

Medical School

The Structure of the Lesson Plan

Lesson: Microbiology	Title: History and Introduction of Microbiology	Major: Pharmacy	Semester: 4	Theory / Practical: Theory
	Session: 1	Teacher: Dr.Razavi	Duration : 120 min	Number of students:
General purpose: Student familiarity with the principles of microbiological biology, introduction, history, classification of bacteria, types of microscopes and methods of studying bacteria				
Objectives: <ul style="list-style-type: none"> -Define microorganisms. - Location of the bacteria in the classification of living organisms. - Name three major differences between eukaryotes and bacteria. - Explains the importance of bacteriology in medicine. - Brief history of microbiology. - Describe the types of morphology and bacterial arrangement below the microscope. - Explain the types of microscopes and their applications in bacteriology. - A general construction of the gram-positive and negative bacteria. 		Learning area: Cognitive	Training method: Lecture by power point	
Duration	Topic of the lesson	Outline	Teaching approaches	
30 min	Location of bacteria in the classification of living organisms	-Definition of microorganism Classification of	Lecture & group discussion	

		microorganisms -Differences of eukaryotes and bacteria	
10 min	The Importance of Bacteriology in Medicine	-The role of bacteria in infectious and contagious diseases -The Role of Bacteria in Health	Lecture & group discussion
10	History of bacteriology	Familiarity with scientists and explorers in bacteriology	Lecture & group discussion
20	Familiar with a variety of microscopes and their applications in bacteriology	-Microscope and its features -Types of Optical Microscopes - Gram staining - Types of Electronic Microscopes	Lecture & group discussion
10	Classification of bacteria morphologically	-The general classification of bacteria based on the morphology -General classification of bacteria based on cellular arrangement	Lecture & group discussion
25	Structure of bacteria	-The exact structure of a bacterium -Bacterial structure components -Genetic material in bacteria -The role of ribosomes and granules in bacteria -Cytoplasmic membrane structure	Lecture & group discussion
References: Jawetz, Melnick, & Adelberg's . 2013. Medical Microbiology. 26th Ed. Medical Microbiology. 2016. P. Murray. 7 th Ed.			
Training method: Lecture by power point, Scenario, Problem-based learning ,Q & A, Group discussion			

learning assist tools : Computer, Whiteboard, Training clips , Video projector

Evaluation Method: Mid- term exam
Final exam

Medical School

The Structure of the Lesson Plan

Lesson: Microbiology	Title: Structure of bacteria	Major: Pharmacy	Semester: 4	Theory / Practical: Theory
	Session: 2	Teacher: Dr.Razavi	Duration : 120 min	Number of students:
General purpose: Student acquaintance with the exact structure of bacteria				
Objectives: <ul style="list-style-type: none">- Identify the bacterial cytoplasm components.- Explain bacterial chromosomes.- Explain the cytoplasmic membrane structure of the bacteria.-3 functions of the bacterial cytoplasmic membrane- Specify the types of active and passive transmission in bacteria.- 3 functions of cell wall- Name The components of the peptidoglycan.- Explain the difference in cell wall of gram negative and positive bacteria.- Explains the role of tychnon acid.		Learning area: Cognitive	Training method: Lecture by power point	

<ul style="list-style-type: none"> - Draw a LPS building. - Explain the biological effects of LPS. - Explain L form B bacteria. - Name The components of the spore structure. - Name the condition of the spores in bacteria. - Explain the antigen K, O, H. - Name the flagstone components. - Describe the role of the capsule in bacterial pathogenesis. -Explain Biofilm. - Specify the types of pili and their role. 			
Duration	Topic of the lesson	Outline	Teaching approaches
30	Cytoplasmic membrane	<ul style="list-style-type: none"> -Importance of membrane -membrane structure - membrane functions -material exchange - energy production 	Lecture & group discussion
40	Cell wall	<ul style="list-style-type: none"> -The Importance of Membrane-Structural Peptidoglycan-Specific structure in Gram-Positive and Negative bacteria -Structure and LPS's role in the 	Lecture & group discussion

		pathogenesis of bacteria -Bacteria without Cellular walls	
10	Spore	Spore-importance - Spore-forming bacteria –Structure of spore -Sporulation-germination -Spore classification according to location and size	Lecture & group discussion
20	Flagellas	The Importance and Structure of Flagellas	Lecture & group discussion
10	Pili	The Importance and Structure of pili	Lecture & group discussion
References: Jawetz, Melnick, & Adelberg's . 2013. Medical Microbiology. 26th Ed. Medical Microbiology. 2016. P. Murray. 7 th Ed.			
Training method: Lecture by power point, Scenario, Problem-based learning ,Q & A, Group discussion			
learning assist tools : Computer, Whiteboard, Training clips , Video projector			
Evaluation Method: Mid- term exam Final exam			

Medical School

The Structure of the Lesson Plan

Lesson: Microbiology	Title: Metabolism & growth of bacteria	Major: Pharmacy	Semester: 4	Theory / Practical: Theory
	Session: 3	Teacher: Dr.Mirkalantari	Duration : 120 min	Number of students:
General purpose: Student familiarity with the metabolism of bacteria				
<p style="text-align: center;">Objectives:</p> <ul style="list-style-type: none"> -Define metabolism and The purpose of the metabolism in bacteria. - Explain oxidation and fermentation in bacteria. - Describe the differences in glucose fermentation and oxidation metabolism. - Nutritional requirements in bacteria. - - Categorize bacteria according to the need for carbon and energy. - Environmental factors refer to bacterial growth. - Classify bacteria according to the need for oxygen. - The conditions for the growth of anaerobic bacteria. - Variety of bacterial colonies and their characteristics. - Defines Generation Time. - Explain the colony count and its importance in the medical diagnostic laboratory. - Draw the growth curve of the bacteria and describe its stages. 		<p style="text-align: center;">Learning area:</p> <p style="text-align: center;">Cognitive</p>		<p style="text-align: center;">Training method:</p> <p style="text-align: center;">Lecture by power point</p>

Duration	Topic of the lesson	Outline	Teaching approaches
30	Principles of bacterial metabolism	-Definition of Metabolism - The Purpose of Metabolism - Effective Factors in Metabolism	Lecture & group discussion
20	Synthesize of bacteria	-Synthesize bacteria - Synthesis control steps - Delicate control- harsh control – Lactose Operon	Lecture & group discussion
20	Environmental factors affecting the growth of bacteria	Direct and indirect pattern	Lecture & group discussion
30	Growth of bacteria and culture in growth media.	-Oxidative Phosphorylation - Substrate phosphorylation - Types of respiration – Producing ATP - Glucolyse- Kreb s cycle – Gly - oxalate cycle – Fermentatin and its variants	Lecture & group discussion
			Lecture & group discussion
References: Jawetz, Melnick, & Adelberg's . 2013. Medical Microbiology. 26th Ed. Medical Microbiology. 2016. P. Murray. 7 th Ed.			

