

(Histopathological technique) Course Catalogue

2022-2023

College/ Institute	Shaqlawā technical Institute	
Department	Medical Laboratory Technology	
Module Name	Histopathological techniques	
Module Code	HIT 204	
Semester	2	
Credit	6	
Module type	Core	
Weekly hours	4	
Weekly hours (Theory)	(2)hr Class	()hr Workload
Weekly hours (Practical)	(2)hr Class	()hr Workload
Lecturer (Theory)	Azhin S. Ali	
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Course Book

Course overview:

This course which consists of (2) hours lecture & (2) hrs lab. per week for (12) weeks, is an introduction to techniques related to Histology and Histopathology and Preparing microscopically slides from body fluids and tissues.

Course objective:

The purpose of this course is to introduce the students to histopathological techniques, exfoliative cytology & their diagnostic significance, also how to getting knowledge about how to take (histological specimens) from human and Definition of (biopsy) & (autopsy) specimens & 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. They also do reports, seminars and bulletins.

Forms of teaching

lecture halls with data show equipment for lecture presentations and white board during theoretical part, and doing experiment during practical parts

Assessment scheme

6% Mid. Theory exam
10% Mid. practical exam
4% Quiz
40% Activity
25% final practical
15% final theory

Specific learning outcome:

On successful completion of this program, graduates will be able to

- 1- Identify evaluate and apply major theoretical traditions in human histology
- 2- Understand how the slides are prepared from different tissues and fluids in the body.
- 3- Could be able to prepare all working solutions.
- 4- Preservation and fixation of all histological specimens.
- 5- Techniques for medical museum.
- 6- Personal safety.

Course Reading List and References:

1. Handbook of Histopathological and Histochemical Techniques (including museum techniques)
THIRD EDITION C. F. A. CULLING
2. Microtomy and Paraffin Section Preparation by Scientia.
3. Pathology (practical book), Third edition, 2013, by Harsh Mohan.

- Course topics (Theory)	Week	Learning Outcome
<p>Definitions of histopathology, histology & pathology</p> <p>Explanation about Histopathological techniques in general</p> <p>understanding the difference between these sciences</p> <p>aim of Histopathological techniques</p>	First week	<p>Able to knowing the general information about this module and definition of some related concepts</p> <p>And How to be prepared for this course requirements</p>
<p>How to obtain (histological specimens) from human</p> <p>Definition of (biopsy) & (autopsy) & the difference between them.</p>	Second week	<p>Able to know how biopsy will obtain from patients</p>
<p>The steps of preparation of histological slides& the name of each step</p> <p>Gross examination</p> <p>Fixation: definition, purpose, classification of fixatives</p> <p>And principle of Fixation</p>	Third week	<p>Must be able to knowing all the steps of Histological technique in general and detailed information about fixation process</p>
<p>Declassifications: definition, purpose, classification of declassifiers</p> <p>And principle of decalcifications</p>	Forth week	<p>Must be able to knowing detailed information about declassifications process</p>
<p>Dehydration: definition, purpose, the solutions use, the factors affecting this process</p> <p>Clearing: definition, aim, solutions used, characteristics of clearing solutions, & the factors affecting this process</p>	Fifth week	<p>Must be able to knowing detailed information about Dehydration and Clearing process</p>

- Infiltration (impregnation) and embedding: definition, aim, substances used, types of paraffin wax& the factors affecting the process.	Sixth week	Be able to knowing detailed information about Infiltration (impregnation) and embedding
Sectioning: microtome, types (rotary, freezing, ultramicrotome),the difference in mechanism & uses for each	Seventh week	Be able to know all types of microtome and their purposes and how to use rotary microtome
Staining: definition, aim, and classification of stains, staining theory depending on their chemical reactions And mentioning of some special stains	Eighth week	Be able to know the types, names and principle of staining and some of different types of special stains
Pap smear	Ninth week	Must be informed about pap smear and where they can do this type of slide preparations
Frozen section	Tenth week	Must be able to knowing detailed information about Frozen section and purpose of it
Immunohistochemistry technique	Eleventh week	Must be able to knowing general information about Immunohistochemistry technique and purpose of it
Electron Microscopic technique	Twelfth week	Must be able to knowing general information about Electron Microscopic technique and purpose of it
- Practical Topics (If there is any)	Week	Learning Outcome

