

Department of Anatomy
College of Medicine
King Saud University

C O U R S E 281
(Anatomy/Histology)
For Pharmacy Students

Student Guide

Introduction:

This specially designed course for the pharmacy students of King Saud University, Riyadh, Saudi Arabia, is intended to provide an introduction to Basic human Anatomy. The course is divided into two parts:

- I. **Morphology (Gross Anatomy)**
- II. **Histology**

Course Objectives:

Morphology: The course is designed to provide:

- The student with the knowledge of different systems working in human body.
- The student with the knowledge of different structure with their relations to each other.

Histology: The course is designed to:

- Provide the student with a basic knowledge of the structure of the cell, their components and functions.
- Correlate the microscopic structure of individual tissue component and organs with their functions.

Helpful Suggestions:

Students often find anatomy a difficult subject to learn. There are several possible reasons for this of course, one of which is the terminology. Students are exposed to many new words that are unfamiliar and structures may often have more than one name. Learning anatomy has sometimes been analogized to learning a new language. Rather than attempting to learn anatomy simply by memorization, students are encouraged to become familiar with the meaning of each word (usually Greek or Latin derivation) when first encountered. Also relating function and clinical associations with a structure often helps with understanding and remembering.

Follow the entire laboratory instructions given by your instructor. Examine all of the specimen/models provided. It is helpful to get a theoretical understanding of an area before attempting to locate a search for a specific structure or structures. Focus on the essential features of each region and develop a mental picture of what structures look like and their relationships. Always keep up to date with the subject matter and try to come to labs/lectures regularly. Constantly refer to your textbook and be sure to ask your instructors for assistance if you don't understand the material.

It is not only advisable but essential that you examine many different specimens whenever available noting how they differ from textbook descriptions and from one another.

Don't be afraid to ask questions in labs/lectures. Remember the Chinese proverb. "**He who asks is a fool for five minutes, but he who does not remains a fool forever**". We want to be helpful and hope you find the course worthwhile.

Course Textbook for Morphology:

Essentials of Human Anatomy and Physiology
Written by: Elaine N Marieb, 7th Edition
Published by Benjamin Cummings

Course Textbook for Histology:

Color Atlas of Histology
Written by: L.P. Gartner and J.L. Hiatt (3rd Edition)

Advice to Students:

- 1) Read the recommended textbook as shown in the "Reference" column of course schedule for each lecture before coming to class.
- 2) Regularly attend all classes and practicals, regularly assess yourself whether you are running along with the program or lagging behind.
- 3) You must actively participate in all activities in the laboratory.
- 4) You can contact any of the teaching staff if you have questions or difficulties in the course.

(A) TIMETABLE: (4 hours every week)**Lectures:**

DAYS	TIME	LECTURE THEATRE
Morphology/Histology (Monday/Wednesday)	11:00 AM – 12:00 PM	Room 2A 115 College of Pharmacy
Morphology/Histology (Monday/Wednesday)	1:00 PM – 2:00 PM	

Labs Every Alternate Next Week:

DAYS	TIME	LECTURE THEATRE
Morphology/Histology (Monday/Wednesday)	2:00 – 4:00 PM	DR Room/Histology Lab, Level 1, College of Medicine, KKHU

(B) Examinations:

NAME OF EXAM	NO. OF QUESTIONS	MARKS (TOTAL 100)	WEEK	TOPICS OF EXAM
1 st Continuous Assessment (only written)	Morphology (10)	20	6 th	Morphology: Introduction, Bones & Joints, Skeletal System & Muscular System,
	Histology (10)			Histology: The Cell, Epithelium, CT proper, Cartilage & bones & Muscular System
2 nd Continuous Assessment (Written & Practical)	Morphology (10+10)	40	11 th	Morphology: Nervous system, Cardiovascular system (I-II) & Respiratory System
	Histology (10+10)			Histology: Nervous tissue, Vascular system, Lymphoid tissue & Respiratory System
Final Examination (Written & Practical)	Morphology (10+10)	40	16 th – 17 th	Morphology: 70% Digestive system, Male & Female reproductive system & Urinary system, 30% 1 st & 2 nd CAE
	Histology (10+10)			Histology: 70% Digestive system, Urinary system 30% 1 st & 2 nd CAE

QUESTION FORMAT:

WRITTEN

- The question papers are based on multiple choice questions (MCQs). Each question will be followed by 5 statements either true or false.
- Each correct answered question = ONE Mark
- Each wrong answered question = - 1/4

PRACTICAL

- Identification of structure within the allotted time.
- Each correct answered question = ONE Mark **No negative marking**

ELIGIBILITY

- 70% attendance for fresh students
- 50% attendance for repeaters

DETAILS OF THE TOPICS TO BE DISCUSSED IN MORPHOLOGY LECTURES:

1) Introduction:

Anatomical terms (terms of position, direction and movements) planes, body cavities, classification and functions of bones.

