



Module (Course Syllabus) Catalogue 2022-2023

College/ Institute	Shaqlawra Technical College	
Department	Medical Laboratory Technology -MLT (Morning)	
Module Name	Medical Microbiology 2 (MEI 404)	
Module Code	MEI 402	
Degree	Technical Diploma <input checked="" type="checkbox"/>	Bachelor <input checked="" type="checkbox"/>
	High Diploma <input type="checkbox"/>	Master <input type="checkbox"/> PhD <input type="checkbox"/>
Semester	4	
Qualification	Technical Diploma Student	
Scientific Title	NA	
ECTS (Credits)	5	
Module type	Prerequisite <input type="checkbox"/>	Core <input checked="" type="checkbox"/> Assist. <input type="checkbox"/>
Weekly hours	4	
Weekly hours (Theory)	(2)hr Class	(125)Total hrs Workload
Weekly hours (Practical)	(2)hr Class	(125)Total hrs Workload
Number of Weeks	14	
Lecturer (Theory)	Dr. Muayad A. Mahmud	
E-Mail & Mobile NO.	muayad.mahmud@epu.edu.iq 07504773872	
Lecturer (Practical)	Dr. Muayad A. Mahmud	
E-Mail & Mobile NO.	muayad.mahmud@epu.edu.iq	

Course Book

Course Description	<p>This course is designed to meet the requirements of students interested in careers in Medical Laboratory.</p> <p>Medical Microbiology-2 for Medical Lab technologists emphasizes on the interaction of microorganisms with humans and the diseases they cause.</p> <p>The course is complimented by laboratory exercises in which students acquire hands-on experience in studying various aspects of microbiological applications.</p>
Course objectives	<p>The main objectives of the course include:</p> <ol style="list-style-type: none"> 1- Enabling MLT students to understand disease-causing representatives of different groups of microorganisms. 2- Learning how disease causing microbes are transmitted and controlled. 3- Learning how to avoid the spread of infectious microorganisms in the hospital environment. 4- Students will learn how to use technology to access information necessary for identifying trends used in decision making, promoting quality improvement, and preserving safety, to provide patient care, collaborate with inter-professional teams, and to continuously advance the nursing profession.
Student's obligation	<p>*Exam policy:</p>

	<p>Student Should take 2 exams during the course There will be no make-up exams for absences students without medical report. Other activities such as Seminars, Reports, Lab activities and Home works are compulsory</p> <p>*Classroom polices:</p> <p>1- Attendance: students are strongly encouraged to attend class on a regular basis, as participation is important to your understanding of the material. This is your opportunity to ask questions. You are responsible for obtaining any information you miss due to absence</p> <p>2- Lateness: Lateness to class is disruptive</p> <p>3- Electronic devices: All cell phones are to be turned off at the beginning of class.</p> <p>4-Talking: During class please refrain from side conversations. These can be disruptive to students and professors.</p>																																												
Required Learning Materials	<p>Face-to-Face (Lectures and PowerPoint presentation), white-board and online meeting using Zoom us app.</p> <p>Practical lessons by working in the Lab and performing experiments. Lecture handouts will be available on Moodle plat form and online access will always be possible until final exam time.</p>																																												
Evaluation	<table border="1"> <thead> <tr> <th>Task</th> <th>Weight (Marks)</th> <th>Due Week</th> <th>Relevant Learning Outcome</th> </tr> </thead> <tbody> <tr> <td>Paper Review</td> <td></td> <td></td> <td></td> </tr> <tr> <td rowspan="6">Assignments</td> <td>Homework</td> <td>10%</td> <td></td> </tr> <tr> <td>Class Activity</td> <td>2%</td> <td></td> </tr> <tr> <td>Report</td> <td rowspan="4">14%</td> <td></td> </tr> <tr> <td>Seminar</td> <td></td> </tr> <tr> <td>Essay</td> <td></td> </tr> <tr> <td>Project</td> <td></td> </tr> <tr> <td>Quiz</td> <td>4%</td> <td></td> <td></td> </tr> <tr> <td>Lab. Report and activity</td> <td>14%</td> <td></td> <td></td> </tr> <tr> <td>Midterm Exam</td> <td>16% (T:6, P:10)</td> <td></td> <td></td> </tr> <tr> <td>Final Exam</td> <td>40% (T:15, P:25)</td> <td></td> <td></td> </tr> <tr> <td>Total</td> <td>100</td> <td></td> <td></td> </tr> </tbody> </table>	Task	Weight (Marks)	Due Week	Relevant Learning Outcome	Paper Review				Assignments	Homework	10%		Class Activity	2%		Report	14%		Seminar		Essay		Project		Quiz	4%			Lab. Report and activity	14%			Midterm Exam	16% (T:6, P:10)			Final Exam	40% (T:15, P:25)			Total	100		
	Task	Weight (Marks)	Due Week	Relevant Learning Outcome																																									
	Paper Review																																												
	Assignments	Homework	10%																																										
		Class Activity	2%																																										
		Report	14%																																										
		Seminar																																											
		Essay																																											
		Project																																											
	Quiz	4%																																											
	Lab. Report and activity	14%																																											
Midterm Exam	16% (T:6, P:10)																																												
Final Exam	40% (T:15, P:25)																																												
Total	100																																												
Specific learning outcome:	<p>Upon completion of the course, students should be able to:</p> <p>1- To demonstrate the ubiquity and diversity of microorganisms in the human body and the environment.</p>																																												

