Course Syllabus

1	**Course title**	Diagnostic Microbiology
2	**Course number**	0308352
3	**Credit hours**	3 hrs
	Contact hours (theory, practical)	(2 theory, 3 practical)/ week
4	**Prerequisites/co-requisites**	General Microbiology
5	**Program title**	Clinical Laboratory Sciences
6	**Program code**	0308
7	**Awarding institution**	University of Jordan
8	**School**	Science
9	**Department**	Department of Clinical Laboratory Sciences
10	**Course level**	Third Year
11	**Year of study and semester (s)**	2nd Semester 2023/ 2024
12	**Other department (s) involved in teaching the course**	BSc
13	**Main teaching language**	English
14	**Delivery method**	■Face to face learning
15	**Online platforms(s)**	☐ Moodle ☐ Microsoft Teams ☐Skype ☐Zoom ☐Others……
16	**Issuing/Revision Date**	22nd Feb 2024

17 Course Coordinator:

Name: Dr. Suzan Matar
Contact hours: Sun 11:30-12:30: Mon 12:30-1:30: Tue 10:30-11:30
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18 Other instructors:

Name:

Office number:

Phone number:

Email:

Contact hours:

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19 Course Description:

This is a diagnostic microbiology course intended for students studying at the department of Clinical Laboratory Sciences. The course is a comprehensive study of microorganisms of importance in human health and disease. Topics include collection and processing of clinical specimens, isolation and identification of pathogens, with a focus on colonial, microscopic, biochemical and molecular characteristics, and interrelationships of microorganisms and human hosts and prevention and control of infectious diseases. Students acquire an understanding of the physiological and virulence properties of microorganisms and epidemiological factors contributing to human infectious disease; and an introduction to the activities and uses of antimicrobial agents for asepsis and treatment.

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20 Course aims and outcomes:

A- Aims

This is a diagnostic microbiology course intended for students studying at the department of Clinical Laboratory Sciences.

The course (Lectures and laboratory sessions) will concentrate on the detection and identification of infectious agents in the clinical laboratory, followed by determination of susceptibility to antimicrobial agents. The course will cover general principles of infectious diseases and laboratory diagnosis. The largest section will consist of extensive discussion of groups of infectious agents (bacterial) and the diseases that they produce.

B- **Students Learning Outcomes (SLOs):**

For purposes of mapping the course SLOs to the Clinical Laboratory Sciences program SLOs, at the successful completion of the program, graduates are expected to be able to:

SLO(1). Understand and apply the theoretical foundations of medical laboratory sciences to accurately calibrate and operate advanced laboratory equipment.

SLO(2). Demonstrate knowledge of safety protocols, Ministry of Health regulations, and environmental preservation practices when handling samples of pathogens and chemical/biological risks.

SLO(3). Acquire in-depth technical knowledge to stay abreast of scientific advancements and actively participate in local and global applied research in the field.

SLO(4). Perform diverse analyses and effectively interpret results for various clinical samples across laboratory disciplines such as hematology, clinical chemistry, microbiology, urine analysis, body fluids, molecular diagnostics, and immunology.

SLO(5). Apply practical training to solve complex problems, troubleshoot issues, and interpret results, ensuring a connection between data and specific medical conditions for precise diagnosis.

SLO(6). Show effective communication skills to convey information accurately and appropriately in a laboratory setting.

SLO(7). Demonstrate a commitment to lifelong learning and innovation by applying modern techniques, critically analyzing information, and contributing to the creation and application of new knowledge in medical laboratory sciences which fulfil the requirements of national and international CBD.

SLO(8). Uphold professional behavior, ensuring the confidentiality of client information, and respecting client privacy throughout all aspects of laboratory work.

SLO(9). Apply managerial skills that align with quality assurance, accreditation, quality improvement, laboratory education, and resource management, showcasing competence in the effective administration of laboratory practices.

Descriptors	ILO/ID	Program SLOs / Course SLOs	SLO (1)	SLO (2)	SLO (4)	SLO (5)	SLO (6)
Knowledge	A1	Define key terms related to microbiology and diagnostic techniques	X				
	A2	Identify different types of microorganisms and their characteristics.	X				
	A3	Explain the mechanisms of antimicrobial resistance and its implications for diagnostic microbiology.			X		
Skills	B1	Apply proper techniques for specimen collection, transport, and processing.		X			
	B2	Utilize laboratory equipment to perform diagnostic tests accurately.	X				
	B3	Interpret laboratory results accurately and troubleshoot common issues encountered in diagnostic microbiology.			X		
Competence	C1	Analyze clinical case scenarios to determine appropriate diagnostic approaches and treatment strategies					X
	C2	Communicate laboratory findings clearly and professionally through written reports				X	

