Module (Course Syllabus) Catalogue

2024-2025

College/ Institute	Erbil Medical Technical Institute	
Department	MLT Department	
Module Name	Histopathological techniques	
Module Code	HIT 204	
Degree	Technical Diploma ■ Bachler ☐ High Diploma ☐ Master ☐ PhD ☐	
Semester	2rd	
Qualification	Master degree	
Scientific Title	Lecturer	
ECTS (Credits)	6	
Module type	Prerequisite ☐ Core ■ Assist. ☐	
Weekly hours	4	
Weekly hours (Theory)	(2)hr Class	(3)Total hrs Workload
Weekly hours (Practical)	(2)hr Class	(1)Total hrs Workload
Number of Weeks	16	
Lecturer (Theory)	Mustafa Hamadamin Rasool	
E-Mail & Mobile NO.	m.mustafa@epu.edu.iq	
Lecturer (Practical)		
E-Mail & Mobile NO.	009647504554437	
Websites	https://academicstaff.epu.edu.iq/faculty/m.mustafa	

Course Book

Course Description	**1.** This course which consists of (2) hours lecture & (2) hrs lab. per week for (12) weeks, is an introduction to Histology and Histolopatholoy and Preparing microscopical slides from body fluids and tissues.			
Course objectives	The purpose of this course is to introduce the students to histopathological techniques , exfoliative cytology & their diagnostic significance, also how to obtain (histological specimens) from human & animals and Definition of (biopsy) & (autopsy) speciemens & the difference between them. At the conclusion of this course the student should be able to demonstrate through written examinations, quizzes, and oral discussion the following achievements: 1. Demonstrate and understanding of basic histopathological techniques. 2. Explaining of the histopathological processes of tissues and body fluids. 3. Demonstrate basic laboratory skills.			
Student's obligation	The students should be attendance and complete of all tests, exams and assignments			
Required Learning Materials	lecture halls with data show equipment for lecture presentations, white board, overhead projector, posters			
Evaluation	**Task**	**Weight (Marks)**	**Due Week**	**Relevant Learning Outcome**

	Paper Review		1	1	
	Assignments	Homework	0.5	4	
		Class Activity	2	2	
		Report	1	1	
		Seminar	1	1	
		Essay	0	0	
		Project	0	0	
	Quiz		1	4	
	Lab.		2	12	
	Midterm Exam		1	2	
	Final Exam		1	3	

Specific learning outcome:	1- Specific learning outcome: 2- On successful completion of this program, graduates will be able to 3- Identify evaluate and apply major theoretical traditions in human histology 4- Understand how the slides are prepared from different tissues and fluids in the body. 5- Could be able to prepare all working solutions. 6- Preservation and fixation of all histological specimens. 7- Techniques for medical museum. 8- Personal safety.
Course References:	Handbook of Histopathological and Histochemical Techniques (including museum techniques) THIRD EDITION C. F. A. CULLING - Microtomy and Paraffin Section Preparation by Scientia**.**

Course topics (Theory)	Week	Learning Outcome
Definitions of (histological techniques) (exfoliative cytology) & their diagnostic significance.Definition of (Microtechnique)(histology)(cytology)& understanding the difference between these sciences& microtechnique.	10/2/2020	Able to knowing the general principle of cells, tissue, organs
How to obtain (histological specimens) from human & animals. Definition of (biopsy) & (autopsy) & the difference between them.	17/2/2020	Be able to knowing all the types of methods in transporting material across the biological membrane
The steps of preparation of histological slides& the name of each step Fixation: definition, purpose, classification of fixatives, & types of fixatives like: 1-10% formalin 2-Neutral buffered formalin 3-formol saline 4-bouin ´s solution 5-Zenker ´s solution c 6- Helly´ s & Carnoy's solutions With the advantages & disadvantages of each solution.	24/2/2020	Must be able to knowing all the part of the system and its functions
-The process of (washing) the specimens. Definition, aim, the solutions used & the time. -Dehydration: definition, aim, the solutions used, & the time. - Clearing: definition, aim, solutions used, characteristics of clearing solutions, & the factors affecting this process	2/3/2020	Be able to knowing all types of blood cells and their functions
- Infiltration (impregnation): definition, aim, substances used, types of paraffin wax& the factors affecting the process. - Sectioning: microtome, types(rotary, freezing, ultramicrotome),the difference in mechanism & uses	9/3/2020	Be able to know every parts of muscle system part and their functions

