Faculty: Faculty of Allied Medical Sciences	
Department: Medical laboratory science	Program: MSC Medical laboratory
Semester: Second	Academic year: 2022/2023

Course Plan

First: Course Information

Course Number: 0701703	Course Name: Advanced Diagnostic Microbiology	Credit Hours:3
Prerequisite:	*Section Number: 1*	*Lecture Time:* 12:00-9:00 *Saturday*
Type Of Course::	☐*bligatory Faculty Requirement* ☐*Obligatory Requirements* ☐*aculties Obligatory Requirements* ■*Department Obligatory Requirements* ☐*epartment Elective Requirements Supporting Specialization Requirements*	
Type of Learning:	■ully Direct(Fully Face-to-Face Education) ☐lended Learning (2 Face-to-Face + 1Asynchronous) ☐ully Electronic Education(2 Synchronous + 1 Asynchronous)	

Second: lecturer's Information

Name: Dr.Ayman Alsheikh	*Academic Rank : Assistant Professor*	
Office Number: 368D	*Telephone Ext:1803*	*Email:asheikh@zu.edu.jo*
Office Hours:	*Sunday Monday Tuesday Thursday 11:00-12:00 pm*	

Third: Brief Description of the Course

Principles of clinical microbiology with emphasis on pathogenic characteristics, isolation, and identification of bacteria and viruses related to human disease. The course focuses on the theoretical approach to the current diagnostic techniques and identification systems used in clinical practice. Various topics, including disease causation, specimen collection and handling, laboratory identification and treatment of medically significant bacteria and viruses will be discussed.

Fourth: Learning Sources

Textbook:	• Jawetz Medical Microbiology, 26rd Edition. Edited by Geo.F. Brooks & others. A Lange Medical Book, 2013. • Willey M. Joanne, Sherwood M. Linda, and Woolverton J. Christopher. Prescott Microbiology. 8th edition. McGraw Hill, 2011. • Samuel Baron. Medical Microbiology, latest edition. University of Texas Medical Branch at Galveston, Galveston, Texas, latest edition • Bailey & Scott's Diagnostic Microbiology, 13th edition. Edited by Betty A. Forbes, Daniel F. Sahm, Alice S. Weissfeld. Mosby,Elsevier Inc., 2013 Http://evolve.elsevier.com/Forbes.
References	**University Library:** the library in the university provides excellent electronic resources anddatabases that include research papers and book chapters. Please visit the university website/library page for more information.
Teaching Type:	■ *Classroo*□ *Laboratory*□ *Workshop*MS □Teams■ Moodle

Fifth: Learning Outcomes

Course Learning Outcomes		*Program Learning Outcome Code*
Code	Knowledge	
K2	**Contemporary Trends, Problems and Research:** The course will give the student the opportunity to practice all laboratory procedures according to quality control standards.	P.K2
K3	**Professional Responsibility:** • There are different practical activities that student can learn through the course and enrich his knowledge in different methods widely used in identification of microorganisms and methods used for testing sensitivity to antimicrobial substances. • 2- The student will deal with qualitative and quantitative estimation of microorganisms, and this may be of interest due to the need to assure the quality of different pharmaceutical products	P.K3
Skills		
*S1	• State the recent advances in the field of	**P.S1

	laboratory diagnosis of infectious diseases. • Concentrate on certain infectious agents associated with respiratory, genitourinary, gastrointestinal, cardiovascular, neurosciences, musculoskeletal system.	
S2	**Modelingand Design:** • To become familiar at formulating hypotheses in related fields of medical and diagnostic microbiology through analyzing selected hematology cases and reading scientific papers in related field	P.S2
S3	**ApplicationofMethodsandTools:** • Understand different methods used in diagnostic microbiology and their applications in scientific research and medical analysis • To become familiar in applying the knowledge of different tools and techniques in hematology in medical laboratory analysis	P.S3
Competences (Transferable skill and attributes)		
C1	• Analytic skills:The student will be able to recognize and diagnose common infectious diseases from the clinical presentation and microbiological lab findings. • Ability to extract data and analyze data from scientific research paper related to the course.	
C2	Strategic Thinking: • To be able to put the knowledge from this course into larger contexts of how toapply modern laboratory procedures and techniques in hematology into medical laboratory field and the diagnosis of diseases	
C3	Creative thinking and innovation: Use a wide range of idea based on their knowledge	

	in this course to suggest research method related to hematology and apply that on different medical analysisfields	

*K: knowledge, S: skills, C: competencies.