Training method: Lecture by power point, Scenario, Problem-based learning ,Q & A, Group discussion
learning assist tools : Computer, Whiteboard, Training clips , Video projector
Evaluation Method: Mid- term exam Final exam

Medical School

The Structure of the Lesson Plan

Lesson: Microbiology	Title: Microorganism s genetics	Major: Pharmacy	Semester: 4	Theory / Practical: Theory
	Session: 4 & 5	Teacher: Dr.Amirmozafari	Duration : 240 min	Number of students:
General purpose: Student familiarity with genomic structure of bacteria and its fundamental difference with genome of eukaryotes. Chromosome, plasmid, prophage and a variety of gene transfer methods in bacteria.				
Objectives: -Explain the genomic structure of bacteria. - Describe the structure of chromosomes and plasmid in bacteria. - Identify genomic differences between prokaryotes and eukaryotes.	Learning area: Cognitive	Training method: Lecture by power point		

<ul style="list-style-type: none"> - Identify the factors causing phenotypic changes in bacteria. - Describe how to make mutations in bacteria. - Explains the methods of gene transfer in microorganisms. - Describe the method of transformation (natural and artificial). - Draw methods of transduction and conjugations. 			
Duration	Topic of the lesson	Outline	Teaching approaches
15	Genome difference of prokaryotes and eukaryotes -	Genome of eukaryotes Genome of Prokaryotes	Lecture & group discussion
25	The structure of the chromosomes of bacteria	Characteristics of the chromosome of bacteria And exceptions	Lecture & group discussion
20	The structure of bacterial plasmid	Similarities and differences in the structure of the plasmid with chromosomes	Lecture & group discussion
25	Reasons for making phenotypic and genotypic changes	Phenotypic changes in bacteria Genotypic changes in bacteria	Lecture & group discussion
20	Definition and causes of mutation	Definition of spontaneous and induced mutations And their reasons	Lecture & group discussion
20	Methods of gene transfer in bacteria	Importance of gene transfer for bacteria Importance of gene transfer in genetic engineering Importance of bacterial gene transfer in medicine	Lecture & group discussion
30	Transformation (natural and artificial methods)	History Importance and relevance to medicine	Lecture & group discussion

		Methods	
30	Transduction	Bacteriophages Types of bacterial infection with phages General and specific transduction	Lecture & group discussion
30	Conjugation	Sexual Pili Types of Gene Derived Cells (Male) Rolling circle Replication	Lecture & group discussion
References: Jawetz, Melnick, & Adelberg's . 2013. Medical Microbiology. 26th Ed. Medical Microbiology. 2016. P. Murray. 7 th Ed.			
Training method: Lecture by power point, Scenario, Problem-based learning ,Q & A, Group discussion			
learning assist tools : Computer, Whiteboard, Training clips , Video projector			
Evaluation Method: Mid- term exam Final exam			

Medical School

The Structure of the Lesson Plan

Lesson: Microbiology	Title: Control of microorganisms and antimicrobial compounds	Major: Pharmacy	Semester: 4	Theory / Practical: Theory
	Session: 6	Teacher: Dr.Darban	Duration : 120 min	Number of students:
General purpose: Student acquaintance with terminology and anti-microbial compounds				
Objectives:		Learning area: Cognitive	Training method: Lecture by power point	

<ol style="list-style-type: none"> 1. Classify the controlling factors of microorganisms 2. Identify all types of physical agents controlling microorganisms. 3. Name all types of chemical agents controlling microorganisms. 4. Explain other factors controlling microorganisms. 5. Define the most important terms in antibiotic therapy. 			
Duration	Topic of the lesson	Outline	Teaching approaches
20	Classification of the Controlling Factors of Microorganisms	Definition of disinfectants Classification of disinfectant agents	Lecture & group discussion
30	Investigation of various physical factors controlling microorganisms	Types of physical disinfectants	Lecture & group discussion
30	Investigation of various chemical agents controlling microorganisms	Types of chemical disinfectants	Lecture & group discussion
10	Investigating other factors controlling microorganisms	Other disinfectant	Lecture & group discussion
20	Definition of critical terminology in the field of antibiotic therapy	Wide spectrum, Limited effect bactericidal	Lecture & group discussion
References: Jawetz, Melnick, & Adelberg's . 2013. Medical Microbiology. 26th Ed. Medical Microbiology. 2016. P. Murray. 7 th Ed.			
Training method: Lecture by power point, Scenario, Problem-based learning ,Q & A, Group discussion			
learning assist tools : Computer, Whiteboard, Training clips , Video projector			
Evaluation Method: Mid- term exam Final exam			

Medical School

The Structure of the Lesson Plan

Lesson: Microbiology	Title: Antimicrobial compounds	Major: Pharmacy	Semester: 4	Theory / Practical: Theory
	Session: 7 & 8	Teacher: Dr.Darban	Duration : 120 min	Number of students:
General purpose: Student acquaintance with antibiotics affecting bacteria and resistance of bacteria to them				
Objectives: 1. Describe the types of classification of antimicrobial compounds. 2. Express antibiotics that affect the cell wall. 3. Describe the mechanism of resistance of antibiotics that affect the cell wall. 4. Name the antibiotics that affect the cytoplasmic membrane. 5. Describe the mechanism of resistance to antibiotics that affect the cytoplasmic membrane. 6. Express the antibiotics that are effective in protein synthesis. 7. Describe the mechanism of resistance to antibiotics that affect protein synthesis. 8. Explain the antibiotics that are effective in the synthesis of nucleic acids. 9. Describe the mechanism of resistance to the antibiotics that is effective in the synthesis of nucleic acid.		Learning area: Cognitive		Training method: Lecture by power point

<p>10. Name antibiotics that affect cellular metabolism. 11. Explain the mechanism of resistance to antibiotics that affect cellular metabolism. 12. Explain ways to cope with the spread of microbial resistance.</p>			
Duration	Topic of the lesson	Outline	Teaching approaches
20	Types of Classification of Antimicrobial Compounds	Classification of Antimicrobial Compounds	Lecture & group discussion
20	Evaluation of Antibiotics affecting the cell wall and its mechanisms of resistance	Beta-lactams, Cephalosporins and ...	Lecture & group discussion
30	Evaluation of antibiotics affecting the cytoplasmic membrane and its mechanisms of resistance	antibiotics affecting the cytoplasmic membrane	Lecture & group discussion
10	Evaluation of Antibiotics Effect on Protein Synthesis and its Mechanisms of Resistance	Effective on the 30s and 50s	Lecture & group discussion
20	Evaluation of antibiotics effect on nucleic acid synthesis and its mechanisms of resistance	Quinolones, fluoroquinolones and	Lecture & group discussion
20	Evaluation of antibiotics affecting cell metabolism and its mechanism of resistance	Co-trimoxazole and ...	Lecture & group discussion
20	MDRO review and ways to cope with the spread of microbial resistance	MRSA, VRE, ESBL,...	Lecture & group discussion
<p>References: Jawetz, Melnick, & Adelberg's . 2013. Medical Microbiology. 26th Ed. Medical Microbiology. 2016. P. Murray. 7th Ed.</p>			

