



COURSE SPECIFICATION

Electron Microscopy

Faculty of Medicine- Mansoura University

(A) Administrative information

(1) Programme offering the course:	M.D. degree of Histology & Cytology
(2) Department offering the programme:	Histology & Cell biology
(3) Department responsible for teaching the course:	Histology & Cell biology
(4) Part of the programme:	First part
(5) Date of approval by the Department`s council	
(6) Date of last approval of programme specification by Faculty council	
(7) Course title:	Electron microscopy
(8) Course code:	HIST 602 EM
(9) Total teaching hours:	30

(B) Professional information

(1) Course Aims:

The broad aims of the course are as follows:

The aim of this course is to prepare the candidate to be excellent in the fields of

1. Effective communication and leading team in different situations.
2. Continuous self development and transfer of knowledge and expertise to others
3. Knowledge and information towards the most general EM-techniques and the relevant areas they are presently used.
4. Advanced diagnostic procedures including ultra structural investigations.

(2) Intended Learning Outcomes (ILOs):

Intended learning outcomes (ILOs); Are four main categories: knowledge & understanding to be gained, intellectual qualities, professional/practical and transferable skills.

On successful completion of the course, the candidate will be able to:

A- Knowledge and Understanding

A1 Recognize the structure and components of transmission and scanning electron microscope.

A2 Identify the basis of spacemen handling

A3 Discuss different methods of fixation and the criteria of a good fixation.

A4 Identify types of buffers.

A5 Explain steps of dehydration and impregnation.

A6 Identify different types and procedures of sectioning.

A7 Define various methods of staining.

A8 Define the different applications of electron microscopy

B1 Use the ultra structural investigations in diagnostic procedures

B 2 Analyze and evaluate histological data.

B3 Apply the proper technique in spacemen handling and tissue processing to obtain good quality electron microscopic study.

B4 Use different types of staining techniques to identify ultrastructure details in the cells.

B5 Decide when to use transmission electron microscopy versus scanning electron microscopy

B6 Differentiate the good quality electron micrographs.

(3) Course content:

Subjects	Total Teaching Hours
Introduction Electron microscopy versus light microscopy	2
Tissue preparation <ul style="list-style-type: none"> • Spacemen handling • Factors affecting fixation 	2
Types of fixation: <ul style="list-style-type: none"> • Physical fixation • Cryo-fixation 	2
<ul style="list-style-type: none"> • Chemical fixation Principles • Primary Fixation 	2
Criteria of proper fixation Post fixation	2
Buffer Dehydration	2
Impregnation	2
Sectioning: <ul style="list-style-type: none"> • Trimming • Staining semi-thin sections • Ultra-thin sections • Sectioning problems 	2
Staining : <ul style="list-style-type: none"> • Enblock staining • Post staining 	2
<ul style="list-style-type: none"> • Staining of thin sections • Staining of ultra-thin sections 	2
<ul style="list-style-type: none"> • Negative staining • Other stainings 	1
Instrumental Base : <ul style="list-style-type: none"> • EM resolution & magnification • The electron gun and condenser system • The image-producing system 	2
Scanning E/M and other Types and applications of Electron Microscope	2
Scanning E/M <ul style="list-style-type: none"> • Introduction, • Materials, • Procedure, • troubleshooting 	2
Special considerations with EM specimens	1
Scanning E/M and other Types and applications of Electron Microscope	2
Total hours	30

(4) Teaching methods:

4.1: Lectures

4.2: Workshops

4.3: Seminars: the student presents a seminar in his/her own field of interest and attends the weekly seminars presented by invited guests, faculty members and students

4.4: Self learning (internet search for specific topics)

(5) Assessment methods:

5.1: Written exam for assessment of A1-6, B1, B2

5.2: MCQ Exam for assessment of A1-6, B1, B2

Percentage of each Assessment to the total mark:

Assessment MCQ Exam : 20Marks: 20%

Final Written Exam : 80 Marks: 80%

(6) References of the course:

6.1: Hand books: Histology and cell biology department book

6.2: Text books: Basic Histology, Bloom & Fawcet Histology, The Cell and Ham's Histology, Bancroft's Theory and Practice of Histological Techniques, Principles and techniques of electron microscopy

6.3: Journals: Histology & histochemistry journal, Cell, Cell biology, Science, Egyptian Journal of Histology and Cytology, Journal of Microscopy and Ultrastructure, Journal of Ultrastructure Research

6.4: Websites: <http://www.lab.anhb.uwa.edu.au/mb140/>,
<http://www.histology-world.com/stains/stains.htm>,
<http://www.bu.edu/histology/m/index.htm>, <http://www.uni-mainz.de/FB/Medizin/Anatomie/workshop/EM/EMAtlas.html>

(7) Facilities and resources mandatory for course completion:

Data show for power point presentations

Laboratories

Library

Computers

Microscopes

Course coordinator: Dr. Shireen Mazroa.

Head of the department: Dr. Amal Mohamed Moustafa
Date: 25/ 2 / 2018