2) Skeletal System:

Axial skeleton – main bones of cranium and face. Vertebral column as a whole, intervertebral disc, curvatures. Thoracic cage, parts of the sternum.

3) Appendicular Skeleton:

- Bones of shoulder, girdle (clavicle and scapula), general features of bones of upper and lower limbs. Articulate pelvis, differences between male and female pelvis. (Addition of x-rays in the practical for long bones and girdle bones).
- Classification of joints – (According to the structure), features of synovial joints.
- Classification of synovial joints into uniaxial, biaxial and multiaxial, types of joints with examples.

4) Muscular System:

Classification of muscles in brief introduction about skeletal muscles (tendon, aponeurosis, prime movers, antagonists origin and insertion). Naming of muscles, important muscles of face, neck, thorax, abdomen, upper and lower limbs.

5) Nervous System I:

Division of nervous system, Terms, Meninges & C. S. F. in brief, parts of the brain.

6) Nervous system – II

Spinal cord – Location, extent, cervical & lumbar enlargements, cranial nerves (names & functions in brief). Spinal nerves (formation of spinal nerve). Autonomic nervous system in brief.

7) Cardiovascular system – I

- Its functions & divisions. Pericardium.
- Heart - location, size, shape, chambers, apex beat or apical pulse,
- Brief account of systemic & pulmonary circulations. Valves, blood supply of heart.

8) Cardiovascular system – II

- Major Arteries & Veins of the body, Portal circulation & arteries of brain. pressure points
- Arterial pulse – carotid, brachial, radial, femoral & popliteal.

9) Respiratory system

- Nose – Functions, roof, floor, septum & lateral wall.
- Para nasal air sinuses & their functions.
- Pharynx – three parts, adenoids, palatine tonsil.
- Larynx – main cartilages, vocal folds, functions
- Trachea, bronchi & pleura in brief, lungs, names of respiratory muscles

10) Digestive system – I

Oral cavity, pharynx, esophagus, stomach, small & large intestines.

11) Digestive system – II

Accessory digestive organs – liver, gall bladder, pancreas, salivary glands, functions of saliva & teeth.

12) Urinary system

- Functions & organs of urinary system.
- Kidneys – location, size, shape, hilum, structures at the hilum. Functions of the kidney in brief. (Addition of X-rays in the practical for identification of kidney & ureter)
- Ureters – Abdominal & pelvic parts.
- Urinary bladder - size, shape, location, relations of posterior surface, internal & external urethral sphincters.
- Urethra - differences between male & female urethra.

13) Male reproductive system

- Testis – location, scrotal sac, tunica albuginea, seminiferous tubules, rete testis, functions of testis.
- Duct system – Epididymis, ductus deferens & urethra.
- Accessory glands, prostate & seminal vesicles.

14) Female reproductive system

- Ovaries – size& shape location, ovarian ligament, ovulation, hormones produced by the ovary.
- Duct system – fallopian tubes, uterus & vagina.

DETAILS OF THE TOPICS TO BE DISCUSSED IN MORPHOLOGY PRACTICALS:

1) Skeletal system:

- **Axial skeleton** – Main bones of cranium & face. Vertebral column as a whole, inter vertebral disc, thoracic cage, sternum.
- **Appendicular skeleton** – Bones of shoulder girdle (clavicle & scapula), general features of bones of upper & lower limbs. Articulated pelvis, differences between male& female pelvis.
- General classification of joints. Classification of synovial joints into uniaxial, biaxial & multiaxial types with examples

2) Muscles:

Classification of muscles in brief, (tendon, aponeurosis, prime movers, antagonists origin & insertion). Naming of muscles, important muscles of face, neck, thorax, abdomen, upper & lower limbs.

3) Nervous system:

Main nerves of upper & lower limbs, names of the cranial nerves, & parts of the brain.