Training method: Lecture by power point, Scenario, Problem-based learning ,Q & A, Group discussion
learning assist tools : Computer, Whiteboard, Training clips , Video projector
Evaluation Method: Mid- term exam Final exam

Medical School

The Structure of the Lesson Plan

Lesson: Microbiology	Title: Pathogenesis of bacteria and bacteria detection methods	Major: Pharmacy	Semester: 4	Theory / Practical: Theory
	Session: 9	Teacher: Dr.Mirkalantari	Duration : 120 min	Number of students:
General purpose: Students' acquaintance with the principles of how bacteria communicate with humans and how to detect bacteria				
Objectives: 1. Define symbiosis and describe its types by giving an example. 2. Description of the normal flora and its significance and its types. 3. Name The microbial flora of the important parts of the body. 4. Define concepts related to infectious diseases. 5. Explain Koch's principles and list the relevant issues. 6. Stages of pathogenesis. 7. Describe the entry and exit of bacteria from the human body with an example. 8. Identify the different factor of pathogenesis of bacteria.		Learning area: Cognitive	Training method: Lecture by power point	

<p>9. Define endotoxins and exotoxins and name their differences. 10. Identify the microbial confront with the human immune system. 11. Defines super antigen. 12. Explain immune pathogenesis. 13. Specify the types of bacterial relationships with the host cell with the example given. 14. Different stages of the bacterial and human reaction to the disease stages. 15. The relationship between the results of the microbiological lab with clinical symptoms. 16. Define re-emerging and new diseases with an example.</p>			
Duration	Topic of the lesson	Outline	Teaching approaches
10	Communicate between bacteria and humans	-Definition of symbiosis and its types	Lecture & group discussion
30	Normal flora and its importance	-Normal flora of different organs -The Importance of Normal Flora in Different Body Devices	Lecture & group discussion
20	Definitions of infections related terms	infectious disease Pathogenicity Virulence, LD50 Opportunistic infections	Lecture & group discussion
10	Determine the relationship between an infectious disease and a specific microorganisms	Koch's classic principles, the challenges of Koch's principles The molecular	Lecture & group discussion

		interpretation of Koch's principles	
10	pathogenesis	-Stages of pathogenesis - Transferring Bacteria to humans -Virulence factors of bacteria -Establishment, Invasion, and Toxin	Lecture & group discussion
20	Relationship between laboratory results and clinical symptoms	-Matching laboratory results with clinical symptoms -Adaptation of the interactions between bacteria and humans with clinical steps - re-emerging and new diseases	
References: Jawetz, Melnick, & Adelberg's . 2013. Medical Microbiology. 26th Ed. Medical Microbiology. 2016. P. Murray. 7 th Ed.			
Training method: Lecture by power point, Scenario, Problem-based learning ,Q & A, Group discussion			
learning assist tools : Computer, Whiteboard, Training clips , Video projector			
Evaluation Method: Mid- term exam Final exam			

Medical School

The Structure of the Lesson Plan

Lesson: Microbiology	Title: Staphylococci	Major: Pharmacy	Semester: 4	Theory / Practical: Theory
	Session: 10	Teacher: Dr.Talebi	Duration : 120 min	Number of students:
General purpose: Student acquaintance with history, classification of bacteria and pathogenicity, identification, prevention and treatment of Staphylococci				
Objectives: 1. Explain the history and classification of bacteria. 2. Description of the morphology, structure and genotypic characteristics of the bacteria. 3. Describe the pathogenesis and virulence factors. 4. Name the reservoir and the carrier. 5. Laboratory diagnosis (sample selection, sampling, storage and transfer of samples, biochemical tests, culture, and molecular diagnostic and drug sensitivity methods). 6. Describe the epidemiological situation. 7. Discuss the treatment and drug resistance of the bacteria. 8. The methods of bacterial control and prevention.		Learning area: Cognitive	Training method: Lecture by power point	
Duration		Topic of the lesson	Outline	Teaching approaches
10		Review the history and classification of bacteria	Definition of microorganism Classification of microorganisms	Lecture & group discussion
20		Study of morphology and structure and genotypic characteristics of bacteria	Morphology, Structure and Genome of the bacteria	Lecture & group discussion

20	Pathogenesis and virulence factors	Evaluation of virulence factors, coding genes and their role in pathogenesis of bacteria	Lecture & group discussion
10	Reservoir and carrier	Study of reservoirs and carriers of bacteria	Lecture & group discussion
10	Laboratory diagnosis (sample, sampling, storage and transfer of samples, biochemical and serological tests, culture, and molecular diagnostic and drug sensitivity methods)	Evaluation of all laboratory diagnostic methods	Lecture & group discussion
10	Epidemiological status	Prevalence of bacteria in Iran and other parts of the world	
20	Treatment and drug resistance of bacteria	Introduction of treatment methods and evaluation of resistance status	
10	Investigation of bacteria prevention and control methods	Investigating methods for preventing the prevalence of the disease	
References: Jawetz, Melnick, & Adelberg's . 2013. Medical Microbiology. 26th Ed. Medical Microbiology. 2016. P. Murray. 7 th Ed.			
Training method: Lecture by power point, Scenario, Problem-based learning ,Q & A, Group discussion			
learning assist tools : Computer, Whiteboard, Training clips , Video projector			

Evaluation Method: Mid- term exam
Final exam

Medical School

The Structure of the Lesson Plan

Lesson: Microbiology	Title: Streptococcaceae	Major: Pharmacy	Semester: 4	Theory / Practical: Theory
	Session: 11	Teacher: Dr.Talebi	Duration : 120 min	Number of students:
General purpose: Student familiarity with history, classification of bacteria and pathogenicity, identification, prevention and treatment of Streptococci				
Objectives: <ol style="list-style-type: none"> 1. Explain the history and classification of bacteria. 2. Description of the morphology, structure and genotypic characteristics of the bacteria. 3. Describe the pathogenesis and virulence factors. 4. Name the reservoir and the carrier. 5. Laboratory diagnosis (sample selection, sampling, storage and transfer of samples, biochemical tests, culture, and molecular diagnostic and drug sensitivity methods). 6. Describe the epidemiological situation. 7. Discuss the treatment and drug resistance of the bacteria. 8. The methods of bacterial control and prevention. 		Learning area: Cognitive	Training method: Lecture by power point	

