Microbiology department in Medical college- Thi-Qar university is an one branch of basic science branches which deals with students in first and third stages as this branch takes care of many of the scientific activities enhancing these students to go through regular scientific plan putted in a clear schedule increasing their theoretical knowledge given in simple way to be applied practically. There are many important objectives that govern all efforts of lecturers in this department and directing them toward the main aims of the medical college.

Main objectives of Microbiology Department:

1. The teaching of theoretical and practical sides of clinical and basic sciences such as medical biology for students in first stage and parasitology and microbiology (Immunology, Bacteriology and Virology) for students in third stage of medicine student.
2. The establishment of courses in the diagnosis of bacterial, viral, fungal and parasitic diseases.
3. The Contribution to work in the field of laboratory diagnosis, through the placement of the branch employees to work in the laboratories of governorate hospitals.
4. Enrollment of some branch members to complete their higher studies in the precise sub specialty to get master's and doctorate degrees.
5. Participation in many scientific and medical conferences in the field of clinical and pure sciences inside and outside the country.
6. Seeking to establish a specialized center for the early diagnosis of cancer diseases and prenatal congenital deformities.

7. The contribution with other researchers in the completion of scientific research that desperately needed in the upgrading of health in our geographical region.

3rd year immunology curriculum

15 Hours Theory (1 Hours/ 15 Weeks)
8 Hours Practical (2 Hours/ 4 Weeks)..**Lecturer: Dr. Talib Hasan Ali**

Objectives:

The objective of this course is to learn the structural features of the components of the immune system as well as their functionsduring the immune response and its involvement in health and disease.

The primary aim of this course is understanding mechanisms involved in immune system development and responsiveness.

Teaching and learning methods:
Lectures, laboratory work.
Assessment: Homeworks, quizzes, examination, poster discussion.
Text books approved : 1) Medical Microbiology **by Jawetz, Melnick** 26th ed**., 2013.**

2) Immunology **by** kuby 5th ed**., 2002. 3)** Foundations in Microbiology **by** Talaro and Talaro 3rd ed., **2005.Theoretical Lectures:**

The week	The title	Lecture objective
1st week	The Nature of Host Defenses	To understanding of The series of defenses that protect us against invasion by harmful microbes and other foreign matter. • Defenses development and specificity. •Three lines of defenses: 1st line chemical, physical and genetic barriers. second line defenses such as phagocytosis, inflammation, complement system, and interferon and third line defenses: acquired immunity

2nd week	Systems Involved in immune	To understanding of • The systems that are most involved in immune function (the blood, lymphoid organs and tissues, and theRES). • White blood cells, types and formation in the red bone marrow. • Some of their complex functions relating to phagocytosis,inflammation, antibody production, and pathogen killing. • The lymphoid organs (spleen, lymph nodes, thymus, GALT, MALT) their importanceinsurveillance and immune reactions.
3rd week	Nonspecific Immune Reactions	To understanding of • Inflammation as protective response to injury. •Types of chemical mediators, that releasedby cells during inflammation and other immune responses. • Interferon is a nonspecific immune mediator that inhibits the replicationof viruses and regulates a variety of immune responses. • The complement system sequentially reaction to lyse cells and viruses.
4th week	Phagocytes	To understanding of • Phagocytes as specialized cells that function in engulfment andclearance of foreign molecules, cells, viruses, and particles. Their numerous enzymes and toxic chemicals to carry out phagocytosisfunction.
5th week	The Acquisition of Specific immunity	To understanding of Acquired specific immunities provided by B and T lymphocytes that protect us against infection and their role to survival.
6th week	The origin of diversity and specificity	To understanding of •Genetically programmed cells to react with foreignsubstances (antigens).

