

COURSE PLAN

FIRST: BASIC INFORMATION

College

College : Medicine
 Department : Basic Medical Sciences

Course

Course Title : Introduction to pathology
 Course Code : 31504205
 Credit Hours : 3
 Prerequisite : None

Instructor

Name : Ali Al Khader Course coordinator
 Office No. :
 Tel (Ext) : 3574
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 Office Hours :

Class Times

Buiding	Day	Start Time	End Time	Room No.
Lecture Hall Complex				
Labs				

Text Books

**Basic Pathology, by Kumar, Cotran and Robbins, Latest edition.
 Handouts prepared by the lecturers**

SECOND: PROFESSIONAL INFORMATION

COURSE DESCRIPTION

This course covers the study of cell injury including its causes, mechanisms, morphologic alterations and cellular death, adaptations of cellular growth and differentiation, Inflammation including its types, causes, morphologic features and mechanisms, tissue renewal, regeneration, and repair, hemodynamic disorders including edema, hyperemia, congestion, thrombosis, embolism infarction and shock, neoplasia including nomenclature and characteristics of benign and malignant neoplasms

COURSE OBJECTIVES

By the end of this course, students are expected to:

- Understand cellular responses to stress and toxic insults.
- Understand adaptations of cellular growth and differentiation (Hypertrophy, Hyperplasia, atrophy and Metaplasia)
- Know causes of cell injury and morphologic alterations in cell injury (reversible injury, necrosis).
- Know mechanisms of cell injury.
- Understand ischemic-reperfusion Injury
- Understand apoptosis (causes of apoptosis, morphologic and biochemical changes, mechanisms).
- Know autophagy, intracellular accumulations, pathologic calcification and cellular aging.
- Know acute Inflammation (Stimuli, reactions of blood vessels and leukocytes, termination morphologic patterns and outcomes).
- Know mediators of inflammation
- Know chronic inflammation (Causes, morphologic features, granulomatous inflammation and outcomes).
- Know systemic effects of inflammation.
- Understand tissue renewal, regeneration, and repair.
- Understand cell cycle and the regulation of cell replication.
- Know mechanisms of tissue and organ regeneration, extracellular matrix and cell-matrix interactions, healing by repair, scar formation and fibrosis.
- Know hemodynamic disorders including edema, hyperemia and congestion, hemorrhage, hemostasis and thrombosis, embolism, infarction and shock.
- Understand neoplasia (Nomenclature, Characteristics of Benign and Malignant Neoplasms, Epidemiology, Molecular basis of cancer and multistep carcinogenesis, Carcinogenic agents and their cellular interactions, Clinical aspects, Grading and staging of tumors, and Laboratory diagnosis of cancer).

COURSE LEARNING OUTCOMES

- 1) Knowledge and Understanding
 1. The cellular responses to stress and toxic insults.
 2. Adaptations of cellular growth and differentiation (Hypertrophy, Hyperplasia, atrophy and Metaplasia)
 3. Causes of cell injury and morphologic alterations in cell injury (reversible injury, necrosis).
 4. Mechanisms of cell injury.
 5. Ischemic-reperfusion Injury
 6. Apoptosis (causes of apoptosis, morphologic and biochemical changes, mechanisms).
 7. Autophagy, intracellular accumulations, pathologic calcification and cellular aging.



8. Acute Inflammation (Stimuli, reactions of blood vessels and leukocytes, termination morphologic patterns and outcomes).
 9. Mediators of inflammation
 10. Chronic inflammation (Causes, morphologic features, granulomatous inflammation and outcomes).
 11. Systemic effects of inflammation.
 12. Tissue renewal, regeneration, and repair.
 13. Cell cycle and the regulation of cell replication.
 14. Mechanisms of tissue and organ regeneration, extracellular matrix and cell-matrix interactions, healing by repair, scar formation and fibrosis.
 15. Hemodynamic disorders including edema, hyperemia and congestion, hemorrhage, hemostasis and thrombosis, embolism, infarction and shock.
 16. Neoplasia (Nomenclature, Characteristics of Benign and Malignant Neoplasms, Epidemiology, Molecular basis of cancer and multistep carcinogenesis, Carcinogenic agents and their cellular interactions, Clinical aspects, Grading and staging of tumors, and Laboratory diagnosis of cancer).
- 2) Professional Skills
The student should be able to differentiate the morphological and clinical applications.
- 3) Competences (Transferable skill and attributes)
The student should be able to correlate the four aspects of disease with clinical diagnosis

