Republic of Yemen

Ministry of Higher Education & Scientific Research

21 SEPTEMBER UNIVERSITY of MEDICALS & APPLIEED

SCIENCES

Faculty of Laboratory medicine..

Department of Pathology

Course Specification of Histopathology and Micro technique
Course No. (01.01.306)

Prepared by:	Reviewed by:	Head of the Department:	Vice Dean for Quality affairs	Dean of College:
Dr. Aref Saleh Abdulmughni	Dr Gamil Taher Abdul Mughni		Dr\Gamil Taher Abdul Mughni	Associate Prof. Dr. Ebtesam Al-Zabedi

I. Course Identification and General Information:

1	**Course Title:**	Histopathology and Micro technique			
2	**Course Code & Number:**	01.01.306			
3	**Credit Hours:**	**Theory Hours**			
		Lecture	**Exercise**	Practical	**Credit Hours**
		2	0	2	3
4	**Study Level/ Semester at which this Course is offered:**	3th Level / 2nd Semester			
5	**Pre –Requisite (if any):**	Pathology			
6	**Co –Requisite (if any):**	None			
7	**Program (s) in which the Course is Offered:**	Faculty of Laboratory medicine			
8	**Language of Teaching the Course:**	English			
9	**Study System:**	semester			
10	**Mode of Delivery:**	Regular			
11	**Location of Teaching the Course:**	University Campus			
12	**Prepared by:**	Dr. Aref Saleh Mohammed Abdulmughni			
13	**Date of Approval:**	2023			

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II. II. Course Description:

This course will provide the students with Basic knowledge of the theoretical and applied aspects of tissue specimen's collection and preparation techniques, ability to perform the different histopathological techniques as well as the knowledge and ability to perform routine and special tissue staining techniques

III. Alignment Course Intended Learning Outcomes with program outcomes

III. Course Intended Learning Outcomes (CILOs)		Referenced PILOs
A. Knowledge and Understanding: ***Upon successful completion of the course, students will be able to:***		
a 1	**Describe** in detail the microscopic structure of the major organs, tissues and cells of the body	**A1**
B. Intellectual Skills: ***Upon successful completion of the course, students will be able to:***		
b1	**Develop** critical and analytical thinking to recognize errors and solve problems in the preparation of routine formalin-fixed, paraffin-embedded tissue sections, haematoxylin and eosin staining, selected special stains and immunohistochemical methods	**B1**
C. Professional and Practical Skills: ***Upon successful completion of the course, students will be able to:***		
c1	**Perform** tissue fixation, tissue processing, tissue embedding and tissue sectioning as well as routine and special staining proficiently.	**C1**
D. Transferable Skills: ***Upon successful completion of the course, students will be able to:***		
d1	Relate details of the microscopic structure of the major organs, tissues and cells of the body	**D1**

IV. Alignment Course Intended Learning Outcomes with Teaching Strategies and Assessment methods :

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(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:			
	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	**Discuss** the the principle and purposes of fixation, different steps of tissue processing, routine tissue staining as well as immunohistochemical technique	Lecture	Exam
(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:			
	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	Develop critical and analytical thinking to recognize errors and solve problems in the preparation of routine formalin-fixed, paraffin-embedded tissue sections, haematoxylin and eosin staining, selected special stains and immunohistochemical methods	Lecture	Exam
C Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:			
	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1	**Perform** tissue fixation, tissue processing, tissue embedding and tissue sectioning as well as routine and special staining proficiently	Laboratory practical	Practical Exam
(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:			
	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1	Relate details of the microscopic structure of the major organs, tissues and cells of the body	Lectures	seminars

V. Course Content:

A – Theoretical Aspect:

NO.	Units/Topics List	Number of Weeks	contact hours	Learning Outcomes (CILOs)	
1	Definitions of (histological techniques)	1	2	b1	

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	(exfoliative cytology) & their diagnostic significance. Definition of (microtechnique) (histology)(cytology) & understanding the difference between these sciences & microtechnique.				
2	How to obtain (histological specimens) from human & animals. Definition of (biopsy) & (autopsy) & the difference between them.	1	2	a1, b1	
3	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 solution6- Helly´ s & Carnoy's s solutions with the advantages & disadvantages of each solution.	1	2	a1	
4	The process of (washing) the specimens. Definition, aim, the solutions used &the time.	1	2	b1, c1	
5	4 Dehydration: definition, aim, the solutions used, & the time.	1	2	a1, b1	
6	Clearing: definition, aim, solutions used, characteristics of clearing solutions, & the factors affecting this process.	1	2	b1	
7	Infiltration (impregnation): definition, aim, substances used, types of paraffin wax& the factors affecting the process	1	2	a1, b1, c1	
8	MED TERM	1	2	b1	
9	Sectioning: microtome, types (rotary, freezing, ultramicrotome), the difference in mechanism & uses for each Substances used to support the tissue during sectioning, section thickness, and type of fixative…. & other differences.	1	2	a1, b1	

