AC-

Item No-

RayatShikshanSanstha's

Karmaveer Bhaurao Patil College,Vashi

Sector-15- A, Vashi, Navi Mumbai - 400 703

(Autonomous)

Department of Physics

SKILL BASED COURSE

FOR F. Y. B. SC.

'LABORATORY INSTRUMENTS AND MEASURING TECHNIQUES'

1. NAME OF THE COURSE: - **Laboratory Instruments and Measuring Techniques**

2. OBJECTIVES OF THE COURSE:

- Be able to identify and use every day physics laboratory equipments
- To tabulate data and display it in the form of histograms, or linear or logarithmic graphs.
- To draw curves through plotted data and how to derive results from, for instance, the gradients of such curves.
- Understanding of the fundamentals of statistical analysis of data, and especially the importance of experimental errors.
- To estimate and compound experimental errors, and demonstrate an understanding of their importance in the interpretation of results.
- Keep adequate laboratory records of their work.
- Organise their time efficiently so as to finish the experiments and write up their reports on time.

3. Course Duration: 30 Hrs.

4. Intake Capacity: 25 students

6. Duration: 5 weeks

7. Evaluation Pattern:
   a) Practical Exam: 50 Marks
   b) Theory Exam: 50 Marks

8. Course taken by:

SYLLABUS: Laboratory Instruments and Measuring Techniques

Module No.	Topics	No. of Hours
I	**Vernier Caliper - Graduated and Digital:** Definition, Introduction (principle, construction and working), Least count, Various usage of Vernier caliper, Difference between the Graduated and Digital Vernier caliper.	03
II	**Micrometer Screw Gauge - Graduated and Digital :** Definition, Introduction (principle, construction and working), least count, various usage of Micrometer Screw Gauge, Difference between the Graduated and Digital Micrometer Screw Gauge.	03
III	**Spherometer - for Concave and Convex surface :** Definition, Introduction (principle, construction and working), Least count, various usage of Spherometer-it is use to calculate the radius of Concave surface as well as Convex surface.	03
IV	**Travelling Microscope :** Definition, Introduction (principle, construction and working), Least count, Travelling Microscope is use in two dimension (2D) as well as three dimension (3D).	03
V	**Telescope - Laboratory and Observational :** Definition, Introduction (principle, construction and working), Telescope used for laboratory purpose as well as Observational (celestial observation) purpose.	06
VI	**Spectrometer :** Definition, Introduction (principle, construction and working)- Collimator, Telescope, Prism table, Procedure for Optical leveling and adjustments for Schuster's method.	06
VII	**Multimeter:** Definition, Various usage of Multimeter such as Voltmeter, Current meter, Ohm meter, LCR meter, Component testing.	06

Course Outcomes:

- Identify electronics/ electrical instruments, their use, peculiar errors associated with the instruments and how to minimize such errors
- Explain the industrial and laboratory applications of such instruments
- Service and maintain such instruments in case of damage or misuse
- Understand the basic design techniques of electronic equipment
- The students will o use various laboratory instruments like cathode ray oscilloscope, function generators, dismantle and recouple serviceable parts of some other selected instruments without damaging them.