		•Glycoprotein receptors that dictate their specificityand reactivity. • B lymphocytes receptors, T lymphocytes receptors, and macrophages receptors such as MHC and HLA. • Differentiation of lymphocytes that create of genetically differentclones that each have a unique specificity for antigen. • The B cells and T cell maturity and migration to lymphoid tissues. • Antigens of foreign cells, viruses, and molecules that capable of triggering immune reactionsby lymphocytes. • The B and T cells react with antigens through a complex series ofmechanisms
7th week	The Classes of Immunoglobulins	To understanding of • B cells activated by antigen giving riseto plasma cells that secrete antibodies (humoral immunity) and longlivedmemory cells. • Antibodies binding sites and their roles in agglutination, opsonization, complement fixation, andneutralization. • The amount of antibodies during immediate and memory reactions.
8th week	Immunization and vaccination	To understanding of • The categories of natural, artificial, active,and passive immunities. • Powerful medical tools to artificially induce protective immunities. • Immunization by means of passive and active methods. • Vaccines types: dead or live cells and viruses, parts of cells or viruses, or by recombinant DNA

		techniques.
9th week	Serological and immune tests	To understanding of • Reactions between antibodies and antigens that can be used in diagnosis of disease and identification of pathogens. • Serology testing of a patient's blood serum that can indicate a current or past infection and the degree of immunity. • Tests that produce visible interactions of antibodies and antigens include agglutination, precipitation, and complement fixation.
10th week	Serological and immune tests	To understanding of • Assays can be used to separate antigens and antibodies and visualize them with radioactivity or fluorescence (such as immunelectrophoresis, Western blot, and direct and indirect immunoassays.
11th week	Disorders in Immunity	To understanding of • The several types of dysfunctions (immunopathologies). •The dysfunctions that are due to abnormally heightened responses to antigens (allergies, hypersensitivities, and autoimmunities). •the dysfunctions that are due to the reduction or loss in protective immune reactions due to genetic or environmental causes such as (immunodeficiencies and cancer).
12th week	Disorders in Immunity	To understanding of • Some immune damage that caused by normal actions that directed at foreign tissues placed in the body for therapy, such as transfusions and transplants. • Hypersensitivities divisions into immediate, antibody-mediated, immune complex, and delayed allergies. • Allergens that cause a hypersensitive or allergic response.
13th week	Disorders in Immunity	To understanding of • The immediate type of allergy that mediated by special types of B cells that produce IgE. • IgEinducing mast cells to release allergic

		chemicals such as histamine.
14th week	Disorders in Immunity	To understanding of • Examples of immediate allergies are atopy, asthma, food allergies, and anaphylaxis. • Another type of hypersensitivity arises from the action of other antibodies (IgG and IgM) that can fix complement and lyse foreign cells. • Immune complex reactions that caused by circulating antibodies against foreign molecules and their accumulating in tissues and organs.
15th week	Disorders in Immunity	To understanding of • Autoimmune diseases. The production of B and T cells that sensitized to react with the body's natural molecules. Some examples of these diseases (rheumatoid arthritis, systemic lupus erythematosus, myasthenia gravis, and multiple sclerosis). • T cells in delayed-type hypersensitivities.
16th week	Immunodeficiency diseases	To understanding of •Immunodeficiencies pathologies in which B and T cells and other immune cells are missing or destroyed. • The primary outcome of immunodeficienciesas in recurrent infections and lack of immune competence.
17th week	Cancer	To understanding of Cancer as an abnormal overgrowth of cells due to a genetic defect and the lack of effective immune surveillance.

Practical sessions

1. Introduction to Immunology laboratory
2. Antibody-Antigen (Ab-Ag) reaction (hemagglutination)
3. (Ab-Ag) reaction (precipitation)
4. Electrophoretic Techniques (Immunoelectrophoresis)
5. Ab-Ag reaction (complement fixation)
6. Ab-Ag reaction (ELISA) and Immunoblot.
7. Ab-Ag reaction (Immunoflourescence test and Radio immune assay)
8. Cell isolation, Cell counting and functional assessment

30 Hours Theory (2 Hours/Week)
45 Hours Practical (3 Hours/Week)

Objectives:
a) Introduction to the science of medical biology.
b) Understanding the basis of genetics and medical inheritance.
c) Study of the basic body tissues.

1. Introduction to histology.

    - The types of cells.
    - The epithelial tissues.
    - The connective tissues.
    - The muscular tissues.
    - The nervous tissues.

