

University of Anbar

College Of Medicine



2018
2018

Curriculum of the Anbar College of Medicine



Prepared by curriculum committee

2018-2019

Curriculum of the Anbar College of Medicine

2018-2019

Chapter 3

Subjects for the annual system of the second stage

No.	Subject	Hours		Units
		Theory	practical	
1	Physiology	150	120	14
2	Biochemistry	90	60	8
3	Histology	45	90	6
4	Anatomy	60	150	9
5	Embryology	30	0	2
Total		435	420	39

Department of Physiology

Subject: Medical physiology

Second Year of M.B.CH.B. Program

Allocated marks	100 marks
Course duration	30 weeks (One Academic Year)
Total hours	150 Theoretical hours 120 Practical hours
Course coordinator	Ass. Prof. Dr. Maher Ali Jasim.
Teaching staff	<p>Theoretical teaching staff: Ass. Prof. Dr. Maher A. Jasim , Assist. Prof. Dr. -Waleed Nassar, Ass. Prof. Dr. Raid Muhmid Suhil, Ass. Prof. Dr. Thakir Mohammed, Lecturer Dr. Khalid Messer, Lecturer Dr. Wesam Alfehan, Lecturer Dr. Ansaf Ibrahim, Ass. Lecturer Dr. Latief Fayyadh, Ass. Lecturer Dr. Ahmad Talib, Ass. Lecturer Dr. Mohammed Ibrahim</p> <p>Practical Teaching Staff: Lecturer Dr. Ansaf Ibrahim, Ass. Lecturer Dr. Latief Fayyadh, Ass. Lecturer Dr. Ahmad Talib, Ass. Lecturer Dr. Mohammed Ibrahim</p> <p>Under Supervision Of The Above Theory Teaching Staff.</p>
Total	4 Assistant Professor,3 Lecturer , 3 ass. Lecturer

Introduction:

The study of physiology is, in a sense, the study of life. It asks questions about the internal workings of organisms and how they interact with the world around them.

Physiology tests how organs and systems within the body work, how they communicate, and how they combine their efforts to make conditions favorable for survival.

The Major Systems Covered In The Study Of Human Physiology Are As Follows:

- 1. INTRODUCTION TO PHYSIOLOGY (1 hour)**
Subject and significance, Methods of physiological research, Physiology and other sciences
- 2. FUNDAMENTALS OF GENERAL PHYSIOLOGY (5 hours)**
Cellular organization, Homeostasis, Body fluids, volume and distribution, Body water functions, Body fluid dynamics, Edema.
- 3. BLOOD PHYSIOLOGY (12 hours)**
Composition and function, The red blood cell , Hemoglobin and hemoglobin variants ,Iron metabolism , anemias, Destruction of the red blood cell ,The white blood cell , Morphology and classification, Specific functions of the different variants , The immune system, allergy, The platelets ,Homeostasis and blood coagulation, The plasma composition and function, the fibrinolytic activity of the plasma
- 4. PHYSIOLOGY OF THE MUSCLE (6 hours)**
Introduction types of muscles, Skeletal muscles, structure, motor units, Excitability, Mechanical response of the muscle, Simple muscle twitch, Type of contraction, muscle fatigue, Summation of muscle contraction, Effect of two muscle stimuli, Effect of repeated stimuli, Clonus and tetanus, All or none law, muscle tone, The sliding filaments theory, Thermal and chemical changes during muscle contraction, Blood groups and blood transfusion
- 5. PHYSIOLOGY OF THE NERVOUS SYSTEM (34 hours)**
PHYSIOLOGY OF THE NERVE FIBERS.
Properties of nerve fibers, Transmission along nerve fibers, Types of nerve fibers and compound action potential, Ionic theory of the membrane potential, Structure and type of nerve trunk, effect of cutting a motor nerve.

SYNAPTIC AND NEUROMUSCULAR TRANSMISSION.
Synaptic transmission, EPSP and IPSP, ionic bases, Convergence and divergence, spatial and temporal, Neuromuscular transmission and blocking substances.

THE AUTONOMIC NERVOUS SYSTEM
Introduction and definition, the autonomic reflex action and its comparison to the somatic reflex, Functional anatomy: sympathetic and parasympathetic system, The concept of membrane receptor, Chemical transmission in the autonomic nervous system, Function of the sympathetic and parasympathetic nervous system, Higher control of autonomic function: spinal, medullary, hypothalamic, limbic and cortical

BODY TEMPERATURE REGULATION

Normal temperature and set-point, Heat production, shivering and non-shivering thermogenesis, Heat loss, hypothalamic regulation of body temperature, Fever and hypothermia.

SENSATION

Introduction and definition, the stimulus and the adequate stimulus, sensory receptors, Classification of sensory receptors, electrical and ionic events in receptor potential, The sensory unit, the receptive field and cortical representation, Coding of sensory information, the sensory pathways, Role of proprioceptors in reflex and voluntary muscular contraction, The stretch (tendon) reflex, The Golgi tendon organ and the inverse stretch, Gamma efferent activity and muscle tone effect (lengthening reaction), Superficial deep and visceral sensation, Touch and pressure and sense vibration, Cold and warmth sensation, pain sensation ,Referred pain

SPECIAL SENSES

A) Hearing and equilibrium

Functional anatomy of the ear, Properties of the hearing system, Theories of hearing, Vestibular function

B) Vision

Functional anatomy of the eye, Errors of refraction: myopia, hyperopia and astigmatism. Physiology of the retina, visual fields and visual pathway, Visual accommodation and visual reflexes, visual acuity , Color vision, cerebral cortical visual function

C) Smell and taste.

Smell receptors and pathways, Physiology of olfaction, Taste receptor organs and pathways, Physiology of taste

CENTRAL NERVOUS SYSTEM

Physiology of the spinal cord reflexes, The cerebellum and its role in motor control and movement, Physiology of the hypothalamus and limbic system, The brain stem and reticular formation, Wakefulness and sleep ,Cerebral control function, motor functions and sensory function, Conditioned reflexes ,E.E.G, Speech, Memory

6. RESPIRATORY PHYSIOLOGY

(14 hours)

Functional anatomy, Lung volumes and capacities, Mechanics of breathing muscles of respiration, Pressure changes during the respiratory, Expansion of the lungs, Compliance. Airway resistance, Pulmonary circulation, Pressure low and resistance of pulmonary blood vessels, Alveolar ventilation, Distribution of ventilation and perfusion, Exchange of gases and diffusion capacity, Transport of oxygen by the blood ,Transport of carbon dioxide by the

blood, Control of ventilation, Hypoxia, hypercapnia and hypocapnia, Oxygen therapy, Effect of exercise, Artificial respirator, Non respiratory function of the lungs, Pulmonary function tests, total and regional, Patterns of breathing, normal and abnormal.

7. THE CARDIOVASCULAR SYSTEM (24 hours)

Introduction to cardiovascular physiology, Anatomical review, autonomic supply, Blood supply, Specialized tissue

THE MYOCARDIUM

Ultrastructure with comparison to skeletal muscle, Ionic role and bases of muscle contraction, excitation and contraction coupling, The mechanical properties of the cardiac muscle, Starling law of the heart (length-tension) relationship, types of muscle contraction, heart as a pump (contractility), The electrical activity of heart Action potential, fast response and slow response, The refractory periods, Pacemaker cells and pacemaker action potential

THE ELECTROCARDIOGRAPHY

General background, electrical axis PQRST waves and their clinical significance, the leads, Cardiac arrhythmias (block, Stokes-Adam Syndrome), Cellular basis of cardiac arrhythmias

CARDIAC OUTPUT

The cardiac function curve, The vascular function curve, Methods of measuring cardiac output, Factors regulating cardiac output

THE CARDIAC CYCLE AND HEART SOUNDS

Mechanism of sound, Abnormal sounds

PROPERTIES OF VASCULAR SYSTEM

Circulation, blood volume, haematocrit. Poiseuille's law, Ohm's law, Laplace law. Peripheral resistance, conductance, capacitance. Compliance, Laminar and turbulent flow, Reynolds numbers. Local regulation of blood flow, auto regulation control (intrinsic control) and neural control (extrinsic control). Regulations of blood pressure short and long term control, The pulse pressure, systolic blood pressure, diastolic blood pressure and the Korotkoff sounds

THE VEINS AND THEIR FUNCTIONS

General venous pressure and its regulation. Venous pump, reference point, the filling pressure

HYPOTENSION AND SHOCK

Transient hypotension, prolonged hypotension and its pathophysiological changes

HYPERTENSION

Volume loading mechanism, Vasoconstrictor mechanism, Secondary hypertension, primary hypertension (Essential), Heart failure

CARDIAC HYPOTROPHY

Centric, eccentric, pathophysiology of heart failure, Ischemic heart disease, Exercise physiology

8. ENDOCRINE AND REPRODUCTIVE PHYSIOLOGY (22 hours)

Introduction. The pituitary, hypothalamic hormone, adenohipophysis, neurohipophysis, clinical correlates. The thyroid, the metabolic rate iodine metabolism, clinical correlates. The parathyroid, Calcium metabolism and bone physiology, clinical correlates. The adrenal glands, the cortex, the medulla. The gonads. The tests, the ovary. Reproduction Pregnancy and lactation. Other organs with endocrine functions, pancreas

9. DIGESTION (12 hours)

Introduction to the gastrointestinal tract. GIT Hormones, Salivary secretion, gastric secretion, pancreatic secretion, Secretion of bile, secretion of the small intestine, Secretion of large intestine, Basic principles of gastrointestinal absorption, Absorption in the small intestine, Regulation of gastrointestinal function, Gastrointestinal motility

10. RENAL PHYSIOLOGY (8 hours)

Functional anatomy of the kidney, Auto regulation of renal blood flow, Mechanism of glomerular filtration rate, Reabsorption and secretion in the tubule, Water and sodium homeostasis, Effects of water loss, Regulation of tubular reabsorption of sodium. Regulation of potassium balance, Diuretics

11. ACID – BASE BALANCES (6 hours)

The hydrogen ion and PH, Fundamental chemistry of acids and bases, Concept of PH and H^+ , H^+ of body fluids, the Henderson- Hasselbaalch equation, Generation and elimination of H^+ . Carbonic and acids, Body buffer systems distributor of body buffer systems, Respiratory regulation of acid – base balance, Renal regulation of acid – base balance, Acid-base abnormalities.

12. HIGH ALTITUDE PHYSIOLOGY + SEA DIVING PHYSIOLOGY (6 hours)

Effects of acceleratory forces on the body, Centrifugal acceleratory forces, Effects of linear acceleratory forces on the body, Problems of temperature in

aviation and space physiology, Radiation at the high altitudes and space weightlessness in space

Objectives:

To support students with:

- **Competent Knowledge Skills:**
To acquire a core scientific knowledge about humans as a physiological entity.
- **Clinical Skills:**
To apply basic physiology principles in the appropriate clinical context.
To acquire a list of clinical skills at the introductory level.
- **Non-technical Skills and Professional Behavior:**
To incorporate physiology into the personal path of becoming a competent and caring physician
To be aware of physiological research to improve diagnoses and treatments of diseases

Outcome of curriculum:

On completion of this course, the students should;

- 1-understand normal body function from molecular to cellular, cellular to tissue, tissue to organ, and organ to organ systems level.**
- 2-understand interrelationships between organ systems.**
- 3-have acquired sufficient knowledge of the above to begin to understand human disease processes and appropriate therapeutic interventions.**

Course Requirements:

Comfortable Teaching class Room supplied with teaching aids like data show & white board with its accessories.

