Shri R. K. Parikh Arts and Science College, Petlad.
Add-on course for Science

Course title : "**Basic Microscopy techniques for biological studies**"

Coordinator : Dr. K. B. Anjaria

Department : Biology

Duration : 30 hours (20 hours Theory and 10 hours practical).

Teaching faculties : Dr. K. B. Anjaria and Ms. Rikita J. Amin

Course content (syllabus)

THEORY

A. Introduction to Microscopy: (4 hours)

History, definition of microscopy, types of microscopes, scales of measurement, diversity of cell shape and size and other biological specimens, optical principles, parts of microscope, kind of lens, terms useful in microscopy studies. Brief views on micrometry.

B. Working principles of some microscopes (12 hours)

1. Simple Microscope 2. Compound Microscope 3. Research Microscope 4. Binocular Dissection Microscope 5. Phase Contrast Microscope 6. Fluorescent Microscope 7. Scanning Electron Microscope 8. Transmission Electron Microscope.

C. Preparation for microscopy (4 hours)

Sample preparation, kinds of stains and staining techniques useful in UG biology laboratory.

PRACTICAL (10 hours)

1. Basic lab instructions for biology laboratory.
2. Sketch the diversity of cell shape and size with measurement.
3. Identify the various parts of simple and compound microscope.
4. Hands on training for the operation and use of simple, and compound microscope
5. Hands on training for the operation and use of research microscope, and binocular dissection microscope.
6. Demonstration of the working principle of Phase contrast and fluorescent microscope using model or photograph.
7. Demonstration of the working principle of Scanning Electron microscope and Transmission Electron microscope using model or photograph.
8. (optional) Field visit to the department of biosciences of Sardar Patel University and SICART (if permitted under COVID-19 guideline)

References:

1. Fundamentals of Light Microscopy and Electronic Imaging by Douglas B. Murphy
2. An Elementary Text-book of the Microscope by J. W. Griffith
3. Practical botany vol 1 and 2 by Bendre and Kumar
4. https://www.biologydiscussion.com/microscope/microscope-types-of-microscope/
5. https://microbenotes.com/category/microscopy/
6. https://nptel.ac.in/content/storage2/courses/102103044/pdf/mod3.pdf

Who can join the course: Any enrolled students of the college from the science faculty may join this course. This course will be more useful for all 'B' group students and especially students of microbiology, botany, zoology, biochemistry discipline.

Course Outcome: after successful completion of the course student will be able to

1. Understand the importance of microscopy techniques in the field of biology.
2. Acquire basic knowledge of various types of microscopes.
3. Handle the microscope scientifically for their routine biology practical.
4. Students will get certificate of merit from the Institute.