21. Topic Outline and Schedule:

Week	Lecture	Topic	Student Learning Outcome	Learning Methods (Face to Face/Blended/ Fully Online)	Platform	Synchronous / Asynchronous Lecturing	Evaluation Methods	Resources
1	1.1	Microbes and the Science of Microbiology	A1	Face to Face	Lecture Room	Synchronous	Quiz, Exam	Ch 1
	1.2	Pathogen Risk Groups and Laboratory Biosafety Levels (BLS)	B1	Face to Face	Lecture Room	Synchronous	Quiz, Exam	Ch 2 + Ch5
2	2.1	Understanding Infectious Diseases	A1	Face to Face	Lecture Room	Synchronous	Quiz, Exam	Ch 2
	2.2	Emerging Infectious Disease (EID)	A1, A2, B3	Face to Face	Lecture Room	Synchronous	Quiz, Exam	Ch 7
3	3.1	Combating Pathogens and Infectious Diseases	A3	Face to Face	Lecture Room	Synchronous	Quiz, Exam	Ch 3
	3.2	Workplace Immunization	A3	Face to Face	Lecture Room	Synchronous	Quiz, Exam	Ch 3

4	4.1 4.2	Clinical Specimens Used for the Diagnosis of Infectious Diseases	B1	Face to Face	Lecture Room	Synchronous	Quiz, Exam	Ch5
5	5.1 5.2	Laboratory methods and strategies in susceptibility testing	A1, A3, B2, B3	Face to Face	Lecture Room	Synchronous	Quiz, Exam	Ch12: Bailey & Scott's diagnostic microbiology
6	6.1 6.2	Gram-Positive Cocci	A2, C1,2	Face to Face	Lecture Room	Synchronous	Quiz, Exam	Ch 10
7	7.1 7.2	Gram-Positive and Acid-Fast Bacilli	A2, C1,2	Face to Face	Lecture Room	Synchronous	Quiz, Exam	Ch 11
8	8.1	Bioterrorism – Bacillus anthracis	A2, C1,2	Face to Face	Lecture Room	Synchronous	Quiz, Exam	Ch 11
9	9.1 9.2	Gram-Negative Cocci and Related Bacteria	A2, C1,2	Face to Face	Lecture Room	Synchronous	Quiz, Exam	Ch12
10	10.1 10.2	Gram-Negative Bacilli: The Family Enterobacteriaceae	A2, C1,2	Face to Face	Lecture Room	Synchronous	Quiz, Exam	Ch 13
11	11.1 11.2	Fastidious and Miscellaneous Gram-Negative Bacilli	A2, C1,2	Face to Face	Lecture Room	Synchronous	Quiz, Exam	Ch14
12	12.1 12.2	Curved and Spiral-Shaped Bacilli	A2, C1,2	Face to Face	Lecture Room	Synchronous	Quiz, Exam	Ch 15
13	13.1 13.2	Obligate Intracellular Bacteria	A2, C1,2	Face to Face	Lecture Room	Synchronous	Quiz, Exam	Ch 16
14	14.1 14.2	Anaerobic Bacteria	A2, C1,2	Face to Face	Lecture Room	Synchronous	Quiz, Exam	Ch 17

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22 Evaluation Methods:

Opportunities to demonstrate achievement of the SLOs are provided through the following assessment methods and requirements:

Evaluation Activity	Mark	Topic(s)	SLOs	Period (Week)	Platform
Assignments and Lab reports	5			Every 4 weeks	
Quizzes	5			Every 3 weeks	On campus
Lab Exam	20	All topics in Lab curriculum	All SLOs	Week 15	On campus Computerized
Second Exam or (Mid Exam)	20	1-7		Week 8	On campus
Final Exam	50	All Topics	All SLOs	Week 16	On campus

23 Course Requirements

Student are **required** to have access to the following:
- A computer (with webcam & microphone)
- Active and dependable internet connection
- E-Learning website (not the mobile application) works smoothly on their computer.
- Make sure to install the application (platform) which will be used by your instructor to conduct the live meetings (Microsoft Teams).

24 Course Policies:

A- Attendance policies:

- Attend and participate in all classes: attendance will be taken.

Class time will be used to discuss, elaborate, expand, etc., on the written modules. This may include formal/informal lectures, audio visual presentations, demonstrations, labs, etc.

B- Absences from exams and handing in assignments on time:

1. A student who has been absent for 15% or more of the total hours of any course, including absences for medical or compassionate reasons, may be required to withdraw from that particular course.
2. Students who miss quizzes or examinations will automatically be assigned a mark of zero unless the respective instructor, or the Program Head, has been notified of the reason for absence *PRIOR* to the commencement of the exam. Acceptable reasons will be evaluated at the time (e.g., illness - medical certificate may be required, serious illness or death in the family, etc.). Supplemental examinations may be allowed in legitimate cases.