Places for teaching the curriculum:

- 1. Class room in the college. (Wide air-conditioned, with enough windows with curtains an enough illumination and supplied with teaching aids.**
- 2. physiology Laboratory for undergraduate studies. (Wide with enough working benches, well aired, with enough windows with curtains and enough illumination and supplied with teaching aids).**

Materials used to accomplish the practical curriculum:

- 1. Microscopes (compound light microscopes).**
- 2. Sterilizing and disinfection tools and materials.**
- 3. Hematological lab devices, incubator, oven, autoclave, refrigerator, water bath, Millipore filters and tube racks and hand disinfectant container.**

4. Slides with Permanent stained hematological specimens.
5. Staining kits like Gram Stain Kit, Acid Fast Staining Kit, Albert stain kit and other required stains.
6. Charts , Atlases of Medical physiology
7. Teaching Videos.
8. Experimental animals (frog) for muscle twitch study
9. Teaching devices like stethoscopes, sphygmomanometers, oroscope, hammers and ophthalmoscope.
10. Electrocardiography(ECG)
11. Treadmill for exercise study and its effect on vital signs
12. Spirometry for measurement of pulmonary function test.
13. Myograhly for measurement of simple muscle twitch

Theoretical Class Schedule

Teaching staff	Topics covered	Week
Ass. Lecturer Dr. Ahmad Talib	<i>introduction to physiology</i> <i>fundamentals of general physiology,</i> <i>cellular organization</i> <i>- homeostasis</i>	Week 1
Ass. Lecturer Dr. Ahmad Talib	<i>- Body fluids, volume and distribution</i> <i>- dynamics,</i> <i>- Edema Body water</i> <i>functions</i> <i>- Body fluid</i>	
Ass. Lecturer Dr. Ahmad Talib	<i>physiology of the muscle</i> <i>Introduction types of muscles</i> <i>Skeletal muscles, structure,</i> <i>motor units, Excitability.</i> <i>Mechanical response of the muscle</i>	Week 2
Ass. Lecturer Dr. Ahmad Talib	<i>Simple muscle twitch</i> <i>Type of contraction, muscle fatigue.</i> <i>Summation of muscle contraction.</i> <i>Effect of two muscle stimuli</i>	
Ass. Lecturer Dr. Ahmad Talib	<i>Clonus and tetanus.</i> <i>All or none law, muscle tone.</i>	Week 3

<p>Lecturer Dr. Ansaf Ibrahim</p>	<p><i>The sliding filaments</i> <i>Thermal and chemical changes during muscle contraction.</i></p> <p>BLOOD PHYSIOLOGY <i>Composition and function</i> <i>The red blood cell</i> <i>Hemoglobin and hemoglobin variants</i> <i>Iron metabolism, anemias.</i></p>	
<p>Lecturer Dr. Ansaf Ibrahim</p> <p>Ass. Lecturer Dr. Latief Fayyadh</p>	<p><i>The immune system, allergy</i> <i>The platelets</i> <i>Homeostasis and blood coagulation</i></p> <p><i>acid – base balances</i> <i>The hydrogen ion and PH.</i> <i>Fundamental chemistry of acids and bases,</i> <i>Respiratory regulation of acid base balance.</i> <i>Renal regulation of acid base balance. Acid-base abnormalities.</i></p>	<p>Week 4</p>
<p>Assist. Prof. Dr. Waleed Nassar</p> <p>Assist. Prof. Dr. Waleed Nassar</p>	<p><i>Renal Physiology</i> <i>Functional anatomy of the kidney</i> <i>Auto regulation of renal blood flow</i> <i>Mechanism of glomerular filtration rate</i></p> <p><i>Reabsorption and secretion in the tubule</i> <i>-Water and sodium homeostasis</i> <i>Effects of water loss</i></p>	<p>Week 5</p>
<p>Assist. Prof. Dr. Waleed Nassar</p> <p>Ass. Lecturer Dr.</p>	<p><i>Regulation of tubular reabsorption of sodium</i> <i>Regulation of potassium balance</i> <i>Diuretics</i></p> <p>DIGESTION <i>Introduction to the GIT</i> <i>GIT Hormones, Salivary secretion,</i></p>	<p>Week 6</p>

Mohammed Ibrahim	<i>gastric secretion, pancreatic secretion</i>	
Ass. Lecturer Dr. Mohammed Ibrahim	<i>Secretion of bile, secretion of the small intestine Secretion of large intestine Basic principles of gastrointestinal absorption</i>	Week 7
Ass. Lecturer Dr. Mohammed Ibrahim	<i>Absorption in the small intestine Regulation of gastrointestinal function Gastrointestinal motility</i>	
Ass. Prof. Dr. Maher A. Jasim	<i>Respiratory Physiology Functional anatomy Lung volumes and capacities</i>	Week 8
Ass. Prof. Dr. Maher A. Jasim	<i>Mechanics of breathing muscles of respiration Pressure changes during the respiratory Expansion of the lungs, Compliance</i>	
Ass. Prof. Dr. Maher A. Jasim	<i>Airway resistance Pulmonary circulation Pressure Low and resistance of pulmonary blood vessels Alveolar ventilation</i>	Week 9
Ass. Prof. Dr. Maher A. Jasim	<i>Distribution of ventilation and Perfusion, Exchange of gases and diffusion capacity Transport of oxygen by the blood Transport of carbon dioxide by the blood</i>	

<p>Ass. Prof. Dr. Maher A. Jasim</p> <p><i>Control of ventilation Hypoxia, hypercapnia and hypocapnia, Oxygen therapy Effect of exercise , Artificial respirator</i></p> <p>Ass. Prof. Dr. Maher A. Jasim</p> <p><i>Non respiratory function of the lungs, Pulmonary function tests, total and regional Patterns of breathing, normal and abnormal</i></p>		Week 10
<p>Lecturer Dr. Khalid Messer</p> <p><i>The Cardiovascular System Introduction to cardiovascular physiology, Anatomical review, autonomic supply, Blood supply Specialized tissue</i></p> <p>Lecturer Dr. Khalid Messer</p> <p><i>Heart as pump (contractility) The electrical activity of heart Action potential, fast response and slow response The refractory periods</i></p>		Week 11
<p>Lecturer Dr. Khalid Messer</p> <p><i>THE ELECTROCARDIOGRAPHY general background, electrical axis PQRST waves and their clinical significance, the leads cardiac arrhythmias, cellular basis of cardiac arrhythmias</i></p> <p>Lecturer Dr. Khalid Messer</p> <p><i>The cardiac function curve The vascular function curve Methods of measuring cardiac Output, Factors regulations cardiac output</i></p>		Week 12
<p>Lecturer Dr. Khalid Messer</p> <p><i>General venous pressure and its regulation, Venous pump, reference point, the filling pressure. Hypotension and shock</i></p> <p><i>Volume Loading mechanism Vasoconstrictor mechanism</i></p>		Week 13

Lecturer Dr. Khalid Messer	<i>Secondary hypertension, primary hypertension (Essential) Heart failure</i>	
Lecturer Dr. Khalid Messer	<i>Regulations of blood pressure short and long term control The pulse pressure, systolic blood pressure, diastolic blood Pressure, Koratkov sounds</i>	Week 14
Lecturer Dr. Khalid Messer	<i>pathophysiology of heart failure Ischemic heart disease Exercise physiology</i>	
Ass. Lecturer Dr. Latief Fayyadh	<i>Endocrine and Reproductive Physiology Introduction</i>	Week 15
Ass. Lecturer Dr. Latief Fayyadh	<i>The pituitary, hypothalamic hormone, adenoypophesis, neurohypophesis, clinical correlates</i>	
The second term		
Ass. Lecturer Dr. Latief Fayyadh	<i>The thyroid, the metabolic rate iodine metabolism, clinical correlates</i>	Week 16
Ass. Lecturer Dr. Latief Fayyadh	<i>The parathyroid, Calcium metabolism and bone physiology, clinical correlates</i>	
Ass. Lecturer Dr. Latief Fayyadh	<i>The adrenal glands, the cortex, the medulla</i>	Week 17

Ass. Lecturer Dr. Latief Fayyadh	<i>The gonads. The tests, the ovary</i>	
Ass. Lecturer Dr. Latief Fayyadh Ass. Lecturer Dr. Latief Fayyadh	<i>Reproduction Pregnancy and lactation</i> <i>Other organs with endocrine functions, pancreas</i>	Week 18
Lecturer Dr. Wesam Alfehan Lecturer Dr. Wesam Alfehan	<i>Physiology Of The Nervous System physiology of the nerve fibers. properties of nerve fibers transmission along nerve fibers.</i> <i>Types of nerve fibers and compound action potential Ionic theory of the membrane Potential Structure and type of nerve trunk, effect of cutting a motor nerve.</i>	Week 19
Lecturer Dr. Wesam Alfehan Lecturer Dr. Wesam Alfehan	<i>Synaptic transmission EPSP and IPSP, ionic bases Convergence and divergence, spatial and temporal Neuromuscular transmission and blocking substances.</i> <i>Autonomic Nervous System Introduction and definition, the autonomic reflex action and its comparison to the somatic</i>	Week 20
Lecturer Dr. Wesam Alfehan	<i>Functional anatomy: sympathetic and parasympathetic system. The concept of membrane receptor Chemical transmission in the autonomic nervous system</i> <i>Function of the sympathetic and parasympathetic nervous system.</i>	Week 21

Lecturer Dr. Wesam Alfehan	<i>Higher control of autonomic function: spinal, medullary, hypothalamic, limbic and cortical</i>	
Lecturer Dr. Wesam Alfehan	<i>Body temperature regulation Normal temperature and set-point Heat production, shivering and non-shivering thermogenesis.</i>	Week 22
Lecturer Dr. Wesam Alfehan	<i>Heat loss, hypothalamic regulation Of body temperature Fever and hypothermia.</i>	
Lecturer Dr. Wesam Alfehan	<i>Sensation Introduction and definition, stimulus and the adequate stimulus, sensory receptors Classification of sensory receptors, electrical and ionic events in receptor potential</i>	Week 23
Lecturer Dr. Wesam Alfehan	<i>The sensory unit, the receptive field and cortical representation Coding of sensory information, the sensory pathways</i>	
Lecturer Dr. Wesam Alfehan	<i>Role of proprioceptors in reflex and voluntary muscular contraction. The stretch (tendon) reflex</i>	Week 24
Lecturer Dr. Wesam Alfehan	<i>The Golgi tendon organ and the inverse stretch, Gamma efferent activity and muscle tone effect (lengthening reaction)</i>	
Lecturer Dr. Wesam Alfehan	<i>Cold and warmth sensation, pain sensation Referred pain</i>	Week 25