Duration	Topic of the lesson	Outline	Teaching approaches
10	Review the history and classification of bacteria	Definition of microorganism Classification of microorganisms	Lecture & group discussion
20	Study of morphology and structure and genotypic characteristics of bacteria	Morphology, Structure and Genome of the bacteria	Lecture & group discussion
20	Pathogenesis and virulence factors	Evaluation of virulence factors, coding genes and their role in pathogenesis of bacteria	Lecture & group discussion
10	Reservoir and carrier	Study of reservoirs and carriers of bacteria	Lecture & group discussion
10	Laboratory diagnosis (sample, sampling, storage and transfer of samples, biochemical and serological tests, culture, and molecular diagnostic and drug sensitivity methods)	Evaluation of all laboratory diagnostic methods	Lecture & group discussion
10	Epidemiological status	Prevalence of bacteria in Iran and	Lecture & group discussion

		other parts of the world	
20	Treatment and drug resistance of bacteria	Introduction of treatment methods and evaluation of resistance status	Lecture & group discussion
10	Investigation of bacteria prevention and control methods	Investigating methods for preventing the prevalence of the disease	Lecture & group discussion
References: Jawetz, Melnick, & Adelberg's . 2013. Medical Microbiology. 26th Ed. Medical Microbiology. 2016. P. Murray. 7 th Ed.			
Training method: Lecture by power point, Scenario, Problem-based learning ,Q & A, Group discussion			
learning assist tools : Computer, Whiteboard, Training clips , Video projector			
Evaluation Method: Mid- term exam Final exam			

Medical School

The Structure of the Lesson Plan

Lesson: Microbiology	Title: Gram-negative cocci (Neisseria - Moraxella)	Major: Pharmacy	Semester: 4	Theory / Practical: Theory
	Session: 12	Teacher: Dr.Mirkalantari	Duration : 120 min	Number of students:

General purpose: Student familiarity with history, classification of bacteria and pathogenicity, identification, prevention and treatment of Gram Negative Cocci

<p align="center">Objectives:</p> <ol style="list-style-type: none"> 1. Explain the history and classification of bacteria. 2. Description of the morphology, structure and genotypic characteristics of the bacteria. 3. Describe the pathogenesis and virulence factors. 4. Name the reservoir and the carrier. 5. Laboratory diagnosis (sample selection, sampling, storage and transfer of samples, biochemical tests, culture, and molecular diagnostic and drug sensitivity methods). 6. Describe the epidemiological situation. 7. Discuss the treatment and drug resistance of the bacteria. 8. The methods of bacterial control and prevention. 	<p align="center">Learning area: Cognitive</p>	<p align="center">Training method: Lecture by power point</p>	
<p align="center">Duration</p>	<p align="center">Topic of the lesson</p>	<p align="center">Outline</p>	<p align="center">Teaching approaches</p>
<p align="center">10</p>	<p>Review the history and classification of bacteria</p>	<p>Definition of microorganism Classification of microorganisms</p>	<p>Lecture & group discussion</p>
<p align="center">20</p>	<p>Study of morphology and structure and genotypic characteristics of bacteria</p>	<p>Morphology, Structure and Genome of the bacteria</p>	<p>Lecture & group discussion</p>
<p align="center">20</p>	<p>Pathogenesis and virulence factors</p>	<p>Evaluation of virulence factors, coding genes and their role in</p>	<p>Lecture & group discussion</p>

		pathogenesis of bacteria	
10	Reservoir and carrier	Study of reservoirs and carriers of bacteria	Lecture & group discussion
10	Laboratory diagnosis (sample, sampling, storage and transfer of samples, biochemical and serological tests, culture, and molecular diagnostic and drug sensitivity methods)	Evaluation of all laboratory diagnostic methods	Lecture & group discussion
10	Epidemiological status	Prevalence of bacteria in Iran and other parts of the world	Lecture & group discussion
20	Treatment and drug resistance of bacteria	Introduction of treatment methods and evaluation of resistance status	Lecture & group discussion
10	Investigation of bacteria prevention and control methods	Investigating methods for preventing the prevalence of the disease	Lecture & group discussion

References: Jawetz, Melnick, & Adelberg's . 2013. Medical Microbiology. 26th Ed.
 Medical Microbiology. 2016. P. Murray. 7th Ed.

Training method: Lecture by power point, Scenario, Problem-based learning ,Q & A, Group discussion

learning assist tools : Computer, Whiteboard, Training clips , Video projector

Evaluation Method: Mid- term exam

Final exam

Medical School

The Structure of the Lesson Plan

Lesson: Microbiology	Title: Enterobacteriaceae	Major: Pharmacy	Semester: 4	Theory / Practical: Theory
	Session: 13 & 14	Teacher: Dr.Razavi	Duration : 120 min	Number of students:
General purpose: Student familiarity with history, classification of bacteria and pathogenicity, identification, prevention and treatment of Enterobacteriaceae				
Objectives: <ol style="list-style-type: none">1. List the location and classification of Enterobacteriaceae.2. The importance of Enterobacteriaceae3. Describe the physiology and culture of Enterobacteriaceae.4. Explains the metabolism of Enterobacteriaceae.5. Describe the antigenic building of Enterobacteriaceae.6. Explain the general principles of treatment for Enterobacteriaceae infections.7. Epidemiology of Enterobacteriaceae infections.8. List opportunistic enteric bacteria.9. Laboratory diagnosis (sample, sampling, storage and transfer of samples, biochemical and serological tests,		Learning area: Cognitive	Training method: Lecture by power point	

<p>culture, and molecular diagnostic and drug sensitivity methods).</p> <p>10. Explains the epidemiological status of Enterobacteriaceae.</p> <p>11. Explains the therapeutic and drug resistance of Enterobacteriaceae.</p> <p>12. List the methods of prevention and control of Enterobacteriaceae.</p>			
Duration	Topic of the lesson	Outline	Teaching approaches
10	Review the history and classification of Enterobacteriaceae	Definition of microorganism Classification of microorganisms	Lecture & group discussion
20	Study of morphology and structure and genotypic characteristics of Enterobacteriaceae	Morphology, Structure and Genome of the bacteria	Lecture & group discussion
20	Pathogenesis and virulence factors of Enterobacteriaceae	Evaluation of virulence factors, coding genes and their role in pathogenesis of bacteria	Lecture & group discussion
10	Reservoir and carrier of Enterobacteriaceae	Study of reservoirs and carriers of bacteria	Lecture & group discussion
10	Laboratory diagnosis (sample, sampling, storage and transfer of samples, biochemical and serological tests, culture, and molecular diagnostic and drug sensitivity methods)	Evaluation of all laboratory diagnostic methods	Lecture & group discussion
10	Epidemiological status of Enterobacteriaceae	Prevalence of bacteria in Iran and other parts of the world	Lecture & group discussion

20	Treatment and drug resistance of Enterobacteriaceae	Introduction of treatment methods and evaluation of resistance status	Lecture & group discussion
10	Investigation of Enterobacteriaceae prevention and control methods	Investigating methods for preventing the prevalence of the disease	Lecture & group discussion
References: Jawetz, Melnick, & Adelberg's . 2013. Medical Microbiology. 26th Ed. Medical Microbiology. 2016. P. Murray. 7 th Ed.			
Training method: Lecture by power point, Scenario, Problem-based learning ,Q & A, Group discussion			
learning assist tools : Computer, Whiteboard, Training clips , Video projector			
Evaluation Method: Mid- term exam Final exam			