COURSE SYLLABUS

No	Title of lectures	Learning Objectives
	1st week	
1	Introduction	<ul style="list-style-type: none"> - Course orientation - Overview: Cellular responses to stress and noxious stimuli
2	Cellular responses to stress (1)	Adaptations of Cellular Growth and Differentiation: <ul style="list-style-type: none"> - Hypertrophy - Hyperplasia - Atrophy - Metaplasia
	Lab 1	Cellular adaptations
	2nd week	

3	Cellular responses to stress (2)	<ul style="list-style-type: none"> - Causes of cell injury - Morphologic alterations of cell injury (reversible injury, necrosis)
4	Cellular responses to stress (3)	<ul style="list-style-type: none"> - Mechanisms of cell injury (Depletion of ATP, Mitochondrial damage, influx of calcium and loss of calcium homeostasis, oxidative stress, defects in membrane permeability, damage to DNA and proteins) - Selected examples of cell injury and necrosis (Ischemic and hypoxic Injury, ischemic-reperfusion Injury, chemical (TOXIC) Injury)
	Lab 2	Necrosis and apoptosis
	3rd week	
5	Cellular responses to stress (4)	Apoptosis (causes, morphologic and biochemical changes, mechanisms, clinic-pathologic correlations: apoptosis in health and disease)
6	Cellular responses to stress (5)	<ul style="list-style-type: none"> - Autophagy - Intracellular Accumulations (lipids, proteins, Hyaline changes, glycogen, and pigments) - Pathologic Calcification (Dystrophic calcification and metastatic calcification) - Cellular Aging
	Lab 3	Cellular accumulations
	4th week	
7	Inflammation (1)	<ul style="list-style-type: none"> - Overview of inflammation - Acute Inflammation (Stimuli for acute inflammation, reactions of blood vessels in acute inflammation)
8	Inflammation (2)	<ul style="list-style-type: none"> - Reactions of leukocytes in inflammation - Termination of the acute inflammatory response
	Lab 4	Acute inflammation
	5th week	
9	Inflammation (3)	<ul style="list-style-type: none"> - Mediators of Inflammation/ Cell-derived mediators
10	Inflammation (4)	<ul style="list-style-type: none"> - Mediators of Inflammation/ plasma-proteins derived mediators - Outcomes of Acute Inflammation - Morphologic Patterns of Acute Inflammation (Serous

		inflammation, fibrinous inflammation, suppurative or purulent inflammation and ulcers)
	Lab 5	Chronic inflammation
	6th week	
11	Inflammation (5)	<ul style="list-style-type: none"> - Chronic Inflammation (Causes of chronic inflammation, morphologic features, role of macrophages and other cells in chronic inflammation, granulomatous inflammation) - Granulomatous inflammation - Consequences of Defective or Excessive Inflammation
12	Tissue repair (1)	<p>Control of normal cell proliferation and tissue growth:</p> <ul style="list-style-type: none"> - Tissue proliferative activity - Stem cells (reprogramming of differentiated cells, embryonic stem cells, Adult (Somatic) stem cells, stem cells in tissue homeostasis)
	Lab 6	Selected examples of inflammation
	7th week	
13	Tissue repair (2)	<p>Cell Cycle and the Regulation of Cell Replication:</p> <ul style="list-style-type: none"> - Growth factors - Signaling mechanisms in cell growth (Receptors and signal transduction pathways, transcription factors)
14	Tissue repair (3)	<ul style="list-style-type: none"> - Mechanisms of Tissue and Organ Regeneration/Liver regeneration - Extracellular Matrix and Cell-Matrix Interactions (Collagen, elastin, fibrillin, and elastic fibers, Cell adhesion proteins, Glycosaminoglycans (GAGS) and proteoglycans)
	Lab 7	Granulation tissue, Ulcers and fibrosis including keloid
	8th week	
15	Tissue repair (4)	<p>Healing by Repair, Scar Formation and Fibrosis:</p> <ul style="list-style-type: none"> - Mechanisms of angiogenesis - Cutaneous wound healing (formation of blood clot, formation of granulation tissue, cell proliferation and collagen deposition, scar formation, wound contraction and