Ass. Prof. Dr. Raid Al-Ani	<i>SPECIAL SENSES Hearing and equilibrium Functional anatomy of the ear</i>	
Ass. Prof. Dr. Raid Al-Ani Ass. Prof. Dr. Thakir Mohammed	<i>Properties of the hearing system Theories of hearing Vestibular function Functional anatomy of the eye Errors of refraction: myopia, hyperopia and astigmatism Physiology of the retina, visual fields and visual pathway</i>	Week 26
Ass. Prof. Dr. Thakir Mohammed Ass. Prof. Dr. Raid Al-Ani	<i>Visual accommodation and visual reflexes, visual acuity Color vision, cerebral cortical visual function Smell receptors and pathways Physiology of olfaction</i>	Week 27
Ass. Prof. Dr. Raid Al-Ani Lecturer Dr. Wesam Alfehan	<i>Taste receptor organs and Pathways, Physiology of taste Physiology of the spinal cord Reflexes, The cerebellum and its role in motor control and movement</i>	Week 28
Lecturer Dr. Wesam Alfehan	<i>Physiology of the hypothalamus and limbic system</i>	Week 29

Lecturer Dr. Wesam Alfehan	<i>The brain stem and reticular formation</i> <i>Wakefulness and sleep</i>	
Lecturer Dr. Wesam Alfehan	<i>Cerebral control function, motor functions and sensory function</i> <i>Conditioned reflexes</i>	Week 30
Lecturer Dr. Wesam Alfehan	<i>E.E.G</i> <i>Speech</i> <i>Memory</i>	

Practical Class Schedule

The teaching staff	Topics covered	Date
Lecturer Dr. Ansaf Ibrahim	Introduction in haematology	Week 1
Ass. Lecturer Dr. Mohammed Ibrahim	Introduction in haematology	
Lecturer Dr. Ansaf Ibrahim	Anticoagulant	Week 2
Ass. Lecturer Dr. Mohammed Ibrahim	Anticoagulant	
Lecturer Dr. Ansaf Ibrahim	Blood films	Week 3
Ass. Lecturer Dr.	Blood films	

Mohammed Ibrahim		
Lecturer Dr. Ansaf Ibrahim	Stains of blood	Week 4
Ass. Lecturer Dr. Mohammed Ibrahim	Stains of blood	
Lecturer Dr. Ansaf Ibrahim	Red Blood Cells (RBC _s) Count	Week 5
Ass. Lecturer Dr. Mohammed Ibrahim	Red Blood Cells (RBC _s) Count	
Lecturer Dr. Ansaf Ibrahim	Hb (Haemoglobin) estimation.	Week 6
Ass. Lecturer Dr. Mohammed Ibrahim	Hb (Haemoglobin) estimation.	
Lecturer Dr. Ansaf Ibrahim	PCV (Packed Cell Volume).	Week 7
Ass. Lecturer Dr. Mohammed Ibrahim	PCV (Packed Cell Volume).	
Lecturer Dr. Ansaf Ibrahim	ESR (Erythrocyte Sedimentation Rate).	Week 8
	ESR (Erythrocyte Sedimentation	

Ass. Lecturer Dr. Mohammed Ibrahim	Rate).	
Lecturer Dr. Ansaf Ibrahim Ass. Lecturer Dr. Mohammed Ibrahim	Total white blood cells count (TLC) Total white blood cells count (TLC)	Week 9
Lecturer Dr. Ansaf Ibrahim Ass. Lecturer Dr. Mohammed Ibrahim	Differential WBC _s count Differential WBC _s count	Week 10
Lecturer Dr. Ansaf Ibrahim Ass. Lecturer Dr. Mohammed Ibrahim	Diseases disorder of differential WBC _s count Diseases disorder of differential WBC _s count	Week 11
Lecturer Dr. Ansaf Ibrahim Ass. Lecturer Dr. Mohammed Ibrahim	Platelets (Thrombocytes)count - Platelets (Thrombocytes)count	Week 12
Lecturer Dr. Ansaf Ibrahim Ass. Lecturer Dr. Mohammed Ibrahim	Reticulocytes count Reticulocytes count	Week 13

Lecturer Dr. Ansaf Ibrahim	Reticulocytes count	Week 14
Ass. Lecturer Dr. Mohammed Ibrahim	Reticulocytes count	
Lecturer Dr. Ansaf Ibrahim	Revision	Week 15
Ass. Lecturer Dr. Mohammed Ibrahim	Revision	
Second Term		
Ass. Lecturer Dr. Latief Fayyadh	Vital signs(Part 1)	Week 16
Ass. Lecturer Dr. Ahmad Talib	Vital signs(Part 1)	
Ass. Lecturer Dr. Latief Fayyadh	Vital signs(Part 2)	Week 17
Ass. Lecturer Dr. Ahmad Talib	Vital signs(Part 2)	
Ass. Lecturer Dr. Latief Fayyadh	Vital signs(Part 3) in relation to exercise	Week 18
Ass. Lecturer Dr. Ahmad Talib	Vital signs(Part 3) in relation to exercise	

Ass. Lecturer Dr. Latief Fayyadh	Physical examination (general)	Week 19
Ass. Lecturer Dr. Ahmad Talib	Physical examination (general)	
Ass. Lecturer Dr. Latief Fayyadh	Precordial examination	Week 20
Ass. Lecturer Dr. Ahmad Talib	Precordial examination	
Ass. Lecturer Dr. Latief Fayyadh	Respiratory examination	Week 21
Ass. Lecturer Dr. Ahmad Talib	Respiratory examination	
Ass. Lecturer Dr. Latief Fayyadh	Abdominal examination	Week 22
Ass. Lecturer Dr. Ahmad Talib	Abdominal examination	
Ass. Lecturer Dr. Latief Fayyadh	Sensory system examination	Week 23
Ass. Lecturer Dr. Ahmad Talib	Sensory system examination	
Ass. Lecturer Dr. Latief Fayyadh	Motor system Examination	Week 24
	Motor system	

Ass. Lecturer Dr. Ahmad Talib	Examination	
Ass. Lecturer Dr. Latief Fayyadh	Cranial nerves Examination(1)	Week 25
Ass. Lecturer Dr. Ahmad Talib	Cranial nerves Examination(1)	
Ass. Lecturer Dr. Latief Fayyadh	Cranial nerves Examination(2)	Week 26
Ass. Lecturer Dr. Ahmad Talib	Cranial nerves Examination(2)	
Ass. Lecturer Dr. Latief Fayyadh	Electrocardiogram (ECG)	Week 27
Ass. Lecturer Dr. Ahmad Talib	Electrocardiogram (ECG)	
Ass. Lecturer Dr. Latief Fayyadh	Electrocardiogram (ECG)	Week 28
Ass. Lecturer Dr. Ahmad Talib	Electrocardiogram (ECG)	

Ass. Lecturer Dr. Latief Fayyadh	Scientific videos	Week 29
Ass. Lecturer Dr. Ahmad Talib	Scientific videos	
Ass. Lecturer Dr. Latief Fayyadh	Revision	Week 30
Ass. Lecturer Dr. Ahmad Talib	Revision	

Methods of assessment

No	Exam	Type of assessment	Marks
1	First term	Quiz in the same theoretical lectures	3
		End term written exam (60% MCQs & 40% essay questions)	7
		Practical exam.(Data show slides, spot diagnosis exam.)	5
2	Second term	Quiz in the same theoretical lectures	3
		End term written exam (60% MCQs & 40% essay questions)	7
		Practical exam.(Data show slides, spot diagnosis exam.)	5
3	Final clinical	Oral exam	5
		Data show slides and spot diagnosis exam	15
4	Final written	MCQs	30
		Essay questions	20
5		Total	100

Recommended book: .Guyton and hall textbook of medical physiology

Department of Chemistry and Biochemistry

Subject: Biochemistry

Academic year: Second year

Coordinator: Instructor Dr. Muhammad H. Al-Ajeel

A Head of Chemistry and Biochemistry Department

Teaching staff:

4. Dr. Muhammad H. Al-Ajeel
5. Dr. Ausama Abbas Faisal
6. Lecturer: Methal R. Al-Kubaisee
7. Lecturer: Rana T. Alani

Introduction

Biochemistry department courses covers the field of biochemistry with a focus on human physiology and includes core themes from a wide range of science subjects including General chemistry, Biochemistry and Clinical Chemistry. Laboratory diagnostic methods will be developed throughout the courses. Students will learn practical skills in analytical and diagnostic techniques applicable in a wide range of fields including Biochemistry.

- In 2nd stage; The basic science underpinning the speciality in which the registrant practices, relevant basic clinical medicine and the fundamental principles of clinical practice.
- Finally, Clinical Chemistry will provide an advanced knowledge of the metabolism and function of Vitamins, Carbohydrates, Lipids, Proteins, Nucleic acids and hormones.
- In addition to the laboratory investigation of metabolism disorders.

D. Objectives

- The structure and function of the human body, as relevant to practice, together with a knowledge of health, disease, disorder and dysfunction, and pathology;
- The role of other professions in health and social care.
- The theoretical basis, and the variety of approaches to, assessment and intervention.

E. A detailed knowledge of:

- The basic science underpinning the speciality in which the registrant practices, relevant basic clinical Biochemistry in field of medicine and the fundamental principles of clinical practice.
- Demonstrate an advanced knowledge of the metabolism and functions of Carbohydrates, Lipids, Proteins, Nucleic acids & Hormones.
- Implement the use of biochemical tests and explain their clinical significance in the assessment of thyroid, pituitary, adrenal, hypothalamic, ovarian and testicular function.

- Demonstrate an advanced knowledge of the use of biochemical tests as tumour markers.
- Apply with advanced knowledge the use of biochemical tests and describe their clinical significance in the assessment of iron status.
- Demonstrate professional insight and knowledge into abnormalities associated with protein metabolism.

F. The ability to:

- To be able to relate biochemistry to the human body.
- To know the biomolecules' structure and their functions.
- To know the metabolism general structure and its components.
- To know the relation between clinical biochemistry and the human body's functioning.
- Identify the clinical decision which the test/intervention will inform.
- The student will know the functioning and dynamics of a clinical laboratory
- The students will know which parameters can affect the analytical results of a specimen since it is collected until it is processed.
- The students will integrate the knowledge gained on Biochemistry, Anatomy and Physiology, in order to understand the pathophysiology of disease processes and their correlation in the study of body functions.
- The students will assess the choice of analytical techniques according to the screening targets.
- The students will know which laboratory tests are common in order to help in the Haematology and Clinical Biochemistry laboratory assessment.
- The students will learn how to assess blood test results and their involvement in the assessment of different pathologies.
- The student will develop analysis, synthesis and reflective skills and will be able to related different topics,
- To learn how to manage different sources of information.

