



**Jordan University of Science and Technology**  
**Faculty of Veterinary Medicine**  
**Veterinary Medicine And Surgery Department**

VM725 Concepts And Methods Of Antimicrobial Resistance(Lab)

Second Semester 2024-2025

**Course Catalog**

0 Credit Hours. This course explores the fundamental and advanced concepts of antimicrobial resistance (AMR), its drivers, and global impact. Students will learn how bacteria develop and transmit resistance, study key mechanisms (enzymatic inactivation, efflux pumps, target modification), and train in phenotypic and molecular laboratory detection methods. Practical sessions emphasize antimicrobial susceptibility testing (AST) and resistance mechanism detection using conventional microbiology. The course also introduces bioinformatics tools for whole genome sequencing (WGS) analysis to detect resistance genes in silico, focusing on simple and accessible platforms.

**Teaching Method:** On Campus

**Text Book**

<b>Title</b>	Antimicrobial Resistance in Bacteria from Livestock and Companion Animals
<b>Author(s)</b>	Schwarz, S., Cavaco, L. M., & Shen, J.
<b>Edition</b>	1st Edition
<b>Short Name</b>	1
<b>Other Information</b>	2018

**Instructor**

Name	<b>Prof. Mohammad Gharaibeh</b>
Office Location	G1 L-1
Office Hours	
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**Class Schedule & Room**

**Section 1:**

Lecture Time: Wed : 14:00 - 16:00

Room: LAB

**Tentative List of Topics Covered**

<b>Weeks</b>	<b>Topic</b>	<b>References</b>
Week 1	Introduction to AMR: definitions, history, and global burden	From 1
Week 2	Mechanisms of resistance: enzymatic inactivation, efflux, target modification	From 1
Week 3	Genetic basis of resistance: plasmids, transposons, integrons, horizontal gene transfer	From 1
Week 4	Antimicrobial susceptibility testing: principles, CLS/EUCAST standards	
Week 5	Laboratory methods: disk diffusion, MIC determination, E-test	From 1
Week 6	Detection of specific resistance mechanisms: ESBL, carbapenemase, MRSA, colistin resistance	From 1
Week 7	Molecular and rapid diagnostic methods	From 1
Week 8	Quality control in AST and resistance detection	From 1
Week 9	Introduction to WGS and bioinformatics	From 1
Week 10	Hands-on: ResFinder, CARD, AMRFinderPlus	From 1
Week 11	One Health perspectives on AMR (animals, humans, environment)	From 1
Week 12	National and international AMR surveillance systems (WOAH, WHO, FAO)	From 1
Week 13	Case studies: interpreting lab results and applying to clinical/veterinary practice	From 1
Week 14	Student presentations and discussion of emerging AMR challenges	From 1
Week 15	Course review and preparation for final assessment 1	From 1
Week 16	Course review and preparation for final assessment 2	From 1

**Policy**

Attendance	80% minimum for theory and practical sessions.
Academic Integrity	Plagiarism and data fabrication not tolerated.

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