4) Cardiovascular system:

Heart, great vessel, chambers of the heart, main arteries & veins of the upper & lower limbs, abdominal aorta, & inferior vena cava.

5) Respiratory system:

Nose – roof, floor, septum & lateral wall, para nasal air sinuses, pharynx, adenoids, palatine tonsil, larynx, trachea, bronchi, lungs, difference between left and right lung, & diaphragm.

6) Digestive system:

Oral cavity, pharynx, esophagus, stomach, small & large intestines, liver, gall bladder, pancreas, salivary glands & teeth.

7) Male reproductive system:

Testis, scrotal sac, epididymis, ductus deferens & urethra, prostate & seminal vesicles.

8) Female reproductive system:

Ovaries, ovarian ligament, uterus, fallopian tubes & vagina.

9) Urinary system:

Kidneys, hilum, structures at the hilum, ureter, abdominal & pelvic parts, urinary bladder, urethra, differences between male & urethra.

DETAILS OF THE TOPICS TO BE DISCUSSED IN HISTOLOGY LECTURES:

1) The cell

- Nucleus
- Nuclear envelope
- Chromatin
- Nucleolus
- Nuclear matrix (SAP)

Cytoplasm:

- Cytoplasmic organelles (membranous & non-membranous)
- Cell membrane
- Cell surface modifications

2) Epithelium

- Special characteristics
- Classification
- Epithelial membranes
- Glandular epithelium

3) **Connective tissue (C.T.) proper**

- General characteristics
 - Types:
 - ❖ Loose areolar C.T.
 - ❖ Dense C.T. e.g.: dense collagenous
 - ❖ Adipose C.T.
 - Cartilage
 - ❖ Hyaline
 - ❖ Elastic
 - ❖ Fibrocartilage
 - Bone
 - ❖ Cancellous (spongy) bone
 - ❖ Compact bone

4) **Muscular tissue:**

- Skeletal muscle
- Cardiac muscle
- Smooth muscle

5) **Nervous tissue:**

- Neuron (structure & classification)
- Neuroglial cell
- Peripheral nerve

6) **Vascular system:**

- Muscular (medium size) artery
- Veins

7) **Lymphoid tissue:**

- Lymph node
- Thymus

8) **Respiratory system:**

- Trachea
- Lung

9) **Digestive system I:**

- General architecture
- Fundus of stomach
 - Duodenum
 - Colon

10) **Digestive system II:**

- Liver
- Pancreas

11) **Urinary system:**

- Kidney
- Urinary bladder

DETAILS OF THE TOPICS TO BE DISCUSSED IN HISTOLOGY PRACTICALS:

General History Slides:

- **Epithelium:**
 - a) Simple cuboidal epithelium ex: thyroid
 - b) Simple columnar epithelium ex: stomach
 - c) Simple columnar epithelium with goblet cells ex: duodena
 - d) Stratified squamous nonkeratinized epithelium ex: esophagus
 - e) Stratified squamous: keratinized ex: skin
 - f) Transitional epithelium ex: urinary bladder
- **Connective tissue:**
 - a) Areolar C.T.
 - b) Adipose C.T.
 - c) Dense fibrous C.T. tendon
- **Cartilage**
 - a) Hyaline cartilage
 - b) Elastic cartilage
- **Bone:**
 - a) Compact bone T.S.
 - b) Spongy bone
- **Muscular tissue:**
 - a) Striated muscle (L.S.)
 - b) Cardiac muscle (L.S.)
 - c) Smooth muscle (L.S.)
- **Nervous tissue:**
 - a) Pseudo-unipolar neuron (e.g. spinal ganglion)
 - b) Multipolar neuron (e.g. sympathetic ganglion)
 - c) Peripheral nerve trunk

Systemic Histology Slides:

- **Lymphoid tissue:**
 - a) Thymus
 - b) Lymph node
- **Respiratory system:**
 - a) Trachea
 - b) Lung
- **Blood vessels:**
 - a) Artery & vein
- **Digestive system:**
 - a) Fundus of stomach
 - b) Duodenum
 - c) Colon
- **Digestive glands:**
 - a) Liver
 - b) Pancreas
- **Urinary system:**
 - a) Kidney
 - b) Urinary bladder

(A) TIMETABLE: (4 hours every week)

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(B) Examinations:

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