Biochemistry Components, duration and units of the curriculum

No	Components	Duration	Units
1	Theoretical lectures	90 hours	6
2	Practical Laboratory	60 hours	2
3	Total	150 hours	8

Places of completion the curriculum:

1. Studying hall in the college
2. Laboratory for practical part in the college.
3. Seminar rooms for small teaching groups

Material used for completion the curriculum:

1. Glassware and Chemicals.
2. Analytical instruments.
3. Teaching videos

Theoretical lectures: 90 lectures, 3 hours/week

No	Name of lecture	Objectives from the lecture by 1 hour
1.	Enzymes	<ul style="list-style-type: none"> - Classification of enzymes - Factors affecting enzymatic reactions - Enzymes specificity
2.		<ul style="list-style-type: none"> - Enzyme Structure - Model of enzyme action - 1-lock and key - 2-induced fit model
3.		<ul style="list-style-type: none"> - Mechanism of enzyme action - Inhibition of enzymes - 1-reversible inhibition - 2-irreversible inhibition - Uses of inhibition
4.		<ul style="list-style-type: none"> - Factors affecting catalytic of enzymes - Enzymes in clinical diagnosis - Enzymes and genetic diseases
5.	Clinical enzymology	<ul style="list-style-type: none"> - Plasma enzymes - Functional enzymes - Non Functional enzymes
6.		<ul style="list-style-type: none"> - Medical importance of non Functional enzymes - lactate dehydrogenase - creatine kinase - Aspartate amino transferase - Alanine amino transferase - Alkaline phosphate - Nucleotide phosphate - Gamma glutamyl transferase - Enzyme profile in liver diseases - Acid phosphatase - Amylase
7.	Antioxidants	<ul style="list-style-type: none"> - Free radicals - Formation of Free radicals
8.		<ul style="list-style-type: none"> - Free radicals in biological - Protection from free radicals
9.	Vitamin and coenzymes	<p>The fat soluble vitamins:</p> <p>Vitamin A</p> <ul style="list-style-type: none"> - Metabolism of vitamin A - Releasing to the circulation - Visual activity of vitamin A - vitamin A deficiency - Hypervitaminosis
10.		<p>Vitamin D (calciferol)</p> <ul style="list-style-type: none"> - Cholecalciferol (D3) - Ergosterol (D2) - Metabolism of Vitamin D
11.		<ul style="list-style-type: none"> - function of Vitamin D

No	Name of lecture	Objectives from the lecture by 1 hour
		<ul style="list-style-type: none"> - major function - on intestine - on bone - minor function - on the kidney - Rickets - OsteomalasiaHypervitaminosis
12.		Vitamin K <ul style="list-style-type: none"> - Sources - Functions of vitamin K - Vitamin K deficiency - Deficiency of vitamin K in newborn
13.		Vitamin E (tocopherol) <ul style="list-style-type: none"> - Sources - Structures - Metabolism - Function of vitamin E - Vitamin E deficiency - Hypervitaminosis
14.		The water soluble vitamins <ul style="list-style-type: none"> - Ascorbic acid biochemical function - Thiamin and enzymatic reactions
15.		<ul style="list-style-type: none"> - Riboflavin biochemical function - Niacin, function and importance - Pyridoxine ,importance of transamination - Pantothenic acid and coenzyme - Biotin and its role
16.		<ul style="list-style-type: none"> - Folic acid , function, metabolism and antagonism - Vitamin B12 ,mechanism of action arid anemia
17.	Metabolism of minerals and trace elements	Calcium <ul style="list-style-type: none"> - Function of calcium: - The factors that counterbalance the degree of absorption of calcium: - Hormonal regulation of calcium - Controlling hormones - Influencing hormones
18.		<ul style="list-style-type: none"> - Disorder of calcium metabolism - Hypercalcaemia - Effects on the kidneys - Effects on CNS - Effects on stomach - Effects on blood pressure - Effects on heart
19.		<ul style="list-style-type: none"> - Causes of hypercalcaemia - Hypocalcaemia - Symptoms of hypocalcaemia

No	Name of lecture	Objectives from the lecture by 1 hour
		<ul style="list-style-type: none"> - Causes - Causes of neonatal hypocalcaemia
20.		Phosphate <ul style="list-style-type: none"> - Hormonal regulation: - Function of phosphate - Intracellular function - Extracellular function
21.		<ul style="list-style-type: none"> - Hypophosphataemia - Causes - Clinical manifestations - Hyperphosphataemia - Causes - Clinical manifestations
22.		Iron <ul style="list-style-type: none"> - Iron metabolism - Distribution of iron in the body - Complex physiological factors - b. Local factors in the GIT - Iron transport in plasma
23.		<ul style="list-style-type: none"> - Factors affecting on the plasma iron concentration - Physiological factors - Plasma total iron-binding capacity (TIBC) - B- Pathological factors - iron deficiency anemia
24.		Zinc <ul style="list-style-type: none"> - Zinc metabolism - Zinc deficiency Copper <ul style="list-style-type: none"> - Copper metabolism - copper deficiency Magnesium <ul style="list-style-type: none"> - Metabolism of magnesium - Magnesium deficiency Selenium <ul style="list-style-type: none"> - Metabolism of selenium - Selenium deficiency
25.	Bioenergy	<ul style="list-style-type: none"> - Free energy - ATP as an energy carrier
26.		<ul style="list-style-type: none"> - Electron transport chain - Oxidative Phosphorylation
27.	Carbohydrates	<ul style="list-style-type: none"> - Introduction to Metabolism Glycolysis <ul style="list-style-type: none"> - The reactions of glycolysis
28.		The Citric Acid Cycle (CAC) <ul style="list-style-type: none"> - The reactions of CAC

No	Name of lecture	Objectives from the lecture by 1 hour
29.		- ATP Formation in the Catabolism of Glucose
30.		- Regulation of Glycolysis & CAC pathway
31.		- Fructose & Galactose catabolism
32.		- Reoxidation of Cytoplasmic NADH.
33.		- Under aerobic conditions: Malate shuttle & Glycerol phosphate shuttle. - Under anaerobic conditions: The lactic acid cycle (Cori cycle)
34.		Glycogen - Metabolism of Glycogen - Glycogen Synthesis & Breakdown
35.		- Regulation of Glycogen metabolism - Disorders of Glycogen Metabolism
36.		- Metabolism of Monosaccharides and Disaccharides - Disorders of metabolism of Mono & Disaccharides
37.		Gluconeogenesis - Regulation of Gluconeogenesis & Glycolysis in the liver
38.		- The Pentose Phosphate Pathway
39.		Hormones concerned with glucose homeostasis: - Insulin - Glucagon.
40.		Disorders of Carbohydrate Metabolism - Hyperglycemia & Diabetes mellitus (DM): Type 1 & Type 2 - Hypoglycemia. - Diabetic ketoacidosis
41.	Lipids	- Introduction Fatty acids - DE NOVO synthesis of fatty acids - Relationship between GLUCOSE METABOLISM and PALMITATE SYNTHESIS
42.		- Oxidation of Fatty Acids: (Ketogenesis) - Fuel Catabolism: Net ATP in glycolysis & β -Oxidation
43.		Ketone Bodies - Pathway of ketogenesis in the liver - Formation, utilization, and excretion of ketone bodies - Regulation of ketogenesis
44.		Triglycerid - Synthesis of Triglycerid - Hormonal regulation of Triglycerid degradation.
45.		Cholesterol - Synthesis of Cholesterol - Regulation of cholesterol synthesis
46.		Bile acid and bile salts - biosynthesis of bile acids

No	Name of lecture	Objectives from the lecture by 1 hour
		<ul style="list-style-type: none"> - Synthesis of bile salts - Degradation of cholesterol
47.		Lipoproteins <ul style="list-style-type: none"> - Classification of Lipoproteins
48.		<ul style="list-style-type: none"> - Lipoprotein Metabolism: - The exogenous pathway transports - The endogenous pathway - The reverse cholesterol pathway
49.		Apolipoproteins <ul style="list-style-type: none"> - Classification of Lipoproteins
50.		Disorders of Lipid Metabolism <ul style="list-style-type: none"> - Primary: inherited (Familial). - Secondary: Clinically obvious disease & Covert conditions.
51.	Amino Acids	<ul style="list-style-type: none"> - Introduction - Nutritionally nonessential AAs: The short biosynthetic pathways - The glutamate dehydrogenase reaction - The glutamine synthetase reaction
52.		<ul style="list-style-type: none"> - Formation of alanine by transamination of pyruvate - The asparagine synthetase reaction - Serine biosynthesis
53.		<ul style="list-style-type: none"> - Glycine biosynthesis: from Serine , or choline. - Biosynthesis of proline from glutamate - Biosynthesis of Tyrosine from phenylalanine
54.		Amphibolic intermediates formed from the carbon skeletons of AAs <ul style="list-style-type: none"> - Catabolism of Gln , His , Arg& Pro to α-Ketoglutarate - Catabolism of Val to Succinyl-CoA - Catabolism of L-Asparagine to Oxaloacetate
55.		<ul style="list-style-type: none"> - Catabolism of Cystine& 4-OH-Pro to Pyruvate - Catabolism of Ile , Leu&Thr to Acetyl-CoA - Catabolism of Met to Propionyl-CoA
56.		<ul style="list-style-type: none"> - Proteins - Digestion of dietary proteins - Catabolism of Amino Acids
57.		<ul style="list-style-type: none"> - Biosynthesis of Urea - Urea Cycle
58.		Metabolic defects in amino acid metabolism <ul style="list-style-type: none"> - Phenylketonuria (PKU) - Maple syrup urine disease (MSUD) - Albinism - Homocystinuria - Hyperammonemia
59.	Nucleic Acids	<ul style="list-style-type: none"> - Constitution and general properties of nucleic acid
60.		<ul style="list-style-type: none"> - Metabolism of purine

No	Name of lecture	Objectives from the lecture by 1 hour
61.		- Metabolism of pyrimidine
62.		- Catabolism of purine & pyrimidine
63.		- Hyperuricemia and gout disease
64.		- Biochemical mutations - Porphyrin metabolism - Porphyrin disorder
65.		Protein Synthesis - The genetic code - Components required for translation Codon recognition
66.		Steps in protein synthesis - Initiation - Elongation - Termination - Polysomes - Protein targeting Regulation of translation
67.	Hormones	- Introduction - Classification of Hormones
68.		- Mechanisms of Hormone Action
69.		Hormones secreted by the Human - Endocrine Glands: Hypothalamus Pituitary; Posterior & Anterior
70.		- Thyroid Gland - Parathyroid Gland - Pancreas Gland - Adrenal Glands: Medulla & Cortex
71.		- Regulating Plasma Hormone Levels - Clearance of Hormone from the Body
72.		- Male & Female reproductive
73.		- Thyroid hormones & disorders.
74.		- Hormones Assay
75.	Digestion and absorption	- Digestion of carbohydrates
76.		- Absorption of carbohydrates
77.		- Digestion of protein
78.		- Absorption of protein
79.		- Digestion of fats and absorption
80.		- Mechanism of detoxification
81.	Special Topics	Globular Proteins - Structure and function of hemoglobin
82.		Liver function - Liver test Disorder
83.		Kidney function