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10	Common errors during sectioning, causes & the solution.	1	2	a1, b1	
11	Staining: definition, aim, and classification of stains, staining theory depending on their chemical reactions, origin, methods of staining (direct & indirect staining)	1	2	b1, c1	
12	Stain solvents, factors affecting staining process, storage, & the choice of appropriate stain	1	2	a1, b1	
13	Definitions of: mordant, accelerator, counter stain, differentiation, Bleaching, basophilic stain, acidophilic stain, metachromasia.Nov.1712 Routine stains: definition, aim, examples like hematoxylin & eosin. Common types of hematoxylin & method of preparation.	1	2	a1,, b1	
14	Special stains: definition, aim, examples like Verhoeff´ s stain & Bests Carmine stain Dec.	1	2	a2, b1, c1	
15	Preparation of microscopical slide from bone tissue: the fixatives used, decalcification, & decalcifying solution, & chemical indicators for end of decalcification	1	2	a2, , b1, c1	
16	Electron microscope: principle of action, uses, and fixatives used difference from light microscope, section thickness …etc	1	2	a1, b1, c1	
	Total	**16**	32		

B - Practical Aspect: (if any)

Order	Tasks/ Experiments	Number of Weeks	contact hours	Learning Outcomes
1	**Introduction, arrangement, use of lab. instruments. Microscopy. Safety in the Lab**	**1**	**2**	**c1**

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2	**Preparation of chemicals, fixatives. Microtome**	**1**	**2**	**c1**
3	Preparation of human blood smear	**1**	**2**	**c1**
4	Tissue processing: Tissue extraction, and fixation	**1**	**2**	**c1**
5	Tissue processing: Dehydration, infiltration and embedding	**1**	**2**	**c1**
6	**Tissue processing: Trimming, sectioning and mounting**	**1**	**2**	**c1**
7	**Tissue processing: Trimming, sectioning and mounting**	**1**	**2**	**c1**
8	**Tissue processing: Staining of sections, mounting & cleaning**	**1**	**2**	**c1**
9	**Tissue processing: Staining of sections, mounting & cleaning**	**1**	**2**	**c1**
10	**Examination of slides. Labeling and evaluation**	**1**	**2**	**c1**
11	**Tissue processing: Staining of sections, mounting and cleaning**	**1**	**2**	**c1**
12	**Submission of lab reports and slides**	**1**	**2**	**c1**
13	**Cryosectioning: Instruments used**	**1**	**2**	**c1**
14	**Preparation of tissues for electron microscopy: Visit to the E.M. Lab**	**1**	**2**	**c1**
15	**Cleaning of glassware & instruments. Practical Final Exam.**	**1**	**2**	**c1**
Number of Weeks /and Units Per Semester		**15**	**30**	

V. Teaching Strategies of the Course:	
1-	Lectures:
2-	practical session
3-	Seminars

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VI. Assessment Methods of the Course:

No	Assignment
1	Written Exams (Short Essays) and Quizzes
2	Multiple Choice Questions (MCQ)
3	Practical Exams (PE)

VII. Assignments:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	**Midterm Exam**	6	20	20%	a1,b1,c1
2	**Practical exam**	12	30	30%	a1,b1 ,c1,d1
3	**Final Exam**	14	50	50%	a1,b1, ,c1
	Total	100		100%	

X. Learning Resources:

1- Required Textbook(s)

1-	Robbin's Pathologic Basis of Diseases
2-	Textbook of Human Histology (4th Edition) Inderbir Singh Jaypee Brother, 2002

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2- Essential References.	
1-	Walter and Israel's General Pathology
2-	Text-Book of Pathology by Harsh Mohan
3- Electronic Materials and Web Sites *etc.*	
1-	British journal of anatomy
2-	Journal of clinical anatomy
3-	www.innerbody.com
4-	www.instantanatomy.net

X. Course Policies: (Based on the Uniform Students' By law (2007)

1	**Class Attendance:** Class Attendance is mandatory. A student is considered absent and shall be banned from taking the final exam if his/her absence exceeds 25% of total classes.
2	**Tardiness:** A student will be considered late if he/she is not in class after 10 minutes of the start time of class.
3	**Exam Attendance/Punctuality:** No student shall be allowed to the exam hall after 30 minutes of the start time, and shall not leave the hall before half of the exam time has passed.
4	**Assignments & Projects:** Assignments and projects must be submitted on time. Students who delay their assignments or projects shall lose the mark allocated for the same.
5	**Cheating:** Cheating is an act of fraud that results in the cancelation of the student's exam or assignment. If it takes place in a final exam, the penalties stipulated for in the Uniform Students' Bylaw (2007) shall apply.
6	**Forgery and Impersonation:** Forgery/Impersonation is an act of fraud that results in the cancelation of the student's exam, assignment or project. If it takes place in a final exam, the penalties stipulated for in the Uniform Students' Bylaw (2007) shall apply.

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7	**Other policies:** The University official regulations in force will be strictly observed and students shall comply with all rules and regulations of the examination set by the Department, Faculty and University Administration.

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