



Paramedical Program

Specialization	Medical Laboratories
Course Number	020807131
Course Title	Histology & micro techniques.
Credit Hours	(3)
Theoretical Hours	(2)
Practical Hours	(3)



❖ تطبق هذه الخطة الدراسية اعتباراً من بداية العام الجامعي 2009/2008



Brief Course Description:

This course introduces the students to the cells and tissues arrangements of the human body. It deals with the study of the micro-anatomical structure and function of the body's major organs. It exposes the students to the principles and practices of preparing clinical specimens for histological examination. The focus is put on the procedures used in fixation, decalcification, processing, embedding and microtomy of specimens. Emphasis is also put on the principles and practices used in a laboratory for demonstrating cellular and non-cellular elements in clinical histology specimens.

Course Objectives:

Upon the completion of the course, the student should be able to:

1. Recognize the basic cells and tissues of the human body.
2. Recognize the histological features of the circulatory and lymphatic systems.
3. Recognize the histological features of the respiratory system.
4. Recognize the histological features of the digestive system.
5. Recognize the histological features of the urinary system.
6. Recognize the histological features of the reproductive system.
7. Recognize the histological features of the endocrine system.
8. Recognize the histological features of the integumentary system.
9. Describe the initial preparation of clinical specimens for histological examination, their storage and/or disposal.
10. Describe fixation and decalcification procedures.
11. Describe paraffin processing.
12. Describe the process for embedding clinical histological specimens.
13. Describe the procedure for cutting clinical histological specimens.
14. Discuss the principles of staining.
15. Perform a routine H&E (Hematoxylin and Eosin) to demonstrate general morphology.
16. Perform special staining techniques to demonstrate specific tissue elements.





Detailed Course Description:

Unit Number	Unit Name	Unit Content	Time Needed
1	Introduction	-Definition of histology -The Cell: a)Structure b)Division -Types of tissue	
2	Epithelial tissue	-Types -Function -Location in body -Changes of Epithelial tissue: Gland structure & parts: a) Endocrine b)Exocrine	
3	Connective tissue	1-Properties & function 2-Classification: -Adipose tissue -White fiber tissue -Elastic fiber tissue -Aereolar tissue - Reticular tissue -Lymph tissue -Cartilage tissue -Bone tissue -Blood vessels & lymph	
4	Muscular tissue	1-Classification of muscles : - Skeletal muscle - Smooth muscle - Cardiac muscle 2-Structure of muscular tissue	

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5	Nervous tissue	<p>1- Structure of nervous tissue</p> <ul style="list-style-type: none"> -Nerves fiber -The Nerve -Brain nerves -Brain & spinal cord <p>2- Function</p>	
6	Microscopic structure of organs	<ul style="list-style-type: none"> - Veins and Arteries microscopy - Gastrointestinal tract , accessories gland as liver , pancreas and spleen - Kidney - Ovarv & Testes - Skin - Lymph gland - Thymus gland 	
7	<p>Practical part</p> <p>Fixation</p>	<p>Definitions:</p> <p>Definition</p> <p>a-Fixation b-Autolysis c-Putrefaction</p> <p>2-Classification of fixation :</p> <ul style="list-style-type: none"> a- Simple b- compound <p>3-Fixatives like :</p> <ul style="list-style-type: none"> a- Formalin , b- Glacial acetic acid , c-Ethyl alcohol , d-Mercuric chloride e-Picric acid , f-Chromic acid , g-Potassium dichromate , h-Trichloroacetic acid,d- osmium tetroxide 	
8	<p>Decalcification</p> <p>&</p> <p>Tissue processing</p>	<ol style="list-style-type: none"> 1. Decalcification methods 2. Decalcification solutions : <ul style="list-style-type: none"> a-Nitric acid ,b- Formic acid. 3.End process recognition 	



		<ol style="list-style-type: none"> 1- Tissue processing definition & solutions used 2- Processing : <ol style="list-style-type: none"> a) Washing b) Dehydration c) Clearing d) Impregnation e) Embedding 3- Automatic tissue processor 	
9	Microtome	<ol style="list-style-type: none"> a-Microtome types <ul style="list-style-type: none"> -Rotatory microtome , part of machine b-Knife types , Knife sharpening c-Sectioning Trouble shooting 	
10	Staining	<ol style="list-style-type: none"> 1- Factors that effect staining 2- Types & classification of dyes <ol style="list-style-type: none"> a-Haematoxylin b-Eosin stain 3- Automated stain machine 4- Special stains : <ul style="list-style-type: none"> -Reticular fiber stain - Trichrome stain -Pearls iron stain - Mucicarmine - PAS - Alcian blue stain - lipid stain - AFS - PTAH - Melanin stain - Lead salt -Verhoeffs method - Amyliod stain - Oil red (O) - Fontana -Immunological stains 	



		<ul style="list-style-type: none"> - Calcium , -Copper , -Silver stain 	
11	Mounting & Tissue freezing	<p>1-Mounting</p> <ol style="list-style-type: none"> 1- Mounting types & specification 2- Goals of mounting 3- Mounting procedures 4- Labeling of slides & storing <p>2-Freezing</p> <ol style="list-style-type: none"> 1. Fast freezing types 2. Cryostat machine 3. Fast stain solution 	
12	Cytological smears	<ol style="list-style-type: none"> 1- Cytology sample : <ul style="list-style-type: none"> -collection - Specification 2- Smear preparation , fixation & staining 3- Cytology stain types :a- PAPA Nicolou ,b-Wright stain c- H&E stain 	



**Evaluation Strategies:**

Exams		Percentage	Date
Exams	First Exam	20%	--/--/----
	Second Exam	20%	--/--/----
	Practical Exam	10%	--/--/----
	Final Exam	35%Theory 15%Practical	--/--/----

Teaching Methodology: ❖ Lectures
❖ Slides and posters ❖ Practice inside labs

Text Books & References: Reference

- 1- A;L. Mescher, 2016, Junquera's Basic Histology Text & Atlas 14th ed, McGraw Hill, N.Y.
- 2- Netter's Essential Hist. 2013 2nd ed W. Oralle, PoNahirewy. Saunders Elsevier, USA
- 3- Wheater's Functional Hist.; A text A colour Atlas, 6th ed. 2014. Borbara Young, Geraldine ODowd & Philip Woodford. Churchill Livingstone.
- 4- Histology; A text & Atlas, 7th ed. 2016. Wojciech Pawlina. Wolters Kluwer.



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