No	Name of lecture	Objectives from the lecture by 1 hour
		<ul style="list-style-type: none"> - kidney test - Disorder
84.		Intermediary Metabolism Cancer <ul style="list-style-type: none"> - Glycolysis and respiration in cancer cells - Convergence and deletions - Correlation of biochemical parameters with tumor growth - Polyamine
85.		Tumor markers <ul style="list-style-type: none"> - Introduction - Alpha-fetoprotein (AFP) - Beta-2-microglobulin (B2M) - Beta-human chorionic gonadotropin (Beta-hCG) - CA15-3/CA27.29: Breast cancer - CA19-9: Pancreatic cancer, gallbladder cancer, bile duct cancer, and gastric cancer - CA-125: Ovarian cancer - Calcitonin: Medullary thyroid - carcerryonic antigen (CEA): Colorectal cancer - PSA: prostatic cancer - And others
86.		Biochemistry of Extracellular & Intracellular Communication <ul style="list-style-type: none"> - Membranes: Structure & Function - Intracellular fluid (ICF) & Extracellular fluid (ECF) - The Ionic Compositions of Intracellular & Extracellular Fluids Differ Greatly - Cellular membranes compositions.
87.		Multiple Myeloma <ul style="list-style-type: none"> - Diagnosis by Electrophoresis. - Components of Serum Protein Electrophoresis
88.		The chemistry of elderly
89.		Pediatric biochemistry
90.		Alcohol poisoning

Practical Laboratory: 60 hours, 2hours/week

- 1- The use of laboratory.
- 2- Enzyme nature catalysis.
- 3- Enzyme specificity and factors affecting on enzyme activity.
- 4- Photometry.
- 5- Saliva.
- 6- Blood sugar estimation.
- 7- Diagnosis of diabetes mellitus.
- 8- Vitamins. (2 weeks)
- 9- Colorimetry.

- 10- Determination of serum potassium.
- 11- Determination of serum calcium.
- 12- Determination of serum phosphate.
- 13- Determination of serum Magnesium.
- 14- Determination of serum cholesterol.
- 15- Determination of serum Triglyceride..
- 16- Determination of serum HDL.
- 17- Determination of total protein.
- 18- Determination of serum uric acid.
- 19- Determination of serum urea.
- 20- Determination of serum GOT.
- 21- Determination of serum GPT.
- 22- Determination of serum CPK.
- 23- Determination of serum LDH.
- 24- Determination of serum alkaline phosphatase.
- 25- Determination of serum Bilirubin.
- 26- Determination of serum Creatinine.
- 27- Estimation of TSH level by ELIZA.
- 28- Estimation of T3 level by ELIZA.
- 29- Estimation of T4 level by ELIZA.

Methods of assessment

No	Exam	Type of assessment		Marks
1	1 st term	Theoretical part	Quiz in the same theoretical lectures	1
			Seminar	1
			End term written exam (60% MCQs & 40% essay questions)	8
		Practical part	Practical exam	1
			Reports	1
			Quiz	1
			Theoretical written exam	2
2	2 nd term	Theoretical part	Quiz in the same theoretical lectures	1
			Seminar	1
			End term written exam (60% MCQs & 40% essay questions)	8
		Practical part	Practical exam	1
			Reports	1
			Quiz	1
			Theoretical written exam	2
3	Final	Theoretical part	End term written exam (60% MCQs & 40% essay questions)	55
4		Practical part	End term written exam (60% MCQs & 40% essay questions) for experimental laboratory.	15
5	Total			100

Recommended References

1. Harper's Illustrated Biochemistry; by Robert K. Murray, Daryl K. Granner, Peter A. Mayes & Victor W. Rodwell, Lange Medical Books/McGraw-Hill, twenty-sixth edition; 2003. New York
2. Lippincott's. Illustrated Reviews: Biochemistry; by.. Denise R. Ferrier & Bradford Jameson, Wolters Kluwer; Sixth Edition; 2014 Philadelphia.
3. Theoretical lectures by Dr. Muhammad H. Al-Ajeel and Dr. Ausama Abbas Faisal.
4. Practical notes for students to learn biochemistry experimental by biochemistry department.
5. 400 MCQs in Biochemistry Answers by Dr. Muhammad H. Al-Ajeel.

Department of Human Anatomy

Subject: Histology

Academic year: Second year

Course coordinator: Prof. Dr. Mahdi Salah Shalal

Professor and Histology and Embryology, Department of Human Anatomy

Teaching staff:

- One Professor.
- Two lecturers.
- One assistant lecturers.

Allocated marks: 100 marks.

Course duration: One academic year.

Introduction:

Human Histology is a laboratory-based study that investigates the microscopic structure of the different human body systems. An understanding of human body tissues provide a fundamental and accurate early pathological diagnosis which help of proper treatment of patients with medical problem. The purpose of this curriculum is to provide a basic detailed plan for teaching human Histology in our college. In updating our Histology curriculum, Unnecessary details and sophisticated clinical data were avoided from the Curriculum

The Anatomy Department in the College of Medicine, University of Anbar hosts the medical students on training course for 135 hours/yr. Our aim is to enhance the knowledge of our students and let them be aware about the first steps in studying the tissue of the human body to asses them in their clinical life.

Overall Aims:

The course is designed to introduce the student to:

1. Medical terminology and methods used in gathering information.
2. Understanding of the structure and organization of the human body
3. The correlation between structure and function.
4. An awareness of how Histological knowledge may be applied effectively in and scientific context.
5. Understand how to differentiate between normal and pathological tissue.
6. The beginnings of an understanding of how to pursue independent and self-learning and how to work effectively in small groups.

General Objectives:

At the end of the course students should be able to:

1. Describe the structural of human body cells and the components of the different organs.
2. Describe the different type of tissues like epithelial tissue, connective tissue, muscular tissue and the nervous tissue of different organs of human body
3. The correlation between the structure and the function of the body organs.
4. Learning of the blood tissue and bone marrow component and the ways of the formation of the cells of different body tissue.

5. The ability to know the immunity cells and the different immunity organs and the other mean of body defense methods.
6. The ability of clinical and disease application of the major histological information.

Components, duration and units of the curriculum

No	Components	Duration	Unit
1	Theoretical lectures	45 hours	3
2	Practical Sessions	90 hours	3
3	Total	135 hours	6

Places of completion the curriculum:

1. **Lecture hall in the college**
2. **Anatomical lab in the college**

Material used for completion the curriculum:

1. Audiovisual aids.
2. Interaction with the students through questions.
3. Power point presentation.
4. Microscopes
5. Teaching microscope
6. Glass slides of human body tissue.
7. Computer.
8. Data show.
9. Histological charts.
10. Diagrams and posters.

Syllabus:

Teaching Techniques:

Teaching will be conducted using the following techniques:

1. Theoretical Sessions:

- lectures were designed to cover most of topics of the histological of human body.
- The time of the lecture is 60 minutes.
- There are 2 theoretical lecture/week for the first term and 1 lecture/week for the second term.

2. Practical Sessions:

- The practical sessions follow the theory lectures in the same week.
- The students are divided into 2 groups (A, B).
- Each group is subdivided into 6 subgroups.
- The time of each session is 3 hours.
- There are one session/ week.

Week	Subject
1	The blood tissue: Blood leukocyte: differential diagnosis, normal percentage, erythrocytes : shape, structure and function, blood platelets: structure and function.
2	Myeloid tissue: General structure, erythropoiesis, granulopoiesis, structure and development of blood platelets.
3	Nervous tissue : Constituents of nervous tissue, neurons: structure and classification, organoids of neurons, axons and dendrites.
4	Nervous tissue: Supporting cells in CNS and PNS, synapses, nerve fibers, cerebrospinal and autonomic ganglia.
5	Cardiovascular system: Blood vessels: types of arteries, types of veins, venules, types of capillaries, sinusoids, and arteriovenous anastomosis.
6	Cardiovascular system: Wall of the heart, cardiac valves, and pulse conducting system.
7	Lymphatic system: Lymphatic vessels, lymphatic organs, tonsils, lymph nodes, and hemolymph nodes
8	Lymphatic system: Thymus, spleen: the different theories of arterio-venous circulation, and lymphatic nodules in other non lymphatic organs.
9	Respiratory system: Nasal cavity, vestibular region, respiratory, region olfactory region, larynx, and trachea.
10	Respiratory system: Lung: bronchi, bronchioles, alveolar ducts, alveoli, interalveolar septum, and pleura.
11	Digestive system: Oral cavity, lip, tongue, lingual papillae, and esophagus.
12	Digestive system: Stomach: cardiac portion, fundic portion, pyloric portion, and small intestine.
13	Digestive system: Duodenum, jejunum, ileum, large intestine: colon, and recto anal junction.
14	Digestive system: Accessory glands: liver, and pancreas.
15	Revision and examination
16	Urinary system: Unipyramidal kidney, multipyramidal kidney: general microscopic structure, nephron: portions and function.
17	Urinary system: Guxtaglomerular complex: portions and function, ureter, urinary bladder, and urethra.
18	Endocrine system: Pituitary gland: embryonic origin, adenohipophysis and endocrine cell types, neurohypophysis, hypothalamic portion.
19	Endocrine system: Thyroid gland: structure and function, adrenal gland: structure and function, parathyroid gland: structure and function, endocrine cells in other organs
20	Male reproductive system: Histological structure of testis, seminiferous tubules, spermatozoa development, adult spermatozoa, interstitial cells.
21	Male reproductive system: Epididymis, ductus deferens, prostate gland, vesicular gland, bulbourethral gland.
22	Male reproductive system: Penis and spermatic cord.
23	Female reproductive system: Histological structure of ovary, and ovarian follicle

	development.
24	Female reproductive system: Ovulation, corpus luteum and function oviduct portions.
2 ^o	Female reproductive system: Histological structure of uterus, cyclic changes in the endometrium, cervix, vagina, mammary gland and functional conditions.
26	Sensory organs: Eye: histological structure: cornea, sclera, choroid, ciliary body, iris, retina, eyelid.
27	Sensory organs: Ear: histological structure of internal ear: osseous labyrinth, membranous labyrinth, cochlear duct, organ of corti.
28	Skin: Epidermis, dermis, hair follicles: structure, classification, and arrangement.
29	Skin: Skin glands: sebaceous gland, sweat glands, arrector pili muscle, Nail.
30	Revision and examination

Methods of assessment

No	Exam	Type of assessment		Marks
1	First term	Theoretical part	Quizzes in the same theoretical lectures	2
			End term written exam (60% MCQs &/or EMQ & 40% essay questions)	8
		Practical part	Practical exam	5
2	Second term	Theoretical part	Quizzes in the same theoretical lectures	2
			End term written exam (60% MCQs &/or EMQ & 40% essay questions)	8
		Practical part	Practical exam	5
3	Final	Theoretical part	End term written exam (60% MCQs &/or EMQ & 40% essay questions)	50
4		Practical part	Practical exam	20
5	Total			100

Suggested Reading List:

1. Junqueira's Basic Histology By Mescher
2. Atlas of Histology By Eroschenko

Department of Human Anatomy

Subject: Anatomy

Academic year: Second year

Course coordinator: Assist. Prof. Dr. Adnan Hammad Mahdi

Assistant Professor and Head of Anatomy and Histology Department

Teaching staff:

1. Three assistant professors.
2. Five lecturers.
3. Five assistant lecturers.

Allocated marks: 100 marks.