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3rd year Virology curriculum

19 Hours Theory (1 Hours/ 19 Weeks)
10 Hours Practical (2 Hours/ 5 Weeks)..Lecturer: Dr. Mohammed Jasim Mohammed

Objectives:

The objective of this course is to learn about the general characteristics, structure, replication and properties of RNA and DNA viruses in addition to a view of the differences among viruses and other pathogens as well as the physical and chemical factors affected viruses. Also, it includes an overview of the most important viral diseases affected human with focus on their diagnosis, treatment and prevention.

The primary aim of this course is to make easy for student to understand what are viruses and how they can distinguish the viral infection in a way that increase their knowledge

Teaching and learning methods:
Lectures, laboratory work.
Assessment: Homework, quizzes, examination, poster and mini-research discussion.
References: **Main book:** Medical Microbiology, **Jawetz, Melnick** 26th ed.,2013
Theoretical Lectures:

The week	The title	Lecture objective
1st week	Virology introduction-properties and classification	To understading of the follwings 1-General properties of viruses. 2-Define structure of viruses. 3- classification of RNA and DNA viruses. 4-Evolutionary Origin of Viruses and Universal System of Virus Taxonomy.

2nd week	Chemical composition of viruses	To understanding of the define compartment of virus which includes Viral protein, viral nucleic acid, viral lipid envelopes, viral glycoproteins, cultivation and assay of viruses, detection of virus-infected cells, Quantitation of viruses,physical and biologic methods.
3rd week	Reaction of viruses to physical and chemical agents	To understanding of different physical and chemical factors affected viruses such as 1-Heat & Cold, 2- Stabilization of Viruses by Salts 3-pH, 4-Radiation, 5-Photodynamic inactivation, 6-Ether Susceptibility, 7-Detergents, Formaldehyde, Antibiotics & Other Antibacterial Agents,
4th week	Replication of Viruses: Virus Growth Cycle	To understanding of • An Overview of Replication of RNA and DNA viruses, General Steps in Viral Replication Cycles, •
5th week	Expression of Viral Genomes and Synthesis of Viral Components	To understanding of 1- Morphogenesis and Release, 2- Genetics of Animal Viruses, Viral Vectors,
6th week	Pathogenesis of Viral Diseases	To understanding of 1- Pathogenesis of Viral Diseases: 2- Steps in Viral Pathogenesis, 3- Viral Persistence: Chronic & Latent Virus Infections
7th week	Viral infections (1)	To understanding of 1- Overview of Acute Viral Respiratory Infections, 2- Overview of Viral Infections of the GIT,
8th week	Viral infections (2)	To understanding of

		1- Overview of Viral Skin Infections, 2- Overview of Viral Infections of the CNS, 3- Overview of Congenital Viral Infections, 4- Effect of Host Age
9th week	RUBELLA AND OTHER CONGENITAL VIRAL INFECTIONS	To understanding of 1- Transmission & Epidemiology, 2- Pathogenesis & Immunity, 3- Clinical Findings, 4- CONGENITAL RUBELLA SYNDROME (CRS), Lab Diagnosis, Treatment, Prevention, Diagnosis of Congenital viral infections
10th week	RNA non-enveloped Picornaviruses ENTEROVIRUSE	To understanding of 1- Properties of Picornaviruses, Picornavirus Replication, 2- ENTEROVIRUSES, Poliovirus, 3- Pathogenesis, Pathology, Clinical Findings, Laboratory Diagnosis,
11th week	Coxsackieviruses RHINOVIRUSES	To understanding of 1- Coxsackieviruses and their Clinical Findings, Transmission & Epidemiology, 2- RHINOVIRUSES and their Transmission & Epidemiology 3- Group B Specific Diseases: ECHOVIRUSES
12th week	Rotaviruses and some examples of different viruses	To understanding of 1- Pathogenesis, clinical findings, lab diagnosis, epidemiology, treatment and control, 2- Caliciviruses, 3- Astroviruses, 4- Viruses cause GIT infections, 5- Overview on Viruses that cause Common cold, 6- Overview on Viruses that cause lower respiratory tract infections, 7- Overview on Viruses that cause Genital tract and sexually transmitted Infections.
13th week	Rabies virus and other CNS Viral infections	To understanding of 1- Rabies virus and Properties of the Rabies Virus, 2- Rabies Virus Replication, 3- Rabies 4- Pathogenesis & Pathology, Clinical Findings, Laboratory Diagnosis, Prevention, Treatment & Control, Other Viral CNS infections,
14th week	Hepatitis A-E Viruses: An Overview (1)	To understanding of 1- Types of Hepatitis and General Characteristics of Hepatitis Viruses, 2- Hepatitis A Virus, 3-Transmission & Epidemiology, Pathogenesis & Immunity, 4- Clinical findings, Treatment & Prevention, Lab Diagnosis,

