Module (Course Syllabus) Catalogue

2022-2023

College/ Institute	Erbil Technical Medical Institute	
Department	Nursing-Morning	
Module Name	Medical Microbilogy	
Module Code	MEM213	
Semester	2	
Credits	6	
Module type	Prerequisite ✓ Core ☐ Assist. ☐	
Weekly hours		
Weekly hours (Theory)	(2)hr Class	(3)hr Workload
Weekly hours (Practical)	(2)hr Class	(0.5)hr Workload
Lecturer (Theory)	Pshtewan zaher majeed	
E-Mail & Mobile NO.	peshtewan.majeed@epu.edu.iq	
Lecturer (Practical)	Pshtewan zaher majeed	
E-Mail & Mobile NO.		

Course Book

Course Description	This course is designed to meet the requirements of students interested in careers in nursing. Clinical Microbiology for Nurses is a one-semester course that emphasizes the interaction of microorganisms with humans and the diseases they cause. Topics include microscopy, survey of various microbes, the immune system, food microbiology, microbial pathogens and mechanisms of disease transmission. The course is complimented by laboratory exercises in which students acquire hands-on experience in studying various aspects of microbiological applications.
Course objectives	The main objectives of the course include: 1- Enabling nursing 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	1- Attendance: This is mandatory and a daily official class attendance record will be maintained. 2- Tests: There will be tests and quizzes covering lectures as well as textbook reading assignments, plus a mid-term and final examination. There will be four announced tests and four unannounced quizzes per semester. 3- Laboratory exercises: Students taking this course are also to take the laboratory class. Students will be required to wear protective clothing during laboratory exercises. Laboratory reports must be typed and submitted no later than seven (7) days after completion of the exercise. 4- Assignments: There will be one assignment each before and after mid-term. No late submissions will be accepted without prior consultation and approval of the instructor. 5- Oral and poster presentations may be necessary.
Required Learning Materials	1- Materials for the laboratory will be provided by the university 2- Note books for lectures and laboratory reports. 3- Laboratory coats must be worn during laboratory exercises. 4- A hall with data-show device

	5- Handouts
Assessment scheme	16% Mid Term (Theory and practical) 4% Quiz 40% Assignment (report, paper, homework, seminar..) 25% final practical 15% final theory
Specific learning outcome:	Upon completion of the course, students should be able to: 1- To demonstrate the ubiquity and diversity of microorganisms in the human body and the environment. 2- To illustrate the characteristics features of microorganisms and the diseases they cause. 3- To explore mechanisms by which microorganisms cause disease. 4- To show how the human immune system counteracts infection by specific and non- specific mechanisms. 5- To explore the routes of transmission of infection in hospitals, communities and populations and the methods used to control the spread of infection. 6- To demonstrate the principles of vaccine preparation and the use of vaccines in immunization. 7- To show the reasons for, and the methods for sterilization of equipment and medical preparations from the microbiological point of view. 8- To show the antimicrobial activity of disinfectants in the context of the patient and the environment. 9- To illustrate the microbiological reasons for, and the importance of aseptic techniques in patient management. 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.
Course References:	**Text book for theory sessions:** Cowan, M. Kelly. Herzog, Jennifer, Microbiology fundamentals: a clinical approach New York, NY: McGraw-Hill (2015). **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) -Cappuccino James, Sherman Natalie - Microbiology. A Laboratory Manual-Pearson Education (2014)

Course topics (Theory)	Week	Learning Outcome
Introduction to Microbes and their building blocks.	February 21, 2021	Understanding what is Microbiology, their structure, microbes in history and their nomenclature
Introduction to microbial classification, growth, metabolism and genetic structure	February 28, 2021	Understanding what are bacteria, archaea, and eukaryotes. Their internal structures, nutrition and