Course duration: One academic year.

Introduction:

Human Anatomy is a laboratory-based study that investigates the structure of the human body. Topics covered will include the basic organization of the body and major body systems along with the impact of diseases on certain systems. We are constructed to introduce the basics of anatomy and the principles of dissection to the medical students. An understanding of human anatomy provides a fundamental framework for the accurate diagnosis and proper treatment of patients with medical problem, a significant population of any medical practice. The purpose of this curriculum is to provide a basic detailed plan for teaching human anatomy in our college, Unnecessary details and sophisticated clinical data were avoided from the Curriculum, regarding this as a first step in updating our anatomy curriculum in comparison with other worldwide. The curriculum also describe the subjects and topics in clinical anatomy given for medical student.

The Anatomy Department in the College of Medicine, University of Anbar hosts the medical students on training course for 210 hours/year. Our aim is to enhance the knowledge of our students and let them be aware about the first steps in studying human body to asses them in their clinical life.

To achieve this purpose, hard work and appropriate methods of learning were carried out by all anatomy academic staff.

Overall Aims:

The course is designed to introduce the student to:

1. Medical terminology and methods used in gathering information.
2. Understanding of the structure and organization of the human body.
3. The correlation between structure and function.
4. An awareness of how anatomical knowledge may be applied effectively in clinical and scientific context.
5. The beginnings of an understanding of how to pursue independent and self-learning and how to work effectively in small groups.

General Objectives:

At the end of the course students should be able to:

- Describe the structural components of the different regions of the human body.

- Describe the basic anatomical structure of the different organs and systems of the human body.
- Recognize the surface landmarks of the underlying bones, muscles and tendons, and internal structures (main nerves, vessels and viscera).
- Enumerate the different branches of nerves and vessels.
- Recall the actions of the different muscles.
- Distinguish the movements of different joints and the muscles responsible for each movement.
- Outline the major clinical applications of anatomical facts.
- Predict clinical signs of nerve injuries based on their normal anatomy.

Components, duration and units of the curriculum

No	Components	Duration	Unit
1	Theoretical lectures	60 hours	4
2	Clinical course	150 hours	5
3	Total	210 hours	9

Places of completion the curriculum:

- 1. Lecture hall in the college**
- 2. Anatomical lab in the college**

Material used for completion the curriculum:

- 1. Audiovisual aids through animations and diagrams.**
- 2. Interaction with the students through questions.**
- 3. Power point presentation.**
- 4. Cadavers**
- 5. Skeletons**
- 6. Individual bones**
- 7. Pre-dissected specimens**
- 8. Plastic specimens**
- 9. Radiological films (Plain X-ray , CT scan and MRI films)**
- 10. Diagrams and posters**
- 11. Video tapes and movies.**
- 12. Anatomage table.**

Syllabus:

Teaching Techniques:

Teaching will be conducted using the following techniques:

1. Theoretical Sessions:

- lectures were designed to cover most of topics in human anatomy. In addition to hints on surface anatomy, Radiology, clinical applications are given whenever appropriate.
- The time of the lecture is 50 minutes.
- There are 2 lecture/week and one discussion lecture/week.

2. Practical Sessions:

- The practical sessions follow the theory lectures in the same week.
- The students are divided into 2 groups (A, B).
- Each group is subdivided into 6 subgroups.
- The time of each session is 2.5 hours.
- There are 2 session / week.

A: The Head and neck: Theory 20 hr., Discussion 10 hr., Practical 60 hr.		
week	Topic	Objective
1	The Neck	<p>TO STUDY:</p> <ul style="list-style-type: none"> - Skin - Cutaneous Nerves <ul style="list-style-type: none"> - Greater occipital nerve - Lesser occipital nerve - Greater auricular nerve - Transverse cutaneous nerve - Supraclavicular nerve -Superficial Fascia <ul style="list-style-type: none"> -Platysma - Superficial Veins <ul style="list-style-type: none"> - External jugular vein and its tributaries - Anterior jugular vein - Superficial Lymph Nodes - Deep Cervical Fascia - Axillary Sheath - Carotid Sheath
2	The Triangles of the Neck	<p>TO STUDY:</p> <ul style="list-style-type: none"> - Sternocleidomastoid - Posterior triangle of the neck - Content of the posterior triangle of the neck - Arteries: Subclavian artery (third part), Superficial cervical artery, suprascapular artery, occipital artery. -Veins: External jugular vein and its tributaries, Subclavian Vein -Nerves: Brachial plexuses, Spinal part of accessory nerve, branches of the cervical plexus-Anterior Triangle of the Neck and its contents <ul style="list-style-type: none"> - Digastric muscle - Stylohyoid muscle

		<ul style="list-style-type: none"> - Digastric triangle - Carotid triangle and its contents - Muscular triangle and its contents <ul style="list-style-type: none"> - Infrahyoid muscles - Sternohyoid - Sternothyroid - Thyrohyoid
3	Main Arteries and Nerves of the Neck	<p>TO STUDY:</p> <ul style="list-style-type: none"> - Common Carotid Artery - External Carotid Artery, its relations and branches - Internal Carotid Artery and its relation - Main Veins of the Neck <ul style="list-style-type: none"> - Internal Jugular Vein, its relations and tributaries - Main Lymph nodes of the Neck <ul style="list-style-type: none"> - Deep cervical lymph nodes - Main Nerves of the Neck <ul style="list-style-type: none"> - Vagus nerve and its branches - Accessory nerve - Hypoglossal nerve - Cervical of the Sympathetic Trunk Part <ul style="list-style-type: none"> - Superior cervical ganglion and its branches - Middle cervical ganglion and its branches - Inferior cervical ganglion and its branches - Cervical Plexus <ul style="list-style-type: none"> - cutaneous branches - Muscular branches - Phrenic nerve
4	Viscera of the Neck	<p>TO STUDY:</p> <ul style="list-style-type: none"> - Thyroid gland, its lobes, relations, blood supply, and lymph drainage - Parathyroid glands and its blood supply - Trachea, its relations, blood supply, and nerve supply - Esophagus, its relations, blood supply, and nerve supply - The Root of the Neck <ul style="list-style-type: none"> - Scalenus anterior and its relations - Scalenus medius - Scalenus posterior - Subclavian artery <ul style="list-style-type: none"> - First part, its relations and branches - Second part, its relations and branches

		<ul style="list-style-type: none"> -Third part -Subclavian vein and its relations -Thoracic Duct -Lymph Drainage of the Head and Neck -Regional groups of lymph nodes -Deep cervical lymph nodes
5	The Head	<p>TO STUDY:</p> <ul style="list-style-type: none"> -The Scalp and its structure -Muscles of the scalp -Sensory nerve supply of the scalp -Arterial supply of the scalp -Venous drainage of the scalp -Lymph drainage of the scalp
6	The Face	<p>TO STUDY:</p> <ul style="list-style-type: none"> -Skin of the face -Sensory nerves of the face <ul style="list-style-type: none"> -Ophthalmic nerve and its branches -Maxillary nerve and its branches -Mandibular nerve and its branches -Arterial supply of the face <ul style="list-style-type: none"> -Facial artery and its branches -Venous drainage and its branches <ul style="list-style-type: none"> -Facial vein and its tributaries -Lymph drainage of the face -Bones of the face -Muscle of the face (muscles of the facial expression) <ul style="list-style-type: none"> -Muscles of the eyelids -Muscles of the nostrils -Muscles of the lips and cheeks
7	The Parotid Region	<p>TO STUDY:</p> <ul style="list-style-type: none"> -Parotid salivary gland <ul style="list-style-type: none"> -Type and position of the gland -Shape, lobes and processes of the gland -Parotid duct -Structures within the parotid gland -Relations of the parotid gland

		<ul style="list-style-type: none"> -Blood supply, lymph supply, and nerve supply of the gland. -Muscles of Mastication <ul style="list-style-type: none"> -Masseter muscle -The Temporal and infratemporal Fossae -Contents of the temporal fossa <ul style="list-style-type: none"> -Temporalis -Temporal fascia -Deep temporal nerves -Auriculotemporal nerve -Superficial temporal artery -Contents of the infratemporal fossa <ul style="list-style-type: none"> -Lateral pterygoid -Medial pterygoid -Mandibular division of the trigeminal nerve -Chorda tympani -Maxillary artery -Pterygoid venous plexus -Maxillary vein -Temporomandibular Joint <ul style="list-style-type: none"> -Articulation -Type of joints -Ligaments -Nerve supply and movements -The mandible -The hyoid bone
8	<p>The submandibular region</p>	<p>TO STUDY:</p> <ul style="list-style-type: none"> -Muscles of the submandibular region <ul style="list-style-type: none"> -Digastric -Mylohyoid -Hyoglossus -Geniohyoid -Genioglossus -Styloglossus -Salivary glands -Submandibular gland <ul style="list-style-type: none"> -type and parts of the gland -Relations of the superficial and deep parts. -Submandibular duct -Blood supply, lymph drainage, and nerve supply of the gland.