		connective tissue remodeling) - Local and systemic factors that influence wound healing. - Pathologic aspects of repair/fibrosis
	Midterm exam (40% theory, 10% practical)	10-12 am
	9th week	-
16	Hemodynamic disorders (1)	- Edema - hyperemia and congestion - Hemorrhage - Hemostasis
17	Hemodynamic disorders (2)	- Thrombosis - Embolism
	Lab 8	Atherosclerosis, thrombosis and embolism
	10th week	
18	Hemodynamic disorders (3)	- Infarction - Shock
19	Neoplasia (1)	- Nomenclature. - Characteristics of Benign and Malignant Neoplasms (Differentiation and anaplasia, Rates of growth, cancer stem cells and cancer cell lineages, local invasion, metastasis and Pathways of Spread) - Epidemiology (cancer incidence, geographic and environmental factors, age, genetic predisposition to cancer, nonhereditary predisposing conditions)
	Lab 9	Selected examples of dysplasia
	11th week	
20	Neoplasia (2)	Molecular Basis of Cancer: - essential alterations for malignant transformation - Oncogenesis - evasion of apoptosis - Telomerase - Angiogenesis - invasion and metastasis - stromal microenvironment and carcinogenesis



		- metabolic alterations.
21	Neoplasia (3)	- tumor suppressor genes
	Lab 10	Selected examples of benign neoplasms
	12th week	
22	Neoplasia (4)	- Molecular Basis of Multistep Carcinogenesis - Chemical carcinogenesis - radiation carcinogenesis - microbial carcinogenesis
23	Neoplasia (5)	- Host Defense against Tumors—Tumor Immunity and evasion of immune system - Clinical Aspects of Neoplasia/ Local and Hormonal Effects, Cancer Cachexia, Paraneoplastic Syndromes.
	Lab 11	Selected examples of malignant neoplasms
	13th week	
24	Neoplasia (6)	- Grading and Staging of tumors. - Laboratory Diagnosis of Cancer (Histologic and Cytologic Methods, Immunohistochemistry, Flow Cytometry, Molecular Diagnosis, Molecular Profiles of Tumors, Tumor Markers)
25	Amyloidosis	Basic principles
26	Revision	Pre final revision
Final Exam (35% Theory + 15% Practical)		

COURSE LEARNING RESOURCES

Lectures, Labs, and video sessions

ONLINE RESOURCES

WebPath

ASSESSMANT TOOLS

(Write assessment tools that will be used to test students ability to understand the course material and gain the skills and competencies stated in learning outcomes)

ASSESSMENT TOOLS	%
Mid Exam (Theory)	40
Mid Exam (Practical)	10
Final Exam (Theory)	35
Final Exam (Practical)	15
TOTAL MARKS	100

THIRD: COURSE RULES

ATTENDANCE RULES

Attendance and participation are extremely important, and the usual University rules will apply. Attendance will be recorded for each class. Absence of 10% will result in a first written warning. Absence of 15% of the course will result in a second warning. Absence of 15% or more will result in forfeiting the course and the student will not be permitted to attend the final examination. Should a student encounter any special circumstances (i.e. medical or personal), he/she is encouraged to discuss this with the instructor and written proof will be required to delete any absences from his/her attendance records.

Use of Mobile Devices, Laptops, etc. During Class, unexpected noises and movement automatically divert and capture people's attention, which means you are affecting everyone's learning experience if your cell phone, laptop, etc. makes noise or is visually distracting during class. For this reason, students are required to turn off their mobile devices and close their laptops during class.

REMARKS

{The instructor can add any comments and directives such as the attendance policy and topics related to ethics}.

COURSE COORDINATOR

Course Coordinator: Dr. Ali Al Khader - Department of Basic Sciences

Signature:

Signature:

Date: Date: