Module (Course Syllabus) Catalogue

2022-2023

College/ Institute	**Soran Technical college**	
Department	**Nursing Department**	
Module Name	**Medical Microbiology**	
Module Code	**MEM203**	
Degree	**Technical Diploma** [*] **Bachelor** **High Diploma** **Master** **PhD**	
Semester	**2nd**	
Credits	**6**	
Module type	**Prerequisite** **Core** [*] **Assist.**	
Weekly hours	**4**	
Number of weeks	**12**	
Weekly hours (Theory)	**(2)hrs Class**	**(162) Total hrs Workload**
Weekly hours (Practical)	**(2)hrs Class**	
Lecturer (Theory)	**Dr. Hazhar Muhammad Balaky**	
E-Mail & Mobile NO.	**hazhar.hamadameen@epu.edu.iq / 0750 4678667**	
Lecturer (Practical)	**Miss. Lida kamal**	
E-Mail & Mobile NO.	**hazhar.hamadameen@epu.edu.iq / 0750 4678667**	

Course Book

Course Description	Medical or Clinical microbiology deals with microorganisms such as pathogenic bacteria, viruses, fungi and parasites which are medically important and cause human diseases. Generally, microorganisms can cause a tremendous change on our planet and our life, there is a scientific speech says if "there is no microorganism on our earth there is no life on our planet" otherwise is also true because there are some dangerous and infectious microorganism which cause a dangerous airborne, foodborne and waterborne diseases that some of them are fatal and threaten human life. Evolution in the field of Clinical microbiology and exactly about identification of pathogenic microorganisms and the methods of chemotherapy and prophylaxes has saved the life of millions of peoples on our planet.
Course objectives	**Course objective:** The course goals are summarized below: 1. Review of historical development of microbiology 2. Recognize types of microorganisms that cause infectious diseases. 3. Interpret diagnostic methods and laboratory findings to make the ultimate diagnosis. 4. Understanding principles and methods of sterilization relative to nursing care. 5. Using microscope perfectly and demonstrate slide preparation processes. 6. Collecting clinical specimens and disposal of contaminated materials. 7. Introducing to the principles of body defense against infections.

Student's obligation	In order to succeed in Medical Microbiology, you must attend lectures, Absences affect your understanding of the material. Absences due to illness are understandable but I would appreciate if you inform the head of your department and make contacting to the department office. Regardless of the reason, you should obtain lecture notes from a fellow student or me and check with me to make sure you understand the notes.
Learning Methods & Materials	**Forms of teaching:** **Lectures** For all students in the respective course of study take place in a lecture hall. All students take the lecture together. The lecturer will give a hard copy to all students and explain the contents of lectures by making slides in power point and presenting it by a projector. **Seminars** Some time I will make groups for seminars each group will have 4-5 students depend on the number of students. Through student presentations and conversations, students' ability to dialogue with each other will promote and improve as well as to actively and critically deal with the material.
Assessment scheme	**Assessment scheme** • Attendance, seminars, quizzes and reports. • Midterm Exam. Final exam.
Student learning outcome:	**Student learning outcome:** students will learn how to: • Describe the The science of microbiology. • Discuss the Historical development of microbes and microbiology. • Describe Clarifying the main concepts of microbe classification. • Describing the main groups of Microorganisms. • Defining the science of Bacteriology, and describing the structure of bacteria • Clarifying the bacterial nutrition, physiology, and cultivation

Course References:	**Course Reading List and References:** • Kayser F.H; Beins K.A; Eckert J and Zinkernagel R.M. 2005. Medical Microbiology. Thieme Stuttgart. New Yourk • Stuart Hogg. 2005. Essential microbiology. John Wiley & Sons Ltd, The Atrium, Southern Gate, Chichester, West Sussex PO19 8SQ, England • Jawetz, Melnick, & Adelberg's Medical Microbiology. 2007. Twenty- Fourth Edition. The McGraw-Hill Companies, Inc. • Goura K. and Tim W. 2009. Clinical and Diagnostic Virology. Cambridge University Press. Cambridge, New York, Melbourne, Madrid, Cape Town, Singapore, São Paulo • William A; Harriet R; Bruce D. et al., 2001. Lippincott's Illustrated reviews: Microbiology. Lippinkot Williamsand Wilkins. USA.

Workload and Grading

Student workload/week	Hours	Student workload/Semester	Hours
Theoretical lecture	2	Total workload hours/12 weeks	156
Lecture preparations	2	Project	0
Practical lecture	2	Workshop	0
Review and quizzes	2	Award	0
Seminar	2	Preparations for Midterm exam	2
Report	1	Preparations for final exam	4
Presence	2		0
Social activity	0		0
other activities	0		0
Total hours/week	13	Total workload hours/Semester	162
Total hours/12 weeks	**156**	**Credit (ECTS)**	**6**

Workload

Grading

Workload	Grading/100
Theoretical lecture	**10**
Lecture preparations	**0**
Practical lecture	**15**
Review and quizzes	**8**
Seminar and report	**10**
Lab report	**10**
Presence	**2**

Homework	5
Preparations for Midterm exam	25
Preparations for final exam	40
Semester Grades	**60**
Final Exam	**40**
Overall Grades	**100**

Course topics (Theory) 2 hrs/week	Topic description/ Topic objectives
Introduction to microbiology	Making students familiar to the microbes, microbiology; and microbial historical development.
Microbiology branches	Making students familiar to the branches of microbiology.
Cell structure and organization	Making students familiar to the bacteria, bacterial structure and bacterial morphology.
Microbial nutrition and growth	Describing the term of micronutrient, macronutrient. Making student to be familiar with factors that have effect on bacterial growth.
Control of microorganisms	1. Describing the term of sterilization and contamination 2. Making students more familiar for sterilization methods and the effect of disinfectants.

	3. Controlling the sources of contamination
Gram stain and Staphylococci	1. Clarifying the basic concepts of Gram staining, and its importance in bacteriology and bacterial identification. 2. Making students familiar with Gram staining and Staphylococci
Streptococci	Identifying the basic properties of *Streptococci*, and teaching the students how to distinguish Staphylococci from Streptococci.
Neisseria	Introducing the students Gram negative cocci including Gonococcal and meningococcal bacteria and their medical importance in human life.
Tuberculosis and Mycobacteria	The meaning of tuberculosis, its clinical and lab. Symptoms, diagnosis and treatment.
Seminar	
Gram positive bacilli *Corynebacteria* and *Bacilli*	1. General characters of Gram negative bacilli (***Corynebacteria*****)** 2. Diphtheria; infections, diagnosis, and treatment. 3. Anthrax; pathogenesis; infections, diagnosis, and treatment. 4. Infections due to other *Bacillus spp*.
Viruses and some important viral infections	1. Viruses and their structure. 2. General properties of viruses. 3. Replication cycle of viruses. **Important viral infections** 1. Influenza. 2. HIV 3. Hepatitis 4. Others

Medical Mycology	• *Introduction to mycology.* • *Mycotic infection.*
Final Exam	

Coursework and exams

Examinations:

Q1/ Write (T) for true and (F) for false ones and correct the false answers.

1. The cell wall of Gram negative bacteria contains a thicker lipid layer than that of Gram positive.
2. The period in which the bacteria able to increase their number exponentially called lag phase.

Answers of Q1:1. (T)

2. (F) the period is called Log phase.

Q2/ Choose the correct answer for the followings.

1. *S. aureus* is a ..... bacteria.

a. Coagulase producing gram negative b. Non-coagulase producing Gram positive c. Coagulase producing Gram positive

2. The ability of a bacterium to case infections said to be a .....

a. Infection b. Pathogenic c. Nonpathogenic d. Virulence factor

Answers of Q2: 1. C 2. B

Q3/ Answer the followings:

Define sterilization. Enumerate the methods of sterilization, which method is used to sterile an enzyme solution? Why?

Answers of Q3 (B):Sterilization: Is the process of removing all microbial agents form a sample or a

specimen using different methods including heat, radiation, chemicals....

Methods:

1. **Heat: b. Steam: usually use for sterilizing media, ...**
2. **Radiation: Different types of radiation can be use for sterilization such as surgical rooms.....**
3. **Filtration: Millipore filter paper can be use especially for liquids protein materials.....**
4. **Different chemical: such as alcohol, different surface disinfectants.....Filteration method is used for sterilizing of enzymes.....**

Q4/ Explain why?

1. Some bacteria able to cause food poisoning.

2. Viruses are obligate intracellular parasites.

Answer of Q4:

1. Because these types of bacteria are able to produce different types of toxins (they are toxigenic) which can easily cause food poisoning when swallowed.
2. Because viruses lack cellular organelles and have no necessary enzymes and completely depend on their hosts for their replication.

Q5/ Answer the following:

A. Define virulence factors and then enumerate in points the main virulence factors produced by S. aureus.

B. Enumerate in points three advantage and three disadvantages of bacteria to human.

Answers of Q5:

A.

Virulence factors: Is a substance that, when purified to homogeneity and introduced into a test animal,

produces a pathogenic effect. **Or** can be defining: as (**any factor produced by a bacterium that is not essential (or useful) for growth, but allows survival within or on a host organism in a non-symbiotic manner would be considered a virulence factor.** The main virulence factors produce by S aureus are summarized in below:

1. Coagulase enzymes which is able to cause agglutination of plasma.
2. Alpha toxin (Phospholipase C).
3. Enterotoxins.
4. Different Haemolysins
5. Leukocidin

B.

The bacteria are described to be both harmful and useful. The following are three useful and three harmful characters of bacteria in general:

- Bacteria advantages:

1. Production of some useful materials such as proteins and enzymes.
2. Using of some bacteria in the diary product production.
3. Some bacteria are very useful for making soil fertilization.

- Bacteria disadvantages:

1. The vast majority of bacteria can cause different disease and infections to human.
2. Can cause food spoilage.
3. Can cause problems to the agriculture and plant disease.

Extra Notes

1. Attend every single class.
2. If you don't understand something, do not hesitate to ask your teacher.
3. Do your homework properly.
4. Study very hard, and be happy.

Wish you all, all the best

Peer review