		growth.
The structure and Infection cycle of viruses	March 7, 2021	Understanding general structure of viruses, mode of viral multiplication and techniques are used in identification of animal viruses.
Physical and Chemical Control of Microbes	March 14, 2021	Understanding medical ways of controlling infectious diseases and how to face emerging and re-emerging infectious diseases.
Antimicrobial Treatment	March 28, 2021	Understanding the principles of antimicrobial therapy, interaction between drug and microbe, antimicrobial resistance and interaction between drug and host
Interactions Between Microbes and Humans	April 4, 2021	Understanding normal biota and human host, microbial pathogenesis and infectious disease epidemiology
S2-Mid Term تاقیکردنەوەی کۆششی	**March 11, 2021**	
The Innate Immune Response	March 18, 2021	Understanding natural defence mechanisms of the host. What are the first, second and third lines of defence
The Adaptive Immune Response	March 25, 2021	Understanding the mechanisms of specific immunity and cellular responses and vaccination
Diagnosing infection	May 2, 2021	Understanding the categories of techniques used to diagnose infections such as phenotypic, genotypic and immunologic
Infectious Diseases Affecting the Skin and Eyes	May 9, 2021	Understanding the skin and its defences, normal biota of the skin, skin diseases caused by microorganisms such as measles, rubella, and small pox. etc. Eye diseases caused by microorganisms such as conjunctivitis and keratitis
Infectious Diseases Affecting the Nervous System	May 16, 2021	Understanding the nervous system and its defences, nervous system diseases caused by microorganisms such as meningitis, poliomyelitis, encephalitis … etc.
Infectious Diseases Affecting the Cardiovascular and Lymphatic Systems	May 23, 2021	Understanding the Cardiovascular and Lymphatic Systems and its defences. Diseases of Cardiovascular and Lymphatic Systems caused by microorganisms such as Malaria, HIV infection, endocarditis … etc.
(S2-Final) تاقیکردنەوەی کۆتایی	**May 30, 2021**	
Practical Topics	**Week**	**Learning Outcome**
Lab Induction	February 21, 2021	Understanding essential things in the lab such as: Safety precautions in the laboratory, Care and use of the light microscope, Principle and use of the autoclave and Writing laboratory reports.
a) Microscopy b) Hanging drop preparation	February 28, 2021	Understanding type and how to apply light microscope, preparation of specimens from suspected contamination and direct examination of samples using Hanging drop.

a) Isolation of pure cultures (streak plate; spread plate; pour plate) b) Transfer of microbial cultures (sub-culturing)	March 7, 2021	Applying isolation and identification of bacterial colony morphology and isolation of bacterial from single colony.
a) Principles of staining bacteria b) Preparation of bacterial smears c) Simple staining techniques	March 14, 2021	Applying smear preparation, staining types based on the interaction between stain components and bacterial structures as well as applying simple staining procedure.
d) Negative staining techniques a) Gram staining b) Acid fast staining a) Spore staining b) Capsule staining	March 28, 2021	Understanding principles, use and procedure of each of Gram staining, Acid fast staining, Spore staining and Capsule staining.
a) Cultivation of microorganisms b) Defined; Complex media c) Differential; Selective; Enriched; Enrichment media	April 4, 2021	Understanding types and how to use different culture media and their uses in Microbiological labs.
S2-Mid Term تاقیکردنەوەی کۆششی	**March 11, 2021**	
Physical factors affecting growth of microbes a) Temperature b) pH of medium c) Oxygen requirement	March 18, 2021	Analysing the 3 of the most important physical factors that influence the growth and survival of cells are temperature, pH, and the gaseous environment and understanding of the roles they play in cell metabolism.
a) Bacterial growth curve b) Quantitation (enumeration) of viable bacterial cells	March 25, 2021	Analysing Bacterial growth curve and methods have been devised to enumerate viable bacterial cells, including direct microscopic counts, use of an electronic cell counter such as the Coulter Counter, chemical methods for estimating cell mass or cellular constituents, turbid metric measurements for increases in cell mass, and the serial dilution–agar plate method.
a) Biochemical activities of bacteria b) Carbohydrate fermentation c) IMVIC tests d) Transformation experiment	May 2, 2021	Applying isolation and identification of microorganisms using cellular metabolism, and the biochemical transformations that occur both outside and inside the cell are governed by biological catalysts called enzymes
Cultivation of molds	May 9, 2021	Analysing molds growth on various media such as foods such as bread or citrus fruit, their shape and colour and examination with a simple lens.
a) Yeast morphology b) Identification of unknown fungi	May 16, 2021	Understanding morphology of different genera of yeast, the growth and fermentative properties of yeast cells, the sexual and asexual modes of reproduction in yeast cells and identifying unknown fungi.
Chemical agents for the control of microbial growth	May 23, 2021	Learning about the basic methods for inhibiting microbial growth and the modes of antimicrobial action, the Learning about effects of physical agents, moist heat, osmotic pressure, and