15th week	Hepatitis A-E Viruses: An Overview (2)	To understanding of 1- Hepatitis B Virus, 2- Transmission & Epidemiology, Replication, Pathogenesis & Immunity, clinical findings, lab diagnosis, treatment, prevention, 3-HEPATITIS C VIRUS (HCV), Hepatitis C Life Cycle, Transmission & Epidemiology, Pathogenesis & Immunity, Clinical Findings, lab diagnosis, treatment, prevention
16th week	Hepatitis A-E Viruses: An Overview (3)	To understanding of 1-Hepatitis D Virus, 2- Transmission and Epidemiology, Hepatitis D – 3- Clinical Features, lab diagnosis, treatment and prevention, Hepatitis E Virus,
17th week	Herpesvirus	To understanding of 1-Introduction, important properties of herpesviruses, Structure & Composition, 2- Classification, Herpesvirus Replication, 3-Overview of Herpesvirus Diseases, 4-Properties of the Viruses, Pathogenesis & Pathology, Primary Infection, Latent Infection, Clinical Findings, 5-Oropharyngeal Disease, 6-Keratoconjunctivitis, 7-Neonatal Herpes, Infections in Immunocompromised Hosts, lab diagnosis,
18th week	Chemotherapy of viruses, antiviral agents, vaccines	1- To understand all mechanisms followed by different Types of antiviral chemotherapies, 2- To know about the different kinds of vaccines used for prevention of viral infections
19th week	Measles and mumps viruses	Introduction, important properties of measles and mumps viruses, pathogenesis, clinical findings, lab diagnosis, treatment, prevention, types of vaccines.

Practical sessions

The week	The title	Lecture objective
1st week	Introduction	To understading of the follwings What is the virus ??, Methods of Diagnosing Viral Infections, Surface protein of the virus,
2nd week	**Virus Isolation Using three living**	To understanding of the Isolation of the virus

	systems	using three living systems, Lab Animals, Chick emberyo, tissue culture
3rd week	**Types of tissue cultures**	To understanding of **Primary tissue culture**, advantages, disadvantages, **Semi-continuous** cell cultures, advantages, disadvantages, **Continuous (Cell line)**, advantages, disadvantages, examples of isolated viruses **(SARS- infected Vero cells**)
4th week	**Demonstration on Tissue Culture used for virus isolation**	To understanding of **Preparation of primary tissue culture,** • **procedure, Counting of cells**
5th week	**Inoculation of clinical sample in living system**	**A-Inoculation of clinical sample in tissue culture, how to harvest Rabbit kidney for tissue culture, procedure, Inoculation of clinical sample in tissue culture, Recognition of virus growth,**

3rd year bacteriology curriculum

60 Hours Theory (2 Hours/ 30 Weeks)
50 Hours Practical (2 Hours/ 25Weeks)..Lecturer: Dr. Hayder Kh. Shnan; Dr. Saad Abdil Aziz Atia; Dr. Zainab D. Dgaim

Objectives:

The objective of this course is to learn the basic and systematic microbiology especially medical bacteriology.

The primary aim of this course is understanding characteristic structures and pathogenicity of medical bacteriology as well as methods of diagnosis and understanding new procedures of prevention, and treatments of diseases.

