transformation
 - (iv) reflection about an axis
 - (v) rotation transformation
1. Write a program to rotate a line about an arbitrary point (x,y). [*Use shift of origin*]
2. Write a program to draw an origin centered 3D cube on the screen. (Use shift of origin and bring origin of coordinate at the center of the screen)
3. Implement line clipping algorithm using
 - (i) Mid-Point Subdivision Clipping Algorithm
 - (ii) Cohen-Sutherland Clipping algorithm
4. Write a program to generate a Bezier curve for the N input control points. (take n= 4, 5 and 6).
5. Generate cylinder as surface of revolution by rotating a line around an axis. (use delay for better visualization)

Programming with Python - II

1. Programs to read and write files.
2. Programs with iterables and iterators.
3. Program to demonstrate exception handling.
4. Program to demonstrate the use of regular expressions.
5. Program to show draw shapes & GUI controls.
6. Program to create server-client and exchange basic information.
7. Program to send email & read contents of URL.

Note:- The introductory and simple portion from the experiments will be taught in flipped classroom mode.

Note:- All the practicals are mandatory and are required to be completed by the students

Reference books:

1. Procedural elements of Computer Graphics, David F. Rogers, Tata McGraw Hill.
2. Computer Graphics, Donald Hearn, M P. Baker, PHI.
3. Computer Graphics: A programming Approach, Steven Harrington, McGraw-Hill.
4. Computer Graphics: A programming Approach, Steven Harrington, McGraw-Hill.
5. Theory and Problems of Computer Graphics, Zhigang Xiang, Roy, plastock, Schaum"s outline series, McGraw-Hill.
6. Paul Gries, Jennifer Campbell, Jason Montojo, Practical Programming: An Introduction to Computer Science Using Python 3, Pragmatic Bookshelf, 2/E 2014
7. Techmax publication book
8. James Payne , Beginning Python: Using Python 2.6 and Python 3, Wiley India, 2010
9. Lukaszewski, MySQL for Python: Database Access Made Easy, Pact Publisher, 2010

Access to the Course

The course is available for all the students admitted for Bachelor of Science.

Methods of Assessment

Vocational Skill Courses, Skill Enhancement Courses and the courses having laboratory sessions shall be assessed at the end of each semester.