		ultraviolet radiation on selected microbial populations, the effects on selected microbial populations of chemical agents used as disinfectants, antiseptics, and antibiotics.
(S2-Final) تاقیکردنەوەی کۆتایی	May 30, 2021	

Questions Example Design

Theoretical Part:

Q1/ Write short notes about the following: **(20 Marks)**

For example: Bacterial cell wall

(The students should explain shortly the structure of the cell of bacteria, and Differentiate between gram positive and negative bacterial cell wall).

Q2/ Choose the correct answer for of the following: **(20 Marks)**

For example: 1- The scientific name of pine warm is:

a- Taenia saginata

b- Echinococcus granulosus

c- Enterobius vermicularis

d- Schistosoma mansoni

Q3/ True OR False and correct the false ones: **(20 Marks)**

For example:

1- The main structure of cell wall of gram positive bacteria is peptidoglycan. (True)

2- The parasite that causes malaria called *Toxoplasma gondii*. (False) (plasmodium)

Q4/ Match column A with column B: **(20 Marks)**

For example:

Column A		Column B	
1-	Parasite	**a.**	Bacterial growth
2-	Pelvic inflammatory disease	**b.**	*Staphylococcus aureus*
3-	True nucleus	**c.**	*Neisseria meningitis*
4-	Flagella	**d.**	Chlamydia
5-	Mesosome	**e.**	Gummatous syphilis

Column A	1	2	3	4	5
Column B					

Q5/ Enumerate the following: (20 Marks)

1. Diseases that caused by *Helicobacter pylori* are:

1- **2-**

3- **4-**

2. Sign and symptoms of enterocolitis that caused by *Campylobacter jejuni* are:

1- **2-**

3- **4-**

Practical Part:

Q1/ Write the differences between the following: (20 marks)

1-	Blood agar	**X**	Chocolate agar
2-	Simple staining	**X**	Differential staining

Q2/ Enumerate the following: (20 marks)

1- Expected pathogens that may be present in urine are:-

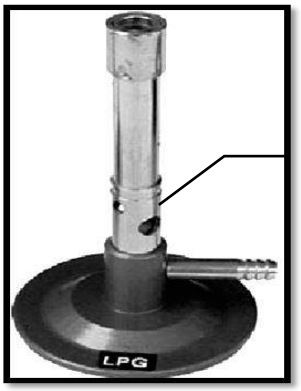
1-

2-

3-

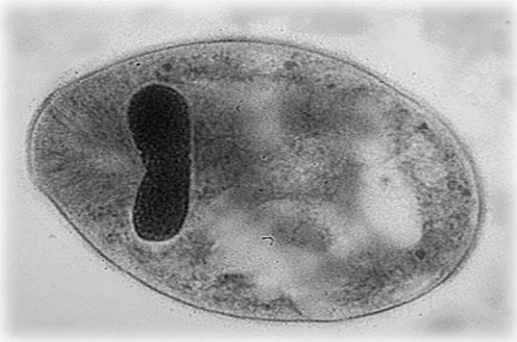
4-

Q3/ Label the following:- (20 marks)



Name:

Used for:



Stage name:
Related to the organism:
Causative agent of:
Diagnosis:
Commonly found in:

Q5/ write the procedure of the following: (20 marks)

1. Gram stain
2. Media preparation

Extra notes:
https://textbooks.opensuny.org/browse-oer/

External Evaluator

I confirmed that the contents of this syllabus are commonly more explicit and follows the principles and rules in medical microbiology subjects.

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