9	The Submandibular region	<p>TO STUDY:</p> <ul style="list-style-type: none"> - Sublingual gland -Type and location -Relations -Sublingual duct -Blood supply, lymph drainage, and nerve supply of the gland -Nerves of the submandibular regions -Lingual nerve and its branches -Submandibular ganglion -Glossopharyngeal nerve and its branches -Hypoglossal nerve and its branches -Blood vessels of the submandibular region -Facial artery and its branches and the facial vein -Lingual artery and its branches and the lingual vein
10	The Skull	<p>TO STUDY:</p> <p>Composition</p> <ul style="list-style-type: none"> -Anterior view of the skull -Lateral view of the skull -Posterior view of the skull -Superior view of the skull -Inferior view of the skull -Neonatal skull -The cranial cavity -Vault of the skull -Interior of the base of the skull -Anterior cranial fossa -Middle cranial fossa -Posterior cranial fossa -The meninges -Dura mater of the brain -Archnoid mater of the brain -Pia mater of the brain -The venous blood sinuses -Superior sagittal sinus -Inferior sagittal sinus -Straight sinus -Transverse sinus -Sigmoid sinus

		<ul style="list-style-type: none"> -Occipital sinus -Cavernous sinus -Superior and inferior petrosal sinuses -Hypophysis cerebri -Location and description and its blood supply
11	Revision & Examination	
B: The Neuroanatomy: Theory 20 hrs, discussion 10 hrs, practical 30 Hrs		
12	The Spinal Cord	<p>TO STUDY:</p> <ul style="list-style-type: none"> - Protection and coverings. - Meninges of the spinal cord. - Gross appearance of the spinal cord. - Structure of the spinal cord: <ul style="list-style-type: none"> - Nerve cell groups in the anterior gray columns. - Nerve cell groups in the posterior gray column. - Nerve cell groups in the lateral gray column. - The gray commissure and the central canal. - The white matter and its structure. - The ascending tracts of the spinal cord and their anatomical organization. - the function of the ascending tracts. <ul style="list-style-type: none"> - Lateral Spinothalamic Tract. - Anterior Spinothalamic Tract. - Fasciculus Gracilis and Fasciculus Cuneatus. - Posterior Spinocerebellar Tract. - Anterior spinocerebellar Tract.
13	The spinal cord	<p>TO STUDY:</p> <ul style="list-style-type: none"> - Other ascending Pathways <ul style="list-style-type: none"> - Spinotectal Tract. - Spinoreticular Tract. - Spino-olivary Tract. - Visceral Sensory Tract. - The descending tract of the spinal cord and their anatomical organization. - Function of the descending tracts. <ul style="list-style-type: none"> - Corticospinal Tract. - Reticulospinal Tracts. - Tectospinal Tract. - Rubrospinal Tract.

		<ul style="list-style-type: none"> - Vestibulospinal Tract. - Olivospinal Tract. - Descending autonomic fibers. - Intersegmental tracts. - Reflex arc. - Dermatome
14	<p>The Brain stem- The medulla oblongata</p>	<p>TO STUDY:</p> <ul style="list-style-type: none"> - Cranial meninges. - Venous blood sinuses. - The brainstem. - Gross appearance of the medulla oblongata. <ul style="list-style-type: none"> - Level of decussation of the pyramid. - Level of Decussation of Lemnisci. - Level of the Olives. - Olivary Nuclear Complex. - Vestibulocochlear Nuclei. - The ambiguous nucleus. - Central gray matter. - Level Just Inferior to the Pons.
15	<p>The Pons, the Midbrain and the cerebellum</p>	<p>TO STUDY:</p> <ul style="list-style-type: none"> - Internal Structure of the Pons. <ul style="list-style-type: none"> - Transverse section through the caudal part. - Transverse section through the cranial part. - Gross Appearance of the Midbrain. <ul style="list-style-type: none"> - The Internal Structure of the Midbrain. - Transverse Section at the Level of the Inferior Colliculi. - Transverse Section at the Level of the Superior Colliculi. - Gross Appearance of the Cerebellum. <ul style="list-style-type: none"> - Structure of the Cerebellum. - Structure of the Cerebellar Cortex. - Functional Areas of the Cerebellar Cortex <ul style="list-style-type: none"> - Intracerebellar Nuclei.
16	<p>The cerebrum</p>	<p>TO STUDY:</p> <ul style="list-style-type: none"> - Cerebrum and its subdivisions. - Diencephalon and its gross features. - Thalamus and its subdivisions. - Nuclei of the thalamus. <ul style="list-style-type: none"> - Anterior part.

		<ul style="list-style-type: none"> - Medial part. - Lateral part. - Dorsal tier of the nuclei. - Ventral tier of the nuclei. - Other nuclei of the thalamus. <ul style="list-style-type: none"> - Intralaminar nuclei. - Midline nuclei. - Reticular nuclei. - Medial geniculate body. - Lateral geniculate body.
17	The cerebrum	<p>TO STUDY:</p> <ul style="list-style-type: none"> - subthalamus - Epithalamus. <ul style="list-style-type: none"> - Habenular nucleus. - Pineal body. - Hypothalamus. <ul style="list-style-type: none"> - Hypothalamic nuclei. <ul style="list-style-type: none"> - Medial zone. - Lateral zone. - Relations of the hypothalamus. <ul style="list-style-type: none"> - Optic chiasma. - Tuber cinereum. - Mammillary bodies. - Third ventricle. - General appearance of the cerebral hemispheres. <ul style="list-style-type: none"> - Superolateral surface of the hemisphere. - Medial and inferior surfaces of the hemisphere. - Internal structure of the cerebral hemisphere. - Lateral ventricle.
18	The Basal nuclei.	<p>TO STUDY:</p> <ul style="list-style-type: none"> - Corpus striatum. <ul style="list-style-type: none"> - Caudate nucleus - Lentiform nucleus - Amygdaloid nucleus. - Claustrum. - White matter of the cerebral hemispheres. <ul style="list-style-type: none"> - Commissure fibers. - Association fibers. - Projection fibers.

		<ul style="list-style-type: none"> - Septum pellucidum. - Ventricles of the brain. - Blood supply of the brain. <ul style="list-style-type: none"> - Internal carotid artery. - Vertebral artery. - Circle of Willis. - Veins of the brain.
19	The Cranial nerves	TO STUDY: <ul style="list-style-type: none"> - Olfactory nerve - Optic nerve. - Oculomotor nerve. - Trochlear nerve. - Trigeminal nerve. - Abducent nerve. - Vestibulocochlear nerve. - Glossopharyngeal nerve. - Vagus nerve. - Accessory nerve. - Hypoglossal nerve.
20	The Functional areas of the cerebral cortex.	TO STUDY: <ul style="list-style-type: none"> - Functional area of the cerebral cortex. - Autonomic nervous system. - Brain injury
C:The Abdomen and Pelvis: Theory 20 hrs, discussion 10 hrs, practical 60 hrs		
21	The Structure of the abdominal wall	TO STUDY: <ul style="list-style-type: none"> - Bones. <ul style="list-style-type: none"> - Lumbar vertebrae. - Sacrum. - Coccyx. - Hip bones. - Structure of the anterior abdominal wall. <ul style="list-style-type: none"> - Skin. - Superficial fascia. - Deep fascia. - Muscles of the anterior abdominal wall. <ul style="list-style-type: none"> - External oblique muscle. - Internal oblique muscle. - Transversus abdominis.

		<ul style="list-style-type: none"> - Rectus abdominis. - Pyramidalis. - Rectus sheath. - Function of the anterior abdominal wall. - Fascia transversalis. - Extraperitoneal fat and the parietal peritoneum. - Nerves of the anterior abdominal wall. - Arteries of the anterior abdominal wall. - Veins of the anterior abdominal wall. <ul style="list-style-type: none"> - Superficial veins. - Deep veins. - Lymph drainage of the anterior abdominal wall. <ul style="list-style-type: none"> - Superficial lymph vessels. - Deep lymph vessels.
22	The Inguinal canal	<p>TO STUDY:</p> <ul style="list-style-type: none"> - Inguinal canal - Femoral sheath and canal. - Male external genital organs. <ul style="list-style-type: none"> - Spermatic cord and its structure. - Vas deference. - Testicular artery. - Testicular vein. - Lymph vessels. - Covering of the spermatic cord. - Scrotum. - Testis. - Epididymis. - Blood supply of the testis and epididymis. - Lymph drainage of the testis and epididymis. - Penis. <ul style="list-style-type: none"> - Root of the penis. - Body of the penis. - Glans penis. - Dorsal vessels and nerves of the penis. - Structure of the posterior abdominal wall. <ul style="list-style-type: none"> - Psoas muscle. - Quadratus lumborum muscle. - Iliopsoas muscle. - Fascial lining of the anterior abdominal wall.

23	The Abdominal Cavity	<p>TO STUDY:</p> <ul style="list-style-type: none"> - Peritoneum. - Intraperitoneal and retroperitoneal relationships. - Peritoneal ligament, Omenta, and mesenteries. - Peritoneum as seen on transverse section of the abdomen. - Peritoneum as seen on sagittal section of the abdomen. - Nerve supply of the peritoneum. - Esophagus (abdominal part). - Gastroesophageal sphincter. - Stomach. - Blood supply of the stomach. - Nerve supply of the stomach.
24	The intestine	<p>TO STUDY:</p> <ul style="list-style-type: none"> - Small intestine <ul style="list-style-type: none"> - Duodenum. - Parts of the duodenum. - Mucous membrane and duodenal papillae. - Blood and nerve supply and lymph drainage. - Jejunum and ileum. - Blood and nerve supply and lymph drainage. - Large intestine. <ul style="list-style-type: none"> - Cecum. - Blood and nerve supply and lymph drainage. - Appendix. - Blood and nerve supply and lymph drainage. - Ascending colon. - Blood and nerve supply and lymph drainage. - Transverse colon. - Blood and nerve supply and lymph drainage. - Descending colon. - Blood and nerve supply and lymph drainage. - Blood supply of the gastrointestinal tract. <ul style="list-style-type: none"> - Celiac artery. - Left gastric artery and its branches. - Splenic artery and its branches. - Hepatic artery and its branches. - Superior mesenteric artery and its branches. - Inferior mesenteric artery and its branches. - Marginal artery. - Venous drainage.

		<ul style="list-style-type: none"> - Portal vein and its tributaries. - Splenic vein. - Superior mesenteric vein. - Inferior mesenteric vein. - Left gastric vein. - Right gastric vein. - Cystic vein.
25	The Accessory Organs of the Gastrointestinal Tract	<p>TO STUDY:</p> <ul style="list-style-type: none"> - Liver. <ul style="list-style-type: none"> - Peritoneal ligaments of the liver. - Blood and nerve supply and lymph drainage. - Blood circulation through the liver. - Bile duct of the liver. - Gall Bladder. <ul style="list-style-type: none"> - Function. - Blood and nerve supply and lymph drainage. - Pancreas <ul style="list-style-type: none"> - Its structure. - Pancreatic duct. - Spleen. <ul style="list-style-type: none"> - Blood and nerve supply and lymph drainage. - Retroperitoneal space. - Kidneys. <ul style="list-style-type: none"> - Covering and renal structure. - Blood and nerve supply and lymph drainage. - Ureter. <ul style="list-style-type: none"> - Blood and nerve supply and lymph drainage. - Suprarenal glands. <ul style="list-style-type: none"> - Blood supply. - Arteries of the posterior abdominal wall. <ul style="list-style-type: none"> - Aorta and its branches. - Veins of the posterior abdominal wall. <ul style="list-style-type: none"> - Inferior vena cava and its tributaries. - Nerves of the posterior abdominal wall. <ul style="list-style-type: none"> - Lumbar plexus.
26	The Pelvis	<p>TO STUDY:</p> <ul style="list-style-type: none"> -Basic anatomy. - The orientation of the pelvis. - False pelvis.