Medical School

The Structure of the Lesson Plan

Lesson:	Title:	Major:	Semester:	Theory / Practical:
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Microbiology	Vibrionaceae ,Campylobacter, Helicobacter	Pharmacy	4	Theory
	Session: 15	Teacher: Dr.Talebi	Duration : 120 min	Number of students:
General purpose: Student familiarity with history, classification of bacteria and pathogenicity, identification, prevention and treatment of Vibrionaceae ,Campylobacter, Helicobacter				
Objectives: 1. Explain the history and classification of bacteria. 2. Description of the morphology, structure and genotypic characteristics of the bacteria. 3. Describe the pathogenesis and virulence factors. 4. Name the reservoir and the carrier. 5. Laboratory diagnosis (sample selection, sampling, storage and transfer of samples, biochemical tests, culture, and molecular diagnostic and drug sensitivity methods). 6. Describe the epidemiological situation. 7. Discuss the treatment and drug resistance of the bacteria. 8. The methods of bacterial control and prevention.		Learning area: Cognitive	Training method: Lecture by power point	
Duration		Topic of the lesson	Outline	Teaching approaches
10		Review the history and classification of bacteria	Definition of microorganism Classification of microorganisms	Lecture & group discussion
20		Study of morphology and structure and genotypic characteristics of bacteria	Morphology, Structure and Genome of the bacteria	Lecture & group discussion

20	Pathogenesis and virulence factors	Evaluation of virulence factors, coding genes and their role in pathogenesis of bacteria	Lecture & group discussion
10	Reservoir and carrier	Study of reservoirs and carriers of bacteria	Lecture & group discussion
10	Laboratory diagnosis (sample, sampling, storage and transfer of samples, biochemical and serological tests, culture, and molecular diagnostic and drug sensitivity methods)	Evaluation of all laboratory diagnostic methods	Lecture & group discussion
10	Epidemiological status	Prevalence of bacteria in Iran and other parts of the world	Lecture & group discussion
20	Treatment and drug resistance of bacteria	Introduction of treatment methods and evaluation of resistance status	Lecture & group discussion
10	Investigation of bacteria prevention and control methods	Investigating methods for preventing the prevalence of the disease	Lecture & group discussion

References: Jawetz, Melnick, & Adelberg's . 2013. Medical Microbiology. 26th Ed.

Medical Microbiology. 2016. P. Murray. 7 th Ed.
Training method: Lecture by power point, Scenario, Problem-based learning ,Q & A, Group discussion
learning assist tools : Computer, Whiteboard, Training clips , Video projector
Evaluation Method: Mid- term exam Final exam

Medical School

The Structure of the Lesson Plan

Lesson: Microbiology	Title: Heamophilus, Yersinia	Major: Pharmacy	Semester: 4	Theory / Practical: Theory
	Session: 16	Teacher: Dr.Masjedian	Duration : 120 min	Number of students:
General purpose: Student acquaintance with the structure, morphology, pathogens species, growth and metabolism, pathogenicity factors, pathogenesis, symptoms, diagnostic tests and antibiotic treatments of hemophilus and Yersinia				
Objectives: - Explain the structure, morphology, and arrangement of bacteria under the microscope. List the important species in medicine.		Learning area: Cognitive	Training method: Lecture by power point	

<ul style="list-style-type: none"> - List the common culture media for these bacteria - The method of bacterial growth, the type of metabolism, and the ways in which they produce energy. - List pathogenic factors in bacteria. - Know the symptoms of disease and pathogenesis. - Name the types of samples sent to the laboratory to detect bacteria. - Current laboratory tests for the above diseases. - Identify effective antibiotics in the treatment of diseases. 			
Duration	Topic of the lesson	Outline	Teaching approaches
10	Bacterial morphology and microscopic arrangement	Gram staining Morphology Microscopic arrangement	Lecture & group discussion
15	Important species in pathogenesis of medicine	The name of the major species causing disease in humans	Lecture & group discussion
10	Name of culture media for bacteria	Common culture media for the growth of bacteria	Lecture & group discussion
20	The type of respiratory metabolism and the way of cultivating bacteria	Metabolism used by bacteria How to culture them	Lecture & group discussion
15	Pathogenicity Agents of bacteria and pathogenesis	List of pathogenicity factors produced by	Lecture & group discussion

		bacteria Pathogenesis caused by the above factors	
10	Samples sent to laboratory	Type of medical samples provided by the patient to be sent to the laboratory	Lecture & group discussion
15	Common diagnostic tests	List of conventional diagnostic tests	Lecture & group discussion
10	Type of common antibiotic therapy	List of common antibiotics for treatment	Lecture & group discussion
References: Jawetz, Melnick, & Adelberg's . 2013. Medical Microbiology. 26th Ed. Medical Microbiology. 2016. P. Murray. 7 th Ed.			
Training method: Lecture by power point, Scenario, Problem-based learning ,Q & A, Group discussion			
learning assist tools : Computer, Whiteboard, Training clips , Video projector			
Evaluation Method: Mid- term exam Final exam			

Medical School

The Structure of the Lesson Plan

Lesson: Microbiology	Title: Clostridium	Major: Pharmacy	Semester: 4	Theory / Practical: Theory
	Session: 17	Teacher: Dr.Masjedian	Duration : 120 min	Number of students:
General purpose: Student acquaintance with the structure, morphology, pathogens species, growth and metabolism, pathogenicity factors, pathogenesis, symptoms, diagnostic tests and antibiotic treatments of Clostridium				
Objectives: <ul style="list-style-type: none"> - Explain the structure, morphology, and arrangement of bacteria under the microscope. List the important species in medicine. - List the common culture media for these bacteria - The method of bacterial growth, the type of metabolism, and the ways in which they produce energy. - List pathogenic factors in bacteria. - Know the symptoms of disease and pathogenesis. - Name the types of samples sent to the laboratory to detect bacteria. - Current laboratory tests for the above diseases. - Identify effective antibiotics in the treatment of diseases. 		Learning area: Cognitive		Training method: Lecture by power point
Duration		Topic of the lesson	Outline	Teaching approaches

10	Bacterial morphology and microscopic arrangement	Gram staining Morphology Microscopic arrangement	Lecture & group discussion
15	Important species in pathogenesis of medicine	The name of the major species causing disease in humans	Lecture & group discussion
10	Name of culture media for bacteria	Common culture media for the growth of bacteria	Lecture & group discussion
20	The type of respiratory metabolism and the way of cultivating bacteria	Metabolism used by bacteria How to culture them	Lecture & group discussion
15	Pathogenicity Agents of bacteria and pathogenesis	List of pathogenicity factors produced by bacteria Pathogenesis caused by the above factors	Lecture & group discussion
10	Samples sent to laboratory	Type of medical samples provided by the patient to be sent to the laboratory	Lecture & group discussion
15	Common diagnostic tests	List of conventional diagnostic tests	Lecture & group discussion

10	Type of common antibiotic therapy	List of common antibiotics for treatment	Lecture & group discussion
References: Jawetz, Melnick, & Adelberg's . 2013. Medical Microbiology. 26th Ed. Medical Microbiology. 2016. P. Murray. 7 th Ed.			
Training method: Lecture by power point, Scenario, Problem-based learning ,Q & A, Group discussion			
learning assist tools : Computer, Whiteboard, Training clips , Video projector			
Evaluation Method: Mid- term exam Final exam			