** P.K:Program Learning Outcome Knowledge, P.S:Program Learning Outcome Skill, P.C: Program Learning Outcome Competence.

Sixth: Course Structure

Lecture Date	Learning Outcome	Topic(s)	Learning *Procedures	***TeachingMethods	References***
11/03/2023	K, S, C	**Bacterial Pathogenesis** • General Concepts • Pathogenic Mechanisms • bacteria infectivity • Host resistance • Genetic and molecular basis of virulence • Host mediated pathogenesis • Intracellular growth • Specific virulence factors	Direct	Power point lecture	
18/03/2023	K, S, C	**Colonization and Invasion by Bacterial Pathogens** • Mechanisms of Adherence to Cell or Tissue Surfaces • Specific Bacterial Adhesins and their Receptors • Mechanisms of invasion • Enzymes and spreading factors	Direct	Power point lecture	

25/03/2023	K, S, C	• Overcoming Host Phagocytic Defenses • Products of Bacteria that Kill or Damage Phagocytes • Evading Complement • Avoiding Host Immunological Responses • Immunological Tolerance to a Bacterial Antigen • Antigenic Disguise • Immunosuppression • Induction of Ineffective Antibody • Antigenic Variation	Direct	Power point lecture	
01/04/2023	K, S, C	**Bacterial Structure in Relationship to Pathogenicity** • The Importance of the Bacterial Surface components • Classification of structuresrelated to the pathogenicity	Direct	Power point lecture	
08/04/2023	K, S, C	**Endotoxin and Exotoxins** • Chemical nature of endotoxin • Biological activity • LPS and virulence of gram -negative bacteria • Detection of endotoxins in medical solution • Classification and Biological activity of exotoxins • A + B Subunit	Direct	Power point lecture	

		Arrangement of Protein Toxins • Attachment and Entry of Toxins • Pathogenicity Islands • Siderophores			
15/04/2023	K, S, C	**Principles of Diagnosis: Traditional Cultivation andIdentification** • Manifestations of Infection • Specimen Selection, Collection and Processing • Microbiologic Examination • Principles of Bacterial Cultivation • Principles of Identification • Principles of Phenotype-BasedIdentification Schemes • Commercial Identification Systems • Classification Below and Above the Species Level • Designation of New Species and Nomenclatural Changes • Assessing Newly Described Bacteria • Chromatography	Direct	Power point lecture	
22/04/2023	K, S, C	**Nucleic Acid–Based Analytic** • Methods for Microbial	Direct	Power point lecture	

		Identification and Characterization • Overview of Molecular Methods			
29/04/2023	K, S, C	**Immunochemical Methods Used for Organism Detection** • Production of Antibodies for Use in Laboratory Testing • Principles of Immunochemical Methods Used for Organism Detection • Serologic Diagnosis of Infectious Diseases • Features of the Immune Response • Serodiagnosis of Infectious Diseases • Principles of Serologic Test Methods	Direct	Power point lecture	
06/05/2023	K, S, C	**Diagnostic Medical Microbiology and Clinical Correlation** • Principles of Diagnostic Medical Microbiology • Communication Between Physician and Laboratory • Diagnosis of Bacterial and viral Infections • Diagnosis of Infection by Anatomic Site • Anaerobic Infections • Diagnosis of Chlamydial Infections • Diagnosis of Viral Infections	Direct	Power point lecture	

13/05/2023	K, S, C	**Introduction to infectious disease** **Blood borne pathogens** • Describe certain blood borne pathogens with emphasis on morphological characterization, pathogenesis, clinical manifestation, immunology, prevention, and laboratory diagnosis.	Direct	Power point lecture	
20/05/2023	K, S, C	**Infection of gastrointestinal tract** • Describe certain pathogens associated with GIT, with emphasis on morphological characterization, pathogenesis, clinical appearance, immunology, and laboratory diagnosis	Direct	Power point lecture	
27/05/2023	K, S, C	**Pathogens associated with nervous system** • Describe certain pathogens associated with CNS, with emphasis on morphological characterization, pathogenesis, clinical appearance, and laboratory diagnosis.	Direct	Power point lecture	
03/06/2023	K, S, C	**Skin and nails pathogens** • Describe certain pathogens associated with skin and mucus membrane, with emphasis on morphological characterization, pathogenesis, clinical appearance, immunology, and	Direct	Power point lecture	

		laboratory diagnosis			
03/06/2023	K, S, C	**Genitourinary tract infection** • Describe certain pathogens associated with GUT, with emphasis on	Direct	Power point lecture	
10/06/2023	K,S,C	**Respiratory system** • Describe certain pathogens associated with RT, with emphasis on morphological characterization, pathogenesis, clinical appearance, immunology and laboratory diagnosis	Direct	Power point lecture	

Learning procedures: (Direct, synchronous, asynchronous). * * Teaching methods: Lecture, video…..). * * Reference: Pages of the book, recorded lecture, video….).

Seventh: Assessment methods

Methods	Fully Electronic Education	Blended Learning	Direct Teaching	The course outcomes that are measured measured
First Exam	0	0	20	
Second Exam	0	0	20	
Mid-term Exam	35	35	0	
Participation	0	5	10	
Asynchronous Meetings	15	10	0	
Final Exam	50	50	50	

Eighth: Course Polices

Course policies are applied in all types of education (electronic learning, blended learning, & face-to-face learning) as follows:

- Meeting the deadline for the lecture.
- Commitment to interaction and participation.
- University regulations for attendance and absence from lectures and examinations are in force.
- Academic Integrity: Fraud or moral impersonation are unacceptable and are punishable according to university regulations and instructions.
- Interactive lectures will be given through a platform (MS Teams).
- Assignments and Quizzes will be given through a platform (Moodle).
- Commitment to the right appearance in front of the camera with the proper background.
- Exams will be given face-to-face on campus.

Approval	Name	Date	Signature
Head of Department	dr. kawther Amawi		
Faculty Dean			