	<p>2- To illustrate the characteristics features of microorganisms and the diseases they cause.</p> <p>3- To explore mechanisms by which microorganisms cause disease.</p> <p>4- To show how the human immune system counteracts infection by specific and non- specific mechanisms.</p> <p>5- To explore the routes of transmission of infection in hospitals, communities and populations and the methods used to control the spread of infection.</p> <p>6- To demonstrate the principles of vaccine preparation and the use of vaccines in immunization.</p> <p>7- To show the reasons for, and the methods for sterilization of equipment and medical preparations from the microbiological point of view.</p> <p>8- To show the antimicrobial activity of disinfectants in the context of the patient and the environment.</p> <p>9- To illustrate the microbiological reasons for, and the importance of aseptic techniques in patient management.</p> <p>10- To demonstrate the contribution of the microbiologist and the microbiology laboratory to the diagnosis of infection including specimen collection and the role of the nurse in carrying this out.</p>	
<p>Course References:</p>	<p>Text book for theory sessions: Cowan, M. Kelly.Herzog, Jennifer, Microbiology fundamentals: a clinical approach New York, NY : McGraw-Hill (2015).</p> <p>Text book for Practical sessions: -Josephine A Morello_ Helen Eckel Mizer_ Marion E Wilson - Laboratory manual and workbook in microbiology _ applications to patient care-McGraw-Hill (2003)</p> <p>-Cappuccino James, Sherman Natalie - Microbiology. A Laboratory Manual- Pearson Education (2014)</p>	
Course topics (Theory)	Week	Learning Outcome
Introduction to Medical Microbiology 2	1	Students will be familiarized with the course syllabus and the expected learning outcomes
Quantitative Microbial Enumeration	2	Explaining the general information on the various methods used to estimate the number of microorganisms in a given sample.

Basic Biology of Fungi	3	general characteristics, classification, medical importance of major fungal groups, fungal cell structure, fungal morphology, fungal replication, general information on fungal pathogenesis.
Viral Classification, Structure, & Replication	4	basic characteristics and classification of viruses, virion structure (non-enveloped viruses, enveloped viruses), viral replication: overview, recognition & attachment to host cell, penetration.
Commensal & Pathogenic Human Microflora	5	Normal microflora of the human body, dual nature of normal flora with respect to disease, normal flora of major human body systems (respiratory tract & head, gastrointestinal tract, genitourinary system, skin).
The Gram-Positive Cocci – I	6	Staphylococcus aureus (cutaneous infections, food poisoning, endocarditis, toxic shock syndrome, etc.), Staphylococcus epidermidis (endocarditis, catheter & shunt infections, etc.), Enterococcus (urinary infections, septicemia, etc.).

The Gram-Positive Cocci – II	7	Streptococcus pyogenes (pharyngitis, impetigo, erysipelas, rheumatic fever, etc.), Streptococcus pneumoniae (pneumococcal pneumonia, otitis media, sinusitis, meningitis, etc.), Streptococcus agalactiae (neonatal diseases, other infections).
The Gram-Positive Bacilli	8	Bacillus anthracis (anthrax), Listeria monocytogenes (neonatal diseases, etc.), Corynebacterium diphtheriae (diphtheria), Clostridium perfringens (gas gangrene, food poisoning, etc.), Clostridium tetani (tetanus), Clostridium botulinum (botulism), Clostridium difficile (gastroenteritis), Erysipelothrix rhusiopathiae (erysipeloid).
The Gram-Negative Cocci & Anaerobic Bacilli	9	Neisseria gonorrhoeae (gon-orrhoea, PID, etc.), Neisseria meningitidis (meningitis, etc.), Escherichia coli (gastroenteritis), Salmonella (gastroenteritis, enteric fevers, etc.), Shigella (shigellosis), Yersinia (bubonic plague, enterocolitis), Vibrio (cholera, gastroenteritis, etc.), Campylobacter (gastroenteritis), Helico- bacter (gastritis, gastric & duodenal ulcers).
<i>Salmonella</i> (definition, characteristic, diseases, identification.....et).	10	General characteristic of <i>Salmonella spp</i> , important pathogenic species and their harms on human.
<i>Shigella</i> (definition, characteristic, diseases, identification.....et).	11	General characteristic of <i>Shigella spp</i> , important pathogenic species and their harms on human.
Bacterial Genetics – Basic Concepts & Gene Expression	12	The bacterial genome (chromosome, extrachromosomal elements, bacteriophages), gene organization (operons, cis- trons), DNA replication (binary fission, replication rules & fidelity), polymerase chain reaction.
General principles of laboratory diagnosis	13	General methods and laboratory techniques which could be used during the course