C- Health and safety procedures:

All students need to be immunized against hepatitis B, immunization certificate must be forwarded to the coordinator of the hospital training. Pregnancy affects immunization and it is the responsibility of the student to notify the health person as soon as possible of her pregnancy. If there are fees related to immunization, it is the responsibility of the student.

D- Honesty policy regarding cheating, plagiarism, misbehavior:

E- Grading policy:

Evaluation	Point %	Date
Assignments or Quizzes and Lab reports	15%	
Lab Exam	20%	
Midterm Exam	20%	Will be announced in due time.
Final Exam	50%	Will be announced in due time.

F- **Available university services that support achievement in the course:**

1. Microbiology Lab
2. The University Computer Lab.
3. The University Main Library.
4. The University e-library.

25 References:

A- Required book(s), assigned reading and audio-visuals:

A- Required book (s), assigned reading and audio-visuals:

1. Laboratory diagnosis of infectious diseases : essentials of diagnostic microbiology / Paul G. Engelkirk, Janet Duben-Engelkirk.

2. Tille, P. M., & Forbes, B. A. (2014). Bailey & Scott's diagnostic microbiology (Thirteenth edition.). St. Louis, Missouri: Elsevier.

B- Recommended books, materials, and media:

1. Jawetz, Melnick, & Adelberg's Medical Microbiology, 25th Edition, By Geo. F. Brooks, Karen C. Carroll, Janet S. Butel, Stephen A. Morse.

2. A CLASSROOM FACEBOOK PAGE: Medical Microbiology and Immunology/CLS

https://www.facebook.com/groups/517160391789023/?ref=bookmarks

3. Access UJ E-learning portal for the course power point lectures and other supplements

26 Additional information: Laboratory Curriculum

Week	Topic	Description
1	Introduction to Diagnostic Bacteriology Biomedical Waste Management Potential Lab Hazards Biosafety practices Disinfection and waste management	- Laboratory Safety Procedures - Specimen-Sampling £ Collection - Culture Media Preparation £ Sterilization
2	Aseptic Technique £ Transfer Of Microorganisms Staining	- Aseptic Technique - The Streak-Plate Technique - Forms of Culture Medium - Colony Morphology and Pigmentation - Gram and Acid Fast Stain
3.	Identification of Gram Positive Cocci (1)	- *Staphylococcus aureus,* - *S. epidermidis* - *S. saprophyticus*
4.	Identification of Gram Positive Cocci (2)	- Beta Streptococci (Groups A,B,C,F,G) - Pneumococcus (*Streptococcus pneumoniae*) - Viridans Streptococci - Enterococci
5.	Aerobic £ Anaerobic Endospore-Forming Bacteria Isolation Of Normal Microbiota From Human Body	- *Bacillus £ Corynebacteriae* - Common microbiota of the nose and throat
6.	Identification Of Gram-Negative Cocci And Coccobacilli	- *Neisseriae* - *Hemophilus*
7.	Identification of Enterobacteriaceae Gram-Negative bacilli	- Fermentative, Enteric Bacilli
8.	Identification of Pseudomonas and Acinetobacter Gram-Negative bacilli	- Non-fermentative, Gram-Negative Bacilli
9.	Isolation Of Normal Microbiota From Human Body A. Urine Culture B. Stool Culture	- Common microbiota of Urine and Stool - Qualitative Urine Culture - Screening for *Salmonella* carriers
10.	Using Antimicrobial Chemotherapeutic Agents To Control Microorganisms	- Antibiotic Susceptibility Testing Kirby-Bauer Assay (Disk Diffusion) Tube Dilution (MIC) & (MBC)
11.	Serological and Biochemical Identification of Microorganisms	- API Staph *for* Identification of clinical staphylococci and micrococci

		- Quelling test - *Staphurex* - *Streptex Lancefield Grouping* - *ASO titer*

Name of Course Coordinator: **Dr. Suzan Matar** Signature: *Suzan Matar* Date: 2-2024

Head of Curriculum Committee/Department: **Dr. Suzan Matar** Signature: *Suzan Matar*

Head of Department: **Dr. Ahmed Abu siniyeh** Signature: *Ahmed Abu siniyeh*

Head of Curriculum Committee/Faculty: **Dr. Muayyad Al Hseinat** Signature: *Muayyad Al Hseinat*

Dean**: Prof. Mahmoud Jaghoub** Signature: *Mahmoud Jaghoub*