<p>Introduction about:</p> <ol style="list-style-type: none"> 1- The equipment and solution required 2- The role of laboratory technologists 3- Personal safety. 	<p>First week</p>	<p>Be able to know their role of laboratory in lab. And brief information about equipment use during in histopathological technique</p>
<ol style="list-style-type: none"> 1- Different between whole mount, smear and tissue sections 2- Preparing some slides for microscopic examination 	<p>Second week</p>	<p>Be able to know and prepare a slides from different sources and examination under microscope Such as make a blood smear and detection of different types of blood cells in it</p>
<ol style="list-style-type: none"> 1- Could be able to prepare all working solutions 2- Preservation and fixation of all histological specimens. 3- Preparation of different concentration of alcohol & other solutions whether Vol/Vol or Weigh / Vol. 4- Hospital visit to see the preparation of these samples <p>Definition of each step of tissue preparation & the solution required for each step.</p>	<p>Third week</p>	<p>Be able to prepare fixation solution and put their biopsy in fixation step, be able to prepare different concentration of solutions</p>
<p>Dehydration: definition, purpose, the solutions use, the factors affecting this process Clearing: definition, aim, solutions used, characteristics of clearing solutions, & the factors affecting this process</p>	<p>Forth week</p>	<p>Be able to prepare dehydration solution and put their biopsy in dehydration step, be able to prepare different concentration of solutions</p>
<p>- Infiltration (impregnation) and embedding: definition, aim, substances used, types of paraffin wax& the factors affecting the process.</p>	<p>Fifth week</p>	<p>Be able to prepare clearing solution and put their biopsy in clearing step, be able to prepare different concentration of solutions</p>

<p>Sectioning: microtome, types (rotary, freezing, ultramicrotome), the difference in mechanism & uses for each and trimming and mentioning all materials used in this step</p> <p>Sectioning: definition, purpose with detail explanation for the rotary microtome.</p>	Sixth week	Being able to know how to use microtome and how to put section on slides
<p>Staining: definition, aim, and classification of stains, staining theory depending on their chemical reactions</p> <p>Staining tissue sections with routine stains (hematoxylin & eosin)</p> <p>Procedure of staining & preparation of staining solutions</p>	Seventh week	Being able to know how to prepare different solutions for staining and be familiar with staining procedure
<p>Detection of common errors in the work, & how to correct these errors.</p> <p>Common errors during the process of histological techniques particularly sectioning, causes and how to be avoided.</p>	Eighth week	Being able to know how to be familiar with the problems facing during Histological techniques and how to fix these problems Be able to focus on errors and how to deal with these errors
<p>Pap smear</p> <p>Cervical smear (pap smear)</p> <p>Specimen collection, fixative used, procedure & staining, results (normal or pathological)</p> <p>Normal cells, effect of inflammation on cell morphology, precancerous & cancerous changes.</p>	Ninth week	Be able to practice on how to prepare Pap smear an examination under light microscope
<p>Frozen section</p> <p>Cryostat</p> <p>Hospital visit to see the preparation of these samples</p>	Tenth week	Be able to knowing how to use Cryostat by visiting labs which have frozen techniques
<p>Immunohistochemistry technique</p>	Eleventh week	Be able how to use immunohistochemical kites (if it is available)
<p>Electron Microscopic technique</p>	Twelfth week	Be able to knowing how to prepare specimens for viewing

		under electron microscope.
Examinations (question design):		
Q/ Enumerate followings;		
<ol style="list-style-type: none">1. Dehydrating agents2. Factors affecting decalcification time3. Mounting media4. cytological fixative		
Q/ Answer the followings:		
<ol style="list-style-type: none">1. Write principle of fixative.2. How temperatures affect decalcification time in histological technique? Write it in detail.3. Mention 3 properties of best fixative.		
External Evaluator		