Teaching and learning methods:
Lectures, laboratory work.
Assessment: Homeworks, quizzes, examination, poster discussion.

Theoretical Lectures:

The week	The title	Lecture objective
1st week	Introduction of medical microbiology and bacterial structures	To understanding of 1-Science of medical microbiology. 2-Structures of bacterial cell envelope. 3-Nuclear materials, plasmid and transposons 4- Study the external appendages and endospores
2nd week	Bacterial genetics and gene transfer	To understanding of 1- Science of genetics 2- DNA and RNA types 3- Mutations 4- Methods of gene transfer
3rd week	Host-pathogen relations	To understanding of 1- Infectious process 2- Attachment of microbial agent with host cell. 3- Invasion process 4- Antiphagostic factors 5- Intracellular pathogenicity
4th week	Sterilization and disinfection	To understanding of 1- Methods of sterilization and disinfection 2- Physical process 3- Chemical process

5th week	Antimicrobial therapy	To understanding of 1- Types of antibiotics 2- Mode of its action 3- Methods of resistance 4- Origin of drug resistance 5- Side effects of antibiotic	
6th week	Staphylococci species	To understanding of • The Staphylococci characteristics. • Morphology and Identification. •Antigenic Structure. • Pathogenesis. • Pathology. • Clinical Findings. • Diagnostic Laboratory Tests • Treatment. • Epidemiology, Prevention, & Control.	
7th week	Streptococci species	To understanding of • The Streptococci characteristics. • Morphology and Identification. • Antigenic Structure. • Pathogenesis. • Pathology. • Clinical Findings. • Diagnostic Laboratory Tests • Treatment. • Epidemiology, Prevention, & Control.	
8th week	Neisseria species	To understanding of • The *Neisseria*characteristics. • Morphology and Identification. • Antigenic Structure. • Pathogenesis. • Pathology. • Clinical Findings. • Diagnostic Laboratory Tests • Treatment. • Epidemiology, Prevention, & Control.	
9th week	*Campylobacter*species	To understanding of • The *Campylobacter*characteristics. • Morphology and Identification. • Antigenic Structure. • Pathogenesis. • Pathology.	

		• Clinical Findings. • Diagnostic Laboratory Tests • Treatment. • Epidemiology, Prevention, & Control.
10th week	*Helicobacter pylori*	To understanding of • The *H. pylori*characteristics. • Morphology and Identification. • Antigenic Structure. • Pathogenesis. • Pathology. • Clinical Findings. • Diagnostic Laboratory Tests • Treatment. • Epidemiology, Prevention, & Control.
11th week	*Legionella* species	To understanding of • The *Legionella* characteristics. • Morphology and Identification. • Antigenic Structure. • Pathogenesis. • Pathology. • Clinical Findings. • Diagnostic Laboratory Tests • Treatment. • Epidemiology, Prevention, & Control.
12th week	*Listeria* species	To understanding of • The *Listeria* characteristics. • Morphology and Identification. • Antigenic Structure. • Pathogenesis. • Pathology. • Clinical Findings. • Diagnostic Laboratory Tests • Treatment. • Epidemiology, Prevention, & Control.
13th week	The Vibrios	To understanding of • The Vibrios characteristics. • Morphology and Identification. • Antigenic Structure. • Pathogenesis. • Pathology. • Clinical Findings. • Diagnostic Laboratory Tests • Treatment. • Epidemiology, Prevention, & Control.
14th week	*Corynebacterium*	To understanding of • The *Corynebacterium*characteristics. • Morphology and Identification. • Antigenic Structure.