for each		
- Substances used to support the tissue during sectioning, section thickness, and type of fixative…. & other differences. - -Common errors during sectioning, causes & the solution.	16/3/2020	Be able to know every parts of nervous system part and their functions
- Staining: definition, aim, and classification of stains, staining theory depending on their chemical reactions, origin, methods of staining (direct & indirect staining).	23/3/2020	Be able to know every parts of renal system part and their functions
Stain solvents, factors affecting staining process, storage,& the choice of appropriate stain Definitions of: mordant, accelerator, counter stain, differentiation, Bleaching, basophilic stain, acidophilic stain, metachromasia.	30/3/2020	Be able to know every parts of Respiratory system part and their functions
- Routine stains: definition, aim, examples like hematoxylin & eosin. Common types of hematoxylin & method of preparation. -Exfoliative cytology: definition, uses, important diagnostic application.	6/4/2020	Be able to know every parts of Gastrointestinal system part and their functions
General features of normal cells, malignant cells, effect of inflammation on cellular morphology. The stain used for exfoliative cytology	13/4/2020	Be able to know every parts of Reproductive system part and their functions
Obtaining samples for cytological examination, fixation, and preparation of smears for detection of malignant cells.	20/4/2020	Be able to know every parts of Sensory organs part and their functions
Detection of common errors in the work, & how to correct these errors.	27/4 /2020	

- **Practical Topics (If there is any)**	**Week**	**Learning Outcome**
Introduction about: - the techniques about the preparation of microscopical slide for histological & cytological examination - the role of laboratory technologists - the equipments required - Preparation of different concentration of alcohol & other solutions whether Vol/Vol or Weigh / Vol. Definition of each step of tissue preparation & the solution required for each step.	11/2/2020	Be able to knowing all parts and their functions and how to use of microscope
Preparation of tissue samples (formalin fixed) for the students & perform: fixation, dehydration, clearing and infilteration. Embedding (blocking), trimming and mentioning all materials used in this step.	18/2/2020	Be able how to draw blood sample
Sectioning: definition, purpose with detail explanation for the rotary microtome. Common errors during the process of sectioning, causes and how to be avoided.	25/2/2020	Be able how to make a blood smear and detection of different types of blood sample in it
Mounting of tissue sections on glass slide. Definition, procedure and materials used.	3/3/2020	Be able to know how blood can be estimate
Staining tissue sections with routine stains (hematoxylin & eosin) Procedure of staining& preparation of staining solutions Student should preparet two slides for microscopical examination .Methods of cleaning slides from residual stains &solution & mounting media(Canada balsam)from edges of slide cover	10/3/2020	Being able to know how to detection the types of blood group
Preparation of tissue sections fixed in Zenker solution &Bouin´ s solution(note the color difference between them) Staining tissue sections by (special stains)	17/3/2020	Be able to practice on how can determination the ration of the PCV
Use Hematoxylin &Eosin to stain bone tissue. Compare results with Schmorl's stain.	24/3/2020	Be able to knowing how to detect the rate of bleeding and clotting rate

Cervical smear (pap smear) Specimen collection, fixative used, procedure & staining, results(normal or pathological) Normal cells, effect of inflammation on cell morphology, precancerous & cancerous changes.	31/3/2020	Be able how to detect blood pressure and thermal detection
Sputum smear Specimen collection, fixative used, procedure & staining Compare normal & abnormal cells	7/4/2020	Be able to detect the repiratory volume of the lung
Preparation of smears for serous fluids. Specimen collection, fixative used, procedure & staining Examination of the smear	14/4/2020	Be able to count RBC on microscope slide
Preparation of urine smears. Specimen collection, fixative used, procedure & staining Examination of the smear	21/4/2020	Be able to count WBC on microscope slide
Aspiration cytology, definition and uses. Preparation of smear for aspiration samples from breast, lymph nodes, and thyroid glands. Hospital visit to see the preparation of these samples	28/4 /2020	Be able to estimate the rate of E.S.R

a- Examinations (question design):

b- **Fill in the blanks:**

c- Samples fixed in formalin must be washed with ……..

d- Parrafin wax embedded tissue knives are made of ……..

Why?

1- It is necessary to cut and preserve sections from a tissue or specific area?

2- Cover slipping is done?

External Evaluator