		<ul style="list-style-type: none"> - True pelvis. - Structure of the pelvic wall. <ul style="list-style-type: none"> - Anterior pelvic wall. - Posterior pelvic wall. <ul style="list-style-type: none"> - Periformis muscle. - Lateral pelvic wall. - Obturature membrane. - Sacrotuberous ligament. - Sacrospinous ligament. - Obturator internus muscle. - Inferior wall of the pelvis. <ul style="list-style-type: none"> - Pelvic diaphragm. - Levator ani muscle. - Coccygeus muscle. - Pelvic fascia. <ul style="list-style-type: none"> - Visceral layer of the pelvic fascia. - Parietal layer of the pelvic fascia. - Nerves of the pelvis. <ul style="list-style-type: none"> - Sacral plexus and its relations and branches. - Branches of the lumbar fascia. <ul style="list-style-type: none"> - Lumbosacral trunk. - Obturator nerve. - Autonomic nerves. <ul style="list-style-type: none"> - Pelvic part of the sympathetic trunk. - Pelvic splanchnic nerve. - Superior hypogastric plexus. - Inferior hypogastric plexus.
27	The Arteries of the pelvis	<p>TO STUDY:</p> <ul style="list-style-type: none"> - Common iliac artery. - External iliac artery. - Arteries of the true pelvis <ul style="list-style-type: none"> - Internal iliac artery and its branches. - Superior rectal artery. - Ovarian artery. - Median sacral artery. - Veins of the pelvis. <ul style="list-style-type: none"> - External iliac vein. - Internal iliac vein. - Median sacral vein. - Lymphatics of the pelvis.

		<ul style="list-style-type: none"> - Joints of the pelvis. <ul style="list-style-type: none"> - Sacroiliac joints. - Symphysis pubis. - Sacrococcygeal joint. - Sex differences of the pelvis.
28	The Contents of the pelvic cavity	<p>TO STUDY:</p> <ul style="list-style-type: none"> - Sigmoid colon. <ul style="list-style-type: none"> - Location and description. - Relations. - Blood and nerve supply and lymph drainage. - Rectum. <ul style="list-style-type: none"> - Location and description. - Relations. - Blood and nerve supply and lymph drainage. - Pelvic viscera of the male. <ul style="list-style-type: none"> - Ureter. - Urinary bladder. <ul style="list-style-type: none"> - Location and description. - Relations. - Blood and nerve supply and lymph drainage. - Male genital organs. <ul style="list-style-type: none"> - Vas deferens. - Seminal vesicles. <ul style="list-style-type: none"> - Blood supply and lymph drainage. - Function. - Ejaculatory duct. - Prostate. <ul style="list-style-type: none"> - Location and description. - Relations. - Structure of the prostate. - Function of the prostate. - Blood and nerve supply and lymph drainage. - Prostatic urethra. - Visceral pelvic fascia. - Peritoneum.
29	The Pelvic viscera of the female	<p>TO STUDY:</p> <ul style="list-style-type: none"> - Ureter. - Urinary bladder. - Female genital organs.

		<ul style="list-style-type: none"> - Ovaries. <ul style="list-style-type: none"> - Location and description. - Function. - Blood and nerve supply and lymph drainage. - Uterine tube. <ul style="list-style-type: none"> - Location and description. - Function. - Blood and nerve supply and lymph drainage. - Uterus. <ul style="list-style-type: none"> - Location and description. - Relations. - Function. - Position of the uterus. - Structure of the uterus. - Blood and nerve supply and lymph drainage. - Supports of the uterus. - Uterus in the child. - Uterus after menopause. - Uterus in pregnancy. - Role of the uterus in labor. - Vagina. <ul style="list-style-type: none"> - Location and description. - Relations. - Function. - Blood and nerve supply and lymph drainage. - Supports of the vagina - Visceral pelvic fascia. - Visceral pelvic fascia and infection. - Peritoneum. - Broad ligament and its parts and contents.
30	The Perineum	<p>TO STUDY:</p> <ul style="list-style-type: none"> - Pelvic diaphragm. - Anal canal. <ul style="list-style-type: none"> - Structure. <ul style="list-style-type: none"> - The mucous membrane of the upper half. - The mucous membrane of the lower half. - Muscular coat. - Anal sphincter. <ul style="list-style-type: none"> - Internal anal sphincter. - External anal sphincter.

		<ul style="list-style-type: none"> - Pudendal nerve and its branches. - Pudendal artery and its branches. - Male urogenital triangle. - Male urethra. <ul style="list-style-type: none"> - Prostatic part. - Membranous part. - Penile part. - Sphincter urethrae muscle. - Bulbourethral glands. - Female urogenital triangle. <ul style="list-style-type: none"> - Vulva. - Clitoris. - Mons pubis. - Labia majora. - Labia minora. - Vestibule. - Greater vestibular glands. - Female Urethra.
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Methods of assessment

No	Exam	Type of assessment		Marks
1	First term	Theoretical part	Quizzes in the same theoretical lectures	2
			End term written exam (60% MCQs &/or EMQ & 40% essay questions, fill in the blanks and draw)	8
		Practical part	Practical exam in the Laboratory on the: <ul style="list-style-type: none"> • Pre-dissected specimens. • Plastic specimens. • Bones. • Radiological films. 	5
2	Second term	Theoretical part	Quizzes in the same theoretical lectures	2
			End term written exam (60% MCQs &/or EMQ & 40% essay questions, fill in the blanks and draw)	8
		Practical part	Practical exam in the Laboratory on the: <ul style="list-style-type: none"> • Pre-dissected specimens. • Plastic specimens. • Bones. • Radiological films. 	5
3	Final	Theoretical part	End term written exam (60% MCQs &/or EMQ & 40% essay questions, fill in the blanks and draw)	50
4		Practical part	Practical exam in the Laboratory on the: <ul style="list-style-type: none"> • Pre-dissected specimens. • Plastic specimens. • Bones. • Radiological films. 	20
5	Total			100

Suggested Reading List:

1. Clinical Anatomy by Regions, 8th Edition, By: **Richard S. Snell MD, PhD.**
2. Clinical Neuroanatomy, 7th Edition, By: **Richard S. Snell**
3. Gray's Anatomy for Students By: **Richard L. Drake et.al**
4. Grant's Atlas of Anatomy, 12th Edition ,By: **Anne MR Agur, Arthur F Dalley**
5. Cunningham's anatomy

Department of Human Anatomy

Subject: Embryology

Academic year: Second year

Course coordinator: Prof. Dr. Mahdi Salah Shalal

Professor in Histology and Embryology, Department Human Anatomy

College of Medicine, University of Anbar

Teaching staff:

- One Professor.
- one lecturer.

Allocated marks: 100 marks.

Course duration: One academic year.

Introduction:

Human development is one of the most exciting topics to study not only as a medical student, but also for our fundamental understanding of the human body. Of all health issues in Medicine, fertility and reproduction is a topic that will affect everyone. It necessary for the student of medicine to study the development of human organs day by day to have a better understanding to able to differentiate between the normal and abnormal human fetus.

The Anatomy Department in the College of Medicine, University of Anbar hosts the medical students for theoretical course for 30 hours/year. Our aim is to enhance the knowledge of our students and let them be aware about the first steps in studying the development of the human body organs to asses them in their clinical life.

Overall Aims:

The course is designed to introduce the student to:

1. Medical terminology and methods used in gathering information.
2. Understanding of the formation of different organs of the human body.
3. The correlation between of different embryonic structures and the formation of the human body organs.
4. Understand how to differentiate between normal embryonic structures and the congenitally defect structures.
5. The beginnings of an understanding of how to pursue independent and self-learning of how the different embryonic structures develop into organs

General Objectives:

At the end of the course students should be able to:

- Describe the cell division and the arrangement of the chromosomes in the formation of fertilized ovum.
- Describe the changes takes place in the ovary and uterus, the division of the fertilized ovum, and the process of cell implantation in the wall of the uterus.
- To know the formation of different types of cells and organs and the changes occurred in the shape of the fetus with the progress of time.
- Learning the details of the formation of the placenta, umbilical cord, the embryonic membranes, the formation of twins, and the congenital defects.
- The correlation between the development of different embryonic structure and its congenital defects.

Components, duration and units of the curriculum

No	Components	Duration	Unit
1	Theoretical lectures	30 hours	2
3	Total	30 hours	2

Places of completion the curriculum:

1. Lecture hall in the college
2. Anatomical lab in the college

Material used for completion the curriculum:

1. Audiovisual aids.
2. Interaction with the students through questions.
3. Power point presentation.
4. Computer.
5. Data show.
6. Embryologic charts.
7. Videos, diagrams and posters.

Syllabus:

Teaching Techniques:

Teaching will be conducted using the **theoretical Sessions:**

- lectures were designed to cover most of topics of the embryological development of human body.
- The time of the lecture is 60 minutes.
- There are one theoretical lecture/week.

Weeks	Subject
1	Gametogenesis: Cell divisions leading to mature ova and sperms.
2	Ovulation, fertilization, and implantation. Ovarian and menstrual cycles.
3	Cleavage and blastocyst formation, appearance and distribution of mesoderm.
4	Fate of trophoblast, the early placenta, the fate of inner cell mass.
5	Formation of notochord, neural tube and crest, growth of amnion.
6	Fate of ectodermal germ layer.
7	Fate of mesodermal germ layer.
8	Fate of endodermal germ layer, effect of folding on gut and body.
9	Major changes from third month to birth. Fetal membrane and placenta.
10	Teratogenic agents: Examples of toxic effects at sensitive or critical age.
11	Development of muscles, fate of somites.
12	Development of cartilage and bones. The limb buds.

13	Kidneys: fate of pro-, meso-, and metanephros. Ascent of kidneys.
14	Ureter, urinary bladder, urachus and fate of umbilical vessels.
15	Primitive testis, ovary: cell migration from wall of yolk sac.
16	Descent of gonads, fate of mesonephric and paramesonephric ducts.
17	External genitalia of male and female.
18	CVS: Formation of the heart tube, its foldings and divisions.
19	Cardiac septa and chamber formation.
20	Big vessels.
21	Fetal circulation and changes after birth.
22	GIT: Elongation and rotation of primitive gut. Foregut, liver and pancreas.
23	Midgut: Parts and rotation to final position.
24	Hindgut: Cloaca and urorectal septum, the fate of the area.
25	Pharyngeal arches: The first arch, nose and upper lip.
26	Fate of other arches, the respiratory diverticulum, thyroid, parathyroid, and thymus.
27	CNS: changes in the neural tube, brain vesicles and flexures.
28	Sensory and motor nuclei, cranial and spinal nerves, meninges.
29	Skin, hair, mammary gland.
30	General review.

Methods of assessment

No	Exam	Type of assessment		Marks
1	First term	Theoretical part	Quizzes in the same theoretical lectures	2
			End term written exam (60% MCQs &/or EMQ & 40% essay questions)	13
2	Second term	Theoretical part	Quizzes in the same theoretical lectures	2
			End term written exam (60% MCQs &/or EMQ & 40% essay questions)	13
3	Final	Theoretical part	End term written exam (60% MCQs &/or EMQ & 40% essay questions)	70
5	Total			100

Suggested Reading List:

- Langman's Medical Embryology by T. W. Sadler