Molecular diagnosis	14	Explaining the most advanced available molecular technology for diagnosis of microbial diseases
Visit of students to diagnostic laboratories in the public and private Medical Centers.	15	Exploring the advanced diagnostic technologies are routinely used in the diagnosis of various disease causing microorganisms
Practical Topics	Week	Learning Outcome
Introduction to Medical Microbiology 2	1	Students will be familiarized with the course syllabus and the expected learning outcomes
Quantitative Microbial Enumeration	2	Explaining the general information on the various methods used to estimate the number of microorganisms in a given sample.
Basic Biology of Fungi	3	general characteristics, classification, medical importance of major fungal groups, fungal cell structure, fungal morphology, fungal replication, general information on fungal pathogenesis.
Viral Classification, Structure, & Replication	4	basic characteristics and classification of viruses, virion structure (non-enveloped viruses, enveloped viruses), viral replication: overview, recognition & attachment to host cell, penetration.
Commensal & Pathogenic Human Microflora	5	Normal microflora of the human body, dual nature of normal flora with respect to disease, normal flora of major human body systems (respiratory tract & head, gastrointestinal tract, genitourinary system, skin).
The Gram-Positive Cocci – I	6	Staphylococcus aureus (cutaneous infections, food poisoning, endocarditis, toxic shock syndrome, etc.), Staphylococcus epidermidis (endocarditis, catheter & shunt infections, etc.), Enterococcus (urinary infections, septicemia, etc.).

The Gram-Positive Cocci – II	7	Streptococcus pyogenes (pharyngitis, impetigo, erysipelas, rheumatic fever, etc.), Streptococcus pneumoniae (pneumococcal pneumonia, otitis media, sinusitis, meningitis, etc.), Streptococcus agalactiae (neonatal diseases, other infections).
The Gram-Positive Bacilli	8	Bacillus anthracis (anthrax), Listeria monocytogenes (neonatal diseases, etc.), Corynebacterium diphtheriae (diphtheria), Clostridium perfringens (gas gangrene, food poisoning, etc.), Clostridium tetani (tetanus), Clostridium botulinum (botulism), Clostridium difficile (gastroenteritis), Erysipelothrix rhusiopathiae (erysipeloid).
The Gram-Negative Cocci & Anaerobic Bacilli	9	Neisseria gonorrhoeae (gon-orrhoea, PID, etc.), Neisseria meningitidis (meningitis, etc.), Escherichia coli (gastroenteritis), Salmonella (gastroenteritis, enteric fevers, etc.), Shigella (shigellosis), Yersinia (bubonic plague, enterocolitis), Vibrio (cholera, gastroenteritis, etc.), Campylobacter (gastroenteritis), Helico- bacter (gastritis, gastric & duodenal ulcers).
<i>Salmonella</i> (definition, characteristic, diseases, identification.....et).	10	General characteristic of <i>Salmonella spp</i> , important pathogenic species and their harms on human.
<i>Shigella</i> (definition, characteristic, diseases, identification.....et).	11	General characteristic of <i>Shigella spp</i> , important pathogenic species and their harms on human.
Bacterial Genetics – Basic Concepts & Gene Expression	12	The bacterial genome (chromosome, extrachromosomal elements, bacteriophages), gene organization (operons, cis- trons), DNA replication (binary fission, replication rules & fidelity), polymerase chain reaction.
General principles of laboratory diagnosis	13	General methods and laboratory techniques which could be used during the course

Molecular diagnosis	14	Explaining the most advanced available molecular technology for diagnosis of microbial diseases
Visit of students to diagnostic laboratories in the public and private Medical Centers.	15	Exploring the advanced diagnostic technologies are routinely used in the diagnosis of various disease causing microorganisms

Question Sample:

Q/ Multiple choice question.

1. Which of the following is not considered a microorganism?

- a. algae
- b. bacterium
- c. protozoan
- d. flea

2. Microbial resistance to drugs is acquired through

- a. conjugation.
- b. transformation.
- c. transduction.
- d. all of these.

3. Which of these microorganisms is associated with Guillain-Barré syndrome?

- a. *E. coli*
- b. *Salmonella*
- c. *Campylobacter*
- d. *Shigella*

Q/ Explain questions

- 1. Differentiate between contamination, infection, and disease. What are the possible outcomes in each?
- 2. How are infectious diseases different from other diseases?

Q/ True or False type questions

- 1-The main components of cell wall of Gram positive bacteria include Peptidoglycan and Teichoic acid only
- 2-Mesosomes are Convolute invagination of cytoplasmic membrane often at sites of septum formation
- 3-Generally, well defined nucleus and nuclear membrane, discrete chromosome and mitotic apparatus are present in bacteria

Extra notes:

External Evaluator