



# श्यामलाल सरस्वती महाविद्यालय (पी.जी.)

(चौ० चरण सिंह विश्वविद्यालय, मेरठ से सम्बद्ध)  
सरस्वती विहार, शिकारपुर – 203395 (बुलन्दशहर)  
मोबाइल : 9258321276, 9258321278

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पत्रांक .....

दिनांक: 12/10/23

## CERTIFICATE COURSE IN " BASIC LIGHT MICROSCOPY AND MICROTCHNIQUES"

Session 2022-23

Department of Botany is introducing a certificate course for the students of Biology and Biotechnology

<b>COURSE NAME</b>	Basic light microscopy and micro techniques
<b>DURATION</b>	30-40 hours.
<b>ELIGIBILITY</b>	Under graduate students

### CONTENTS-;

1. SIMPLE AND COMPOUND MICROSCOPY
2. INSTRUMENTATION
3. DIFFERENT MECHANICAL AND OPTICAL COMPONENTS
4. STAINS AND STAINING
5. TEMPORARY AND PERMANENT SLIDE PREPARATION
6. MOUNTING OF SLIDES





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दिनांक: 12/10/23

## SUBJECT PREQUISITIES-;

1. To study botany, a student must have had the subject Biology/Biotechnology learnt at 10+2 level.
2. Keep interest in plants.
3. Skills and aptitude for scientific study and research.
4. Creativity and good comprehension while working on scientific procedures.





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पत्रांक .....

दिनांक: 19/10/23

## COURSE INTRODUCTION

The certificate course offers essential knowledge and technical skills to study plants in a holistic manner.

Students would also become aware of the social and environmental significance of plants and their relevance to the national economy.

COURSE NAME	Basic light microscopy and stereo techniques
DURATION	30-40 hours
ELIGIBILITY	Under graduate diploma







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पत्रांक .....

दिनांक: 12/10/23

## SYLLABUS FOR THE CERTIFICATE COURSE-;

### ' BASIC LIGHT MICROSCOPY AND MICROTECHNIQUES '

UNIT	TOPIC	NO. OF LECTURES
1.	SIMPLE AND COMPOUND MICROSCOPY Elementary knowledge of simple and compound microscope, principles of their working, parts of microscope. PRACTICAL- How to use a microscope, adjustment and maintenance of microscope.	06
2.	INSTRUMENTATION Autoclave, Centrifuge, PH meter, Plant press, Camera lucida	04
3.	DIFFERENT MECHANICAL AND OPTICAL COMPONENTS Optical instruments- classification, properties. Adjustment of lens. Mechanical instruments- micrometry, steel scale, microtome.	05
4.	STAINS AND STAINING Classification of stains, methods of staining, process of single and double staining. PRACTICAL- Preparation of various stains like safranin, fast green, cotton blue, Fuschic basic etc.	09
5.	TEMPORARY AND PERMANENT SLIDE PREPARATION. Study of plant materials, transverse sections, longitudinal sections, methods of section cutting. Preparation of temporary and permanent slides.	08
6.	MOUNTING OF SLIDES Mounting materials, benefits of mounting the slide. Temporary mounting and permanent mounting. PRACTICAL- How to mount a temporary and permanent slide.	04





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पत्रांक .....

दिनांक: 12/10/23

## TIME TABLE FOR CERTIFICATE COURSE

DAY	TOPIC	HOURS
DAY 1	UNIT-1 (SIMPLE AND COMPOUND MICROSCOPY) General introduction about the certificate course What is microscopy, types of microscopes.	02
DAY 2	Elementary knowledge of simple and compound microscope.	02
DAY 3	Theory – principles of working of microscopes, parts of microscope. Practical -adjustment and maintenance of simple and compound microscope.	02
DAY 4	UNIT -2 (INSTRUMENTATION) <ul style="list-style-type: none"><li>• AUTOCLAVE</li><li>• CENTRIFUGE – centrifugal force, types of centrifuges</li><li>• pH METER</li></ul>	02
DAY 5	<ul style="list-style-type: none"><li>• PLANT PRESS</li><li>• CAMERA LUCIDA – working of camera lucida.</li></ul>	02
DAY 6	UNIT -3(DIFFERENT MECHANICAL AND OPTICAL COMPONENTS) Classification of optical instruments, properties of optical instruments. Practical – adjustments of lens.	03
DAY 7	Micrometry Practical – measurements of different plant materials via micrometry.	02
DAY 8	UNIT -4(STAINS AND STAINING) What are stains, why staining is necessary for the plant materials. Classification of stains.	02
DAY 9	Practical – preparation of various stains like safranin, cotton blue, fast green, basic fuchsin, crystal violet, erythrosine etc.	02
DAY 10	Methods of staining- <ul style="list-style-type: none"><li>• Progressive staining</li><li>• Regressive staining</li><li>• Counterstaining</li><li>• Double, triple and quadruple staining.</li></ul>	02
DAY 11	Practical – preparation of slides of algae, fungi, bryophytes, pteridophytes and angiosperms with single and double staining using different stains.	03





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पत्रांक .....

दिनांक: 12/10/23

DAY 12	UNIT -5 TEMPORARY AND PERMANENT SLIDE PREPARATION Study of different plant materials, thalloid plants, vascular plants.	03
DAY 13	Types of sections- <ul style="list-style-type: none"><li>• Transverse section</li><li>• Longitudinal section</li></ul> Practical- various types of section cuttings of roots, stems and leaves.	02
DAY 14	Practical – temporary slides preparation. Permanent slides preparation of- <ul style="list-style-type: none"><li>• Volvox coenobium colony</li><li>• Oedogonium cap cells</li><li>• Unilocular and plurilocular sporangia of Ectocarpus.</li><li>• Zeamays young root</li><li>• Zeamays old root</li><li>•</li></ul>	03
DAY 15	UNIT- 5(MOUNTING OF SLIDES) Why mounting is necessary for the sections of different plant materials. whole mounts, mounting materials.	02
DAY 16	Temporary and semi-permanent mounts Permanent whole mounts.	02





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पत्रांक .....

दिनांक: 01/01/23

## NOTICE

This is to inform to all the students of UG (science stream) that department of BOTANY is going to start a 15 days certificate course "BASIC LIGHT MICROSCOPY AND MICROTÉCHNIQUES" from dated 9<sup>th</sup> January 2023. The basic objective of this course is to impart knowledge on various fields of microscopy. All the students who are interested to participate in this course can register their names to Ms Ankita Bhardwaj with the attachments of marksheet of last passing year, college identity card.

Date - 01/01/2023

*Peshu*

HOD BOTANY