Medical School

The Structure of the Lesson Plan

Lesson: Microbiology	Title: Bordetella , Legionella	Major: Pharmacy	Semester: 4	Theory / Practical: Theory
	Session: 18	Teacher: Dr.Amirnozafari	Duration : 120 min	Number of students:
General purpose: Student acquaintance with the structure, morphology, pathogens species, growth and metabolism, pathogenicity factors, pathogenesis, symptoms, diagnostic tests and antibiotic treatments of Bordetella , Legionella				
Objectives:		Learning area:	Training method:	

<ul style="list-style-type: none"> - Explain the structure, morphology, and arrangement of bacteria under the microscope. List the important species in medicine. - List the common culture media for these bacteria - The method of bacterial growth, the type of metabolism, and the ways in which they produce energy. - List pathogenic factors in bacteria. - Know the symptoms of disease and pathogenesis. - Name the types of samples sent to the laboratory to detect bacteria. - Current laboratory tests for the above diseases. - Identify effective antibiotics in the treatment of diseases. 	Cognitive	Lecture by power point	
Duration	Topic of the lesson	Outline	Teaching approaches
10	Bacterial morphology and microscopic arrangement	Gram staining Morphology Microscopic arrangement	Lecture & group discussion
15	Important species in pathogenesis of medicine	The name of the major species causing disease in humans	Lecture & group discussion
10	Name of culture media for bacteria	Common culture media for the growth of bacteria	Lecture & group discussion
20	The type of respiratory metabolism and the way of cultivating bacteria	Metabolism used by bacteria How to culture them	Lecture & group discussion

15	Pathogenicity Agents of bacteria and pathogenesis	List of pathogenicity factors produced by bacteria Pathogenesis caused by the above factors	Lecture & group discussion
10	Samples sent to laboratory	Type of medical samples provided by the patient to be sent to the laboratory	Lecture & group discussion
15	Common diagnostic tests	List of conventional diagnostic tests	Lecture & group discussion
10	Type of common antibiotic therapy	List of common antibiotics for treatment	Lecture & group discussion
References: Jawetz, Melnick, & Adelberg's . 2013. Medical Microbiology. 26th Ed. Medical Microbiology. 2016. P. Murray. 7 th Ed.			
Training method: Lecture by power point, Scenario, Problem-based learning ,Q & A, Group discussion			
learning assist tools : Computer, Whiteboard, Training clips , Video projector			
Evaluation Method: Mid- term exam Final exam			

Medical School

The Structure of the Lesson Plan

Lesson: Microbiology	Title: Pseudomonas , Burkholderia , Acinetobacter	Major: Pharmacy	Semester: 4	Theory / Practical: Theory
	Session: 19	Teacher: Dr.Razavi	Duration : 120 min	Number of students:
General purpose: Student familiarity with history, classification of bacteria and pathogenicity, identification, prevention and treatment of Pseudomonas , Burkholderia , Acinetobacter				
Objectives: 1. Explain the history and classification of bacteria. 2. Description of the morphology, structure and genotypic characteristics of the bacteria. 3. Describe the pathogenesis and virulence factors. 4. Name the reservoir and the carrier. 5. Laboratory diagnosis (sample selection, sampling, storage and transfer of samples, biochemical tests, culture, and molecular diagnostic and drug sensitivity methods). 6. Describe the epidemiological situation. 7. Discuss the treatment and drug resistance of the bacteria. 8. The methods of bacterial control and prevention.		Learning area: Cognitive	Training method: Lecture by power point	
Duration		Topic of the lesson	Outline	Teaching approaches
10		Review the history and classification of bacteria	Definition of microorganism Classification of microorganisms	Lecture & group discussion
20		Study of morphology and structure and genotypic characteristics of bacteria	Morphology, Structure and Genome of the bacteria	Lecture & group discussion

20	Pathogenesis and virulence factors	Evaluation of virulence factors, coding genes and their role in pathogenesis of bacteria	Lecture & group discussion
10	Reservoir and carrier	Study of reservoirs and carriers of bacteria	Lecture & group discussion
10	Laboratory diagnosis (sample, sampling, storage and transfer of samples, biochemical and serological tests, culture, and molecular diagnostic and drug sensitivity methods)	Evaluation of all laboratory diagnostic methods	Lecture & group discussion
10	Epidemiological status	Prevalence of bacteria in Iran and other parts of the world	Lecture & group discussion
20	Treatment and drug resistance of bacteria	Introduction of treatment methods and evaluation of resistance status	Lecture & group discussion
10	Investigation of bacteria prevention and control methods	Investigating methods for preventing the prevalence of the disease	Lecture & group discussion

References: Jawetz, Melnick, & Adelberg's . 2013. Medical Microbiology. 26th Ed.

Medical Microbiology. 2016. P. Murray. 7 th Ed.
Training method: Lecture by power point, Scenario, Problem-based learning ,Q & A, Group discussion
learning assist tools : Computer, Whiteboard, Training clips , Video projector
Evaluation Method: Mid- term exam Final exam

Medical School

The Structure of the Lesson Plan

Lesson: Microbiology	Title: Aerobic, non spore forming ,gram-positive bacilli (Corynebacterium , Listeria ,Erysipelothrix, Actinomyces)	Major: Pharmacy	Semester: 4	Theory / Practical: Theory
	Session: 20	Teacher: Dr.Masjedan	Duration : 120 min	Number of students:
General purpose: Student familiarity with the history, classification of bacteria and pathogenicity, identification, prevention and treatment of Corynebacterium and Listeria				
Objectives: - Explain the structure, morphology, and arrangement of bacteria under the microscope. -List the important species in medicine. - List the common culture media for these bacteria		Learning area: Cognitive	Training method: Lecture by power point	

<ul style="list-style-type: none"> - The method of bacterial growth, the type of metabolism, and the ways in which they produce energy. - List pathogenic factors in bacteria. - Know the symptoms of disease and pathogenesis. - Name the types of samples sent to the laboratory to detect bacteria. - Current laboratory tests for the above diseases. - Identify effective antibiotics in the treatment of diseases. 			
Duration	Topic of the lesson	Outline	Teaching approaches
10	Bacterial morphology and microscopic arrangement	Gram staining Morphology Microscopic arrangement	Lecture & group discussion
15	Important species in pathogenesis of medicine	The name of the major species causing disease in humans	Lecture & group discussion
10	Name of culture media for bacteria	Common culture media for the growth of bacteria	Lecture & group discussion
20	The type of respiratory metabolism and the way of cultivating bacteria	Metabolism used by bacteria How to culture them	Lecture & group discussion
15	Pathogenicity Agents of bacteria and pathogenesis	List of pathogenicity factors produced by bacteria	Lecture & group discussion