		• Pathogenesis. • Pathology. • Clinical Findings. • Diagnostic Laboratory Tests • Treatment. • Epidemiology, Prevention, & Control.
15th week	Rickettsia and Related Genera	To understanding of • The Rickettsiacharacteristics. • Morphology and Identification. • Antigenic Structure. • Pathogenesis. • Pathology. • Clinical Findings. • Diagnostic Laboratory Tests • Treatment. • Epidemiology, Prevention, & Control.
16th week	*Brucellae*	To understanding of • The *Brucellae* characteristics. • Morphology and Identification. • Antigenic Structure. • Pathogenesis. • Pathology. • Clinical Findings. • Diagnostic Laboratory Tests • Treatment. • Epidemiology, Prevention, & Control.
17, 18th week	Enteric Gram Negative Rods (E. coli, klebsiella, proteus, pseudomonas, provencia group) Salmonella, Shigella	To understanding of • The Enteric Gram Negative Rods characteristics. • Morphology and Identification. • Antigenic Structure. • Pathogenesis. • Pathology. • Clinical Findings. • Diagnostic Laboratory Tests • Treatment. • Epidemiology, Prevention, & Control.
19th week	*Acinetobacter* species	To understanding of • The *Acinetobacter*characteristics. • Morphology and Identification. • Antigenic Structure. • Pathogenesis. • Pathology. • Clinical Findings. • Diagnostic Laboratory Tests

		• Treatment. • Epidemiology, Prevention, & Control.	
20,21th week	Complex aerobic Actinomycetes	To understanding of • The Actinomycetes characteristics. • Morphology and Identification. • Antigenic Structure. • Pathogenesis. • Pathology. • Clinical Findings. • Diagnostic Laboratory Tests • Treatment. • Epidemiology, Prevention, & Control.	
22th week	Mycobacteria	To understanding of • The Mycobacteria characteristics. • Morphology and Identification. • Antigenic Structure. • Pathogenesis. • Pathology. • Clinical Findings. • Diagnostic Laboratory Tests • Treatment. • Epidemiology, Prevention, & Control.	
23th week	*Bacillus* genus	To understanding of • The *Bacillus*characteristics. • Morphology and Identification. • Antigenic Structure. • Pathogenesis. • Pathology. • Clinical Findings. • Diagnostic Laboratory Tests • Treatment. • Epidemiology, Prevention, & Control.	
24th week	*Clostridium* genus	To understanding of • The *Clostridium* characteristics. • Morphology and Identification. • Antigenic Structure. • Pathogenesis. • Pathology. • Clinical Findings. • Diagnostic Laboratory Tests • Treatment. • Epidemiology, Prevention, & Control.	
25th week	Borella, Leptospira	To understanding of • The Borella, Leptospira characteristics. • Morphology and Identification. • Antigenic Structure. • Pathogenesis. • Pathology.	

		• Clinical Findings. • Diagnostic Laboratory Tests • Treatment. • Epidemiology, Prevention, & Control.	
26h week	Spirochaetes : T . pallidum,	To understanding of • The Spirochaetes : T . pallidum, Borella, Leptospira characteristics. • Morphology and Identification. • Antigenic Structure. • Pathogenesis. • Pathology. • Clinical Findings. • Diagnostic Laboratory Tests • Treatment. • Epidemiology, Prevention, & Control.	
27,28th week	Pasterurella : Hemophilic , Bordetella	To understanding of • The Pasterurella : Hemophilic , Bordetella characteristics. • Morphology and Identification. • Antigenic Structure. • Pathogenesis. • Pathology. • Clinical Findings. • Diagnostic Laboratory Tests • Treatment. • Epidemiology, Prevention, & Control.	
29,30th week	• Chlamydia , normal microbial flora of human body	To understanding of • The Chlamydia , normal microbial flora of human body characteristics. • Morphology and Identification. • Antigenic Structure. • Pathogenesis. • Pathology. • Clinical Findings. • Diagnostic Laboratory Tests • Treatment. • Epidemiology, Prevention, & Control.	

Practical sessions

1-Tools and biosafety
2-Sterilization
3-Antibiotic susceptibility test
4-Methods of bacterial counting and measuring bacterial growth
5-Bacterial staining
6-Culturing media
7-Growth characteristics

8-General urine examination
9-Biochemical tests
10-Staphylococci
11-Streptococci
12-*Neisseriae*
13-Aerobic spore-forming bacilli
14-Anaerobic spore-forming bacilli
15-Enterobacteriaceae
16-Non-Lactose Fermentors
17-*Pseudomonas aeruginosa*
18-Vibrio
19-*Listeria*
20-*Legeonella*
21-*Helicobacter*
22-*Corynebacterium* and *Mycobacterium*

1st year Medical biology curriculum

30 Hours Theory (2 Hours/ 30 Weeks)
45Hours Practical (2 Hours/ 25 Weeks)

Objectives:

The objective of this course is to learn:
a) Introduction to the science of medical biology.
b) Understanding the basis of genetics and medical inheritance.
c) Study of the basic body tissues.

