MGM INSTITUTE OF HEALTH SCIENCES

(Deemed University u/s 3 of UGC Act, 1956)
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Value Added Course

MICROSCOPE AND STAINING TECHNIQUE

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Mahatma Gandhi Mission's
Medical College

Value Added Course

Microscope and Staining Techniques
[Conducted by Dept of Anatomy]

Light Microscopy: Eye of Medicine

The development of the microscope is tightly coupled with developments in cell biology and medicine. Microscopes provide the observer with enhanced resolution (ability to observe two nearby objects as distinct objects), contrast (ability to detect different regions of the specimen on thebasis of intensity or colour) and magnification (ability to make small objects visible). The human eye can resolve objects of the order of 0.1 mm, while the light microscope can resolve objects on the order of 0.2 mm (200 nm) with a magnification of 1000X.

The development of various types of optical microscopesincorporated the following components: microscope objectivesthat minimize chromatic and other optical aberrations (image distortion), stands that minimize mechanical vibrationsand sources of illumination from sunlight to lasers.

Additionally, there were new methods of fixing and cuttingspecimens (microtomes), specimen staining techniques (dyes, stains, molecular probes) that increase specimen contrast. Also important were the development of variousoptical methods that provide contrast (phase and differentialinterference microscopes, fluorescence microscopes) for live cells, techniques for imaging long-term live cell cultures (time-lapse and video-microscopy), optical techniques to provide optical sectioning of specimens (confocal microscopes), and nonlinear-optical imaging techniques (multiphoton, harmonic generation and coherent anti-Stokes Raman microscopes).

Staining methods:

Staining of slides is key to visualized slides. It helps in differentiating cells and tissue architecture. It has immense importance to identify normal from abnormal structures, cells and dysplastic tissue.

Standard tissue staining protocols evolved in 100 year of time. Which gives sharp and crispy images as well preserve tissue for years to come.

Acquiring skill also helps medical student to understand staining method and why particular tissue stains in peculiar colour and stain.

Digital microscope imaging

Although microscopy plays a very important role in biology and medicine, the observationis performed with the naked eye under the conventional optical microscopes. This can result in eye fatigue after a relatively long time of continuous observation. In addition, the image information cannot be stored and processed for different image enhancement purposes. Tosolve these limitations, digital microscopes have been developed and tested.

Uses of microscopy:

In today's healthcare we cannot imagine medicine without eye of microscope. Various uses of microscopy vary from histology, pathology, physiology, haematology, microbiology to structure of drug discoveries to immunohistochemistry, biochemistry etc.

Knowledge of cutting edge technology and use of microscope is an essential skill development in practice of medicine and its various branches.

To make aware and develop microscopy skill this course is added.

Eligibility:

Medical students (MBBS)

Course schedule:

Sr. No.	Topic	Theory hrs.	Practical hrs.
1	Microscopy introduction & history	1 hr.	-
2	Concept of magnification & resolution	1 hr.	1 hr.
3	Units used in microscopy	1 hr.	-
4	Different types of microscopes, their uses, advantages & disadvantages	2 hrs.	-
5	Light microscopy introduction & principle	1 hr.	-
6	Parts of light microscope	1 hr.	1 hr.
7	Algorithm for the use of light compound microscope	1 hr.	3 hrs.
8	Care of microscope	1 hr.	2 hrs.
9	Introduction to tissue processing	1 hr.	1 hr.
10	Slide preparation	1 hr.	1 hr.
	Total	**11 hrs.**	**9 hrs.**
		20 hrs	

- Evaluation Method – MCQ Test and practical evaluation 1hr.
- Course will be conducted twice a year
- Limited Entries (25 students per course)

Books for Reference:

1. Manual of Histological Techniques by Santosh Kumar Mondal; Jaypee publication.

2. Principles and Techniques in Histology, Microscopy and Photomicrography by D. R. Singh (Author) CBS publication.

3. FUNDAMENTALS OFLIGHT MICROSCOPYAND ELECTRONICIMAGINGSecond EditionByDouglas B. Murphy, Michael W. Davidson A JOHN WILEY & SONS, INC., PUBLICATION.

4. Bancroft's Theory and Practice of Histological Techniques by Kim S Suvarna MBBS BSc FRCP FRCPath (Author); Elsiver pub; 8th ed.