		Pathogenesis caused by the above factors	
10	Samples sent to laboratory	Type of medical samples provided by the patient to be sent to the laboratory	Lecture & group discussion
References: Jawetz, Melnick, & Adelberg's . 2013. Medical Microbiology. 26th Ed. Medical Microbiology. 2016. P. Murray. 7 th Ed.			
Training method: Lecture by power point, Scenario, Problem-based learning ,Q & A, Group discussion			
learning assist tools : Computer, Whiteboard, Training clips , Video projector			
Evaluation Method: Mid- term exam Final exam			

Medical School

The Structure of the Lesson Plan

Lesson: Microbiology	Title: Bacillus and anaerobic gram-negative bacteria,	Major: Pharmacy	Semester: 4	Theory / Practical: Theory
	Session: 21	Teacher: Dr.Masjedan	Duration : 120 min	Number of students:

General purpose: Student familiarity with the history, classification of bacteria and pathogenicity, identification, prevention and treatment of Bacillus and anaerobic gram-negative bacteria

<p style="text-align: center;">Objectives:</p> <ul style="list-style-type: none"> - The history and discovery, classification of bacteria causing anthrax diseases, food poisoning. - Define the microorganism of the anthrax agent and food poisoning and infections. - Characterization of Bacillus anthracis and Bacillus cereus bacteria - Clinical diagnosis (pathogenicity in humans) and laboratory of Anthrax diseases, food poisoning and other related infections are briefly explained. - Treat the disease or infection caused by anthrax, food poisoning and other infections. - Epidemiology and prevention of anthrax , food poisoning and other related infections. - Characterization of Bacteroides fragilis and Fusobacterium. - Briefly explain the clinical diagnosis (pathogenicity in human) , diseases of the brain abscess , ear and oral-dental infections and other infections of Bacteroides and Fusobacterium. - Laboratory diagnosis of Bacteroides fragilis and Fusobacterium.. - Treat the disease or infections caused by the brain abscess and other ear and oral infections. - Epidemiology and prevention of diseases of the brain abscess and other ear and oral infections and other related infections. 	<p style="text-align: center;">Learning area: Cognitive</p>	<p style="text-align: center;">Training method: Lecture by power point</p>	
<p style="text-align: center;">Duration</p>	<p style="text-align: center;">Topic of the lesson</p>	<p style="text-align: center;">Outline</p>	<p style="text-align: center;">Teaching approaches</p>
<p style="text-align: center;">10</p>	<p>Bacterial morphology and microscopic arrangement</p>	<p>Gram staining Morphology</p>	<p>Lecture & group discussion</p>

		Microscopic arrangement	
15	Important species in pathogenesis of medicine	The name of the major species causing disease in humans	Lecture & group discussion
10	Name of culture media for bacteria	Common culture media for the growth of bacteria	Lecture & group discussion
20	The type of respiratory metabolism and the way of cultivating bacteria	Metabolism used by bacteria How to culture them	Lecture & group discussion
15	Pathogenicity Agents of bacteria and pathogenesis	List of pathogenicity factors produced by bacteria Pathogenesis caused by the above factors	Lecture & group discussion
10	Samples sent to laboratory	Type of medical samples provided by the patient to be sent to the laboratory	Lecture & group discussion

References: Jawetz, Melnick, & Adelberg's . 2013. Medical Microbiology. 26th Ed.
 Medical Microbiology. 2016. P. Murray. 7th Ed.

Training method: Lecture by power point, Scenario, Problem-based learning ,Q & A, Group discussion

learning assist tools : Computer, Whiteboard, Training clips , Video projector

Evaluation Method: Mid- term exam
Final exam

Medical School

The Structure of the Lesson Plan

Lesson:	Title:	Major:	Semester:	Theory / Practical:
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Microbiology	Mycobacteria	Pharmacy	4	Theory
	Session: 22	Teacher: Dr.Darban	Duration : 120 min	Number of students:
General purpose: Student acquaintance with appearance and classification of Mycobacteria, Mycobacterium tuberculosis pathogenicity, treatment and prevention				
<p>Objectives:</p> <ul style="list-style-type: none"> - Describe the appearance of mycobacteria, the cell wall structure, and the variety of culture media needed to grow. - Describe the importance of Mycobacterium tuberculosis in the development of tuberculosis with its pathogenicity mechanism. - Describe clinical findings of tuberculosis and its pathological lesions. - Describe a variety of diagnostic methods, such as acid - fast-staining, culture, immunological and molecular tests for laboratory diagnosis of Mycobacterium tuberculosis. - Describe the treatment regimens associated with tuberculosis and the problems caused by drug resistance in this bacteria. - Epidemiology of tuberculosis , transmission and prevention of the disease. -List the criteria for the classification of Mycobacteria. - Identify the important characteristics of Mycobacterium leprea and its pathogenic factors in causing leprosy. - Clinical findings of leprosy , the stages of the disease and various forms of the disease. - List diagnostic methods for leprosy. 		<p>Learning area: Cognitive</p>		<p>Training method: Lecture by power point</p>

<ul style="list-style-type: none"> - Epidemiology of leprosy, transmission and prevention of leprosy. - Important species of non- tuberculosis Mycobacteria - Describes the importance of non- tuberculosis Mycobacteria in the development of various diseases. 			
Duration	Topic of the lesson	Outline	Teaching approaches
30	History, Importance , appearance, Structure and classification of Mycobacteria	<ul style="list-style-type: none"> -History and significance of tuberculosis. -Characteristics of mycobacteria. -Cell wall. -Classification of Mycobacteria. -Culture media. 	Lecture & group discussion
20	Characteristics and pathogenicity of Mycobacterium tuberculosis	<ul style="list-style-type: none"> -Important characteristics of Mycobacterium Tuberculosis. -The pathogenicity of the Mycobacterium Tuberculosis agent. -Emerging diseases. 	Lecture & group discussion
20	Detection of latent and active tuberculosis, tuberculosis prevention and treatment	<ul style="list-style-type: none"> -Epidemiology, and transmission of tuberculosis. -Treatment and prevention of tuberculosis. 	Lecture & group discussion

		-Therapeutic protocols and challenges ahead.	
25	Mycobacterium leprea	-Important Characteristics of Mycobacterium leprea. -The pathogenicity of the TB agent. Types of leprosy. -TB laboratory diagnosis. -Epidemiology and transmission of leprosy. -Treatment and prevention of leprosy	Lecture & group discussion
20	non- tuberculosis Mycobacteria	-Major species of non-tuberculosis – Mycobacterium. -Diseases caused by these species. -Epidemiology and transmission. -Treatment and prevention of developing diseases.	Lecture & group discussion
References: Jawetz, Melnick, & Adelberg's . 2013. Medical Microbiology. 26th Ed. Medical Microbiology. 2016. P. Murray. 7 th Ed.			
Training method: Lecture by power point, Scenario, Problem-based learning ,Q & A, Group discussion			
learning assist tools : Computer, Whiteboard, Training clips , Video projector			
Evaluation Method: Mid- term exam Final exam			