Teaching and learning methods:
Lectures, laboratory work.
Assessment: Home works, quizzes, examination, poster discussion.

Cell biology part:

The week	The title	Lecture objective
1st week	Introduction of Biology	To understanding of • Sciences of Biology. • Types of the organisms. • Kingdoms of life.
2nd week	Types of cells	To understanding of • unicellular organisms • multicellular organisms • differentiation between them • Protoplasm • Physical, chemical and nature properties
3rd week	Tools of cell biology	To understanding of • Microscope • Types of microscope.
4th week	Composition of The cell	To understanding of • The cytoplasm. • Endoplasmic reticulum. • Golgi apparatus. • Ribosomes
5th week	Composition of The cell	To understanding of • Lysosomes • Peroxisomes. • Mitochondria • Vacuoles.

		• Centrosome. • Cilia and flagella. • Non- living inclusion bodies.	
6th week	Cell structure	To understanding of • The Nucleus. • Nuclear envelope. • Nucleoplasm. • Nucleolus.	
7th week	Cell structure	To understanding of • Cytoskeleton • Intermediate filaments. • Microtubules. • Microfilaments.	
8th week	Plasma membrane	To understanding of •Structure and function •Membrane lipids. •Membrane protein diversity.	
9th week	How molecules cross the plasma membrane	To understanding of •Passive ways. •diffusion. •Osmosis. •Facilitated transport.	
10th week	How molecules cross the plasma membrane	To understanding of •Active transport. •Extracellular matrix. •Types of junctions.	
11th week	Cell division	To understanding of •Chromosome Composition. • Cell cycle. • Mitosis. • Mitosis phases.	
12th week	Meiosis	To understanding of •Meiosis. • Mitosis phases • Antigenic Structure. •Gametogenesis. •spermatogenesis. •Oogenesis.	

Histology part:

- Introduction to histology.
- The types of cells.
- The epithelial tissues.
- The connective tissues.

- The muscular tissues.
- The nervous tissues.

Genetic part:
1-Introduction and history of genetics development
2-Mendels 1st law of segregation and 2nd law of independent assortment with few definition concerning genotype, phenotype, alleles and homologous chromosomes, recessive genes and dominant genes.
3-Modes of inheritance
recessive model its characters, example of disease with their mode and different probabilities and results of their mode of inheritance
B- Dominant inheritance: its characters, example of disease with their mode and different probabilities and results of their mode of inheritance.
4-Genetics of sex determination and sex chromosome, sex linked gene with example of diseases of their mode and characters of their type of inheritance and probabilities of inheritance, sex limited gene and characters
5-Linkage: its usage in chromosomal mapping and location of genes on certain chromosomes and as a cause for deviation of certain diseases from the expected result according to Mendels 2nd law independent assortment.
6-Crossing over and the exchange of genetic material between homologous in meiosis and its importance as a natural methods in creating variation for the effect of selection.
7-Interaction between environment and genetic constitution of an individual exemplified by multifactorial inheritance.
8-Structure of chromosomes with details of the DNA structure and bases . The double helix and other unit of heredity the gene its structure and the concept of one gene to one polypeptide chain
9-Transcription and translation of the genetic code by the specificity of the base sequence .
10-Thalassemia syndrome , molecular biology of the two types of thalassemia (α and β) and its different syndrome .
11-Blood grouping ABO system , the secretor system and explantation of Bombay phenomena ., RH system and their genetic as an example of multiple alleles (locus). Determination of a character, blood groups association with disease.

1. 12-Anthropometry : human body measurement , body height , arm, span, sitting and standing height , thickness of skin fold, head circumferences and the continous variation of these

12-Unequal crossing over,