Medical School

The Structure of the Lesson Plan

Lesson: Microbiology	Title: Mycoplasma, Chlamydia and Rickettsia	Major: Pharmacy	Semester: 4	Theory / Practical: Theory
	Session: 23 & 24	Teacher: Dr.Amirmozafari	Duration : 120 min	Number of students:
General purpose: Student acquaintance with the structure, morphology, pathogens, growth and metabolism, pathogenicity factors, pathogenesis, disease symptoms, diagnostic tests and antibiotic treatments of Mycoplasma, Chlamydia and Rickettsia				
Objectives: <ul style="list-style-type: none"> - Explain the structure, morphology, and arrangement of bacteria under the microscope. -List the important species in medicine. - List the common culture media for these bacteria - The method of bacterial growth, the type of metabolism, and the ways in which they produce energy. - List pathogenic factors in bacteria. - Know the symptoms of disease and pathogenesis. - Name the types of samples sent to the laboratory to detect bacteria. - Current laboratory tests for the above diseases. - Identify effective antibiotics in the treatment of diseases. 		Learning area: Cognitive	Training method: Lecture by power point	

Duration	Topic of the lesson	Outline	Teaching approaches
10	Bacterial morphology and microscopic arrangement	Gram staining Morphology Microscopic arrangement	Lecture & group discussion
15	Important species in pathogenesis of medicine	The name of the major species causing disease in humans	Lecture & group discussion
10	Name of culture media for bacteria	Common culture media for the growth of bacteria	Lecture & group discussion
20	The type of respiratory metabolism and the way of cultivating bacteria	Metabolism used by bacteria How to culture them	Lecture & group discussion
15	Pathogenicity Agents of bacteria and pathogenesis	List of pathogenicity factors produced by bacteria Pathogenesis caused by the above factors	Lecture & group discussion
10	Samples sent to laboratory	Type of medical samples provided by the patient to be	Lecture & group discussion

		sent to the laboratory	
15	Common diagnostic tests	List of conventional diagnostic tests	Lecture & group discussion
10	Type of common antibiotic therapy	List of common antibiotics for treatment	Lecture & group discussion
References: Jawetz, Melnick, & Adelberg's . 2013. Medical Microbiology. 26th Ed. Medical Microbiology. 2016. P. Murray. 7 th Ed.			
Training method: Lecture by power point, Scenario, Problem-based learning ,Q & A, Group discussion			
learning assist tools : Computer, Whiteboard, Training clips , Video projector			
Evaluation Method: Mid- term exam Final exam			

Medical School

The Structure of the Lesson Plan

Lesson: Microbiology	Title: Brucella and Francisella	Major: Pharmacy	Semester: 4	Theory / Practical: Theory
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	Session: 25	Teacher: Dr.Amirmozafari	Duration : 120 min	Number of students:
General purpose: Student acquaintance with the structure, morphology, pathogens, growth and metabolism, pathogenicity factors, pathogenesis, disease symptoms, diagnostic tests and antibiotic treatments of Brucella and Francisella				
Objectives: - Explain the structure, morphology, and arrangement of bacteria under the microscope. -List the important species in medicine. - List the common culture media for these bacteria - The method of bacterial growth, the type of metabolism, and the ways in which they produce energy. - List pathogenic factors in bacteria. - Know the symptoms of disease and pathogenesis. - Name the types of samples sent to the laboratory to detect bacteria. - Current laboratory tests for the above diseases. - Identify effective antibiotics in the treatment of diseases.		Learning area: Cognitive	Training method: Lecture by power point	
Duration		Topic of the lesson	Outline	Teaching approaches
10		Bacterial morphology	Staining Morphology	Lecture & group discussion
15		Important species in pathogenesis of medicine	The name of the major species causing disease in humans	Lecture & group discussion
20		The type of respiratory metabolism and the way of cultivating bacteria	Metabolism used by bacteria	Lecture & group discussion

		How to culture them	
15	Pathogenicity Agents of bacteria and pathogenesis	List of pathogenicity factors produced by bacteria Pathogenesis caused by the above factors	Lecture & group discussion
15	Samples sent to laboratory	Type of medical samples provided by the patient to be sent to the laboratory	Lecture & group discussion
20	Common diagnostic tests	List of conventional diagnostic tests	Lecture & group discussion
10	Type of common antibiotic therapy	List of common antibiotics for treatment	Lecture & group discussion
References: Jawetz, Melnick, & Adelberg's . 2013. Medical Microbiology. 26th Ed. Medical Microbiology. 2016. P. Murray. 7 th Ed.			
Training method: Lecture by power point, Scenario, Problem-based learning ,Q & A, Group discussion			
learning assist tools : Computer, Whiteboard, Training clips , Video projector			
Evaluation Method: Mid- term exam Final exam			

Medical School

The Structure of the Lesson Plan

Lesson: Microbiology	Title: Spirochetes	Major: Pharmacy	Semester: 4	Theory / Practical: Theory
	Session: 26	Teacher: Dr.Amirmozafari	Duration : 120 min	Number of students:
General purpose: Student acquaintance with the structure, morphology, pathogens, growth and metabolism, pathogenicity factors, pathogenesis, disease symptoms, diagnostic tests and antibiotic treatments of Spirochetes				
Objectives: <ul style="list-style-type: none"> - Explain the structure, morphology, and arrangement of bacteria under the microscope. -List the important species in medicine. - List the common culture media for these bacteria - The method of bacterial growth, the type of metabolism, and the ways in which they produce energy. - List pathogenic factors in bacteria. - Know the symptoms of disease and pathogenesis. - Name the types of samples sent to the laboratory to detect bacteria. - Current laboratory tests for the above diseases. - Identify effective antibiotics in the treatment of diseases. 		Learning area: Cognitive	Training method: Lecture by power point	
Duration		Topic of the lesson	Outline	Teaching approaches
10		Bacterial morphology and microscopic arrangement	Gram staining Morphology	Lecture & group discussion

		Microscopic arrangement	
15	Important species in pathogenesis of medicine	The name of the major species causing disease in humans	Lecture & group discussion
10	Name of culture media for bacteria	Common culture media for the growth of bacteria	Lecture & group discussion
20	The type of respiratory metabolism and the way of cultivating bacteria	Metabolism used by bacteria How to culture them	Lecture & group discussion
15	Pathogenicity Agents of bacteria and pathogenesis	List of pathogenicity factors produced by bacteria Pathogenesis caused by the above factors	Lecture & group discussion
10	Samples sent to laboratory	Type of medical samples provided by the patient to be sent to the laboratory	Lecture & group discussion
15	Common diagnostic tests	List of conventional diagnostic tests	Lecture & group discussion

10	Type of common antibiotic therapy	List of common antibiotics for treatment	Lecture & group discussion
References: Jawetz, Melnick, & Adelberg's . 2013. Medical Microbiology. 26th Ed. Medical Microbiology. 2016. P. Murray. 7 th Ed.			
Training method: Lecture by power point, Scenario, Problem-based learning ,Q & A, Group discussion			
learning assist tools : Computer, Whiteboard, Training clips , Video projector			
Evaluation Method: Mid- term exam Final exam			