Course Description Form

1. Course Name/ theoretical
Microbiology
2. Course Code: ZUDE0308
3. Semester / Year: 2025-2026
Annual
4. Description Preparation Date: **10/8/2025**
5. Available Attendance Forms:
Lectures (Theory) + Labs (Practical, Weekly)
6. Number of Credit Hours (Total) / Number of Units (Total)
60 hours (Theoretical) + 60 hours (Practical). (Two theoretical hours and th practical hours per week)
7. Course administrator's name (mention all, if more than one name)
Theoretical part: Name: Rand Sajid Abd Al-Khuder E-mail: Rand.Sajid@alzahu.edu.iq
8. Course Objectives

Course Objectives	1. Enable students to learn about microbiology and its divisions, as it includes the study of bacteriology, immunology and viruses, in addition to studying parasites and fungi, especially those related to oral diseases. 2. Enable students to identify the different types of bacteria, positive and negative for gram stain, phenotypic characteristics, characteristics of each bacterial type, pathogenic factors, virulence, enzymes and various toxins that cause the development of the disease and study the ways of transmission of each bacterial type and how to control the spread of epidemic diseases. 3. Enable students to acquire the skills of diagnosing and differentiating various bacterial diseases using microscopy, microbial culture and serological tests aimed at bacterial diagnosis, as well as using various laboratory experiments

	to diagnose fungal infections, studying immunological and viral tests, and knowing the sensitivity of microbial isolates to the most important antibiotics for use in treatment. 4. Enabling students to understand the principles of immunology, which include identifying the sections of immunology and its components, immune cells and their development and their role in defending against various types of diseases, types of antibodies, immune factors present in the mouth and saliva, allergic reactions and their mechanisms, the most important autoimmune diseases, phagocytosis, and the role of the complement factor. 5. Enabling students to learn about the science of viruses, the characteristics of viruses, their types and divisions, and a detailed study of viral diseases related to the dental profession, such as hepatitis viruses, oral viruses, influenza virus, AIDS, their spread methods, forms, and their role in disease development and control, especially by using vaccines. 6. Enable students to know the relationship between various microorganisms in human body, the importance of their natural existence and the factors that t them into pathogenicity.

9. Teaching and Learning Strategies

Strategy	1- Use PowerPoint lectures. 2- Method of debate and discussion. 3- Using smart screens and whiteboards to display scientific material. 4- Education in laboratories to acquire scientific skills. 5- Reports and projects. 6- Student groups and Workshops. 7- Scientific trips. 8- Oral discussions

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First Semester					
1	2 hrs. Theory 2 hrs Practical	Essential Biosafety Protocols and Laboratory Rules	Orientation to the Microbiology laboratory	Power Point	quizzes + Quarterly exam.
2	2 hrs. Theory 2 hrs Practical	Light microscope electronmicroscope	The microscope	Power Point	quizzes + Quarterly exam,
3	2 hrs. Theory 2 hrs Practical	Sterilization by moist heat FILTRATION chemical sterilization. DISINFECTION AND THE DENTAL LABORATORY	Sterilization and disinfection	Power Point	quizzes + Quarterly exam.

4	2 hrs. Theory 2 hrs Practical	Introduction to Bacterial Reproduction The Bacterial Growth Curve Environmental and Nutritional Requirements (Factors Affecting Growth)	Bacterial growth	Power Point	quizzes + Quarterly exam.
5	2 hrs. Theory 2 hrs Practical	Introduction and Core Components Classification Based on Physical State Classification Based on Chemical Composition Quality Control and Media Preparation	Types of culture media	Power Point	quizzes + Quarterly exam.
6	2 hrs. Theory 2 hrs Practical	ntroduction to the Pre-Analytical Phase Preservation and Transport Media Specimen Transportation and Storage Conditions	Sampling and transport of test material	Power Point	quizzes + Quarterly exam.
7	2 hrs. Theory 2 hrs Practical	Fundamentals of Microbial Cultivation Methods for Isolating Pure Cultures	Laboratory cultivation of microorganisms	Power Point	quizzes + Quarterly exam.
8	2 hrs. Theory 2 hrs Practical	Cultural Characteristics on Differential and Enriched Media Optical and Chromogenic Characteristics Fundamentals of Macroscopic Identification	Bacterial identification: 1-Macroscopical characteristics (colonial morphology and cultural characteristics).	Power Point	quizzes + Quarterly exam.
9	2 hrs. Theory 2 hrs Practical	Preparation of Bacterial Smears Principles of	2. Microscopical examination	Power Point	quizzes + Quarterly exam.

		Staining (Differential & Structural Staining) Advanced Microscopy in Clinical Microbiology	(morphology of bacterial cells).		
10	2 hrs. Theory 2 hrs Practical	. Physics and Chemistry of Dye Differential Staining Mechanisms	Staining	Power Point	quizzes + Quarterly exam.
11	2 hrs. Theory 2 hrs Practical	Catalase Test Coagulase Test (Slide and Tube methods) Oxidase Test Urease Test Bacitracin sensitivity test	Biochemical tests (part 1).	Power Point	quizzes + Quarterly exam.
12	2 hrs. Theory 2 hrs Practical	Carbohydrate Fermentation Methyl Red Test Voges – Proskauer Test Citrate Utilization Test IMViC Tests	Biochemical tests (part 2).	Power Point	quizzes + Quarterly exam.
13	2 hrs. Theory 2 hrs Practical	Bile esculin test Indole test	Biochemical tests (part 3).	Power Point	quizzes + Quarterly exam.
14	2 hrs. Theory 2 hrs Practical	Terms Defined Methods of Antibiotic Susceptibility Testing Diffusion and Dilution	Antibiotic sensitivity test (part 1).	Power Point	quizzes + Quarterly exam.
15	2 hrs. Theory 2 hrs Practical	The Kirby-Bauer Mueller – Hinton Agar Procedure of The Kirby-Bauer Methods	Antibiotic sensitivity test (part 2).	Power Point	quizzes + Quarterly exam.
Second semester					
16	2 hrs. Theory 2 hrs Practical	Classification of antigen-antibody interactions ELISA Enzyme-Linked	Serological tests (antigen and antibody detection tests) (part 1).	Power Point	quizzes + report, Quarterly exam.

		Immunosorbent Assay (ELISA) Types of ELISA			
17	2 hrs. Theory 2 hrs Practical	Agglutination Precipitation Types of precipitation test	Serological tests (antigen and antibody detection tests) (part 2).	Power Point	quizzes + report, Quarterly exam
18	2 hrs. Theory 2 hrs Practical	Gel diffusion Immunoelectrophoresis single Radial Immunodiffusion	Nucleic acid assays, Animal pathogenicity test	Power Point	quizzes +report Quarterly exam.
19	2 hrs. Theory 2 hrs Practical	STAPHYLOCOCCI Scientific Classification Characters of Staphylococci Grouping of Staphylococci	Staphylococci	Power Point	quizzes +report Quarterly exam.
20	2 hrs. Theory 2 hrs Practical	Pathogenesis of S. aureus infections Virulence factors Streptococci Diseases Laboratory diagnosis Antibiotic Therapy	Streptococci	Power Point	quizzes + report ,Quarterly exam.
21	2 hrs. Theory 2 hrs Practical	General Characteristics & Taxonomy Pathogenesis & Virulence Factors of Corynebacterium diphtheria Prevention and Treatment	Corynebacterium	Power Point	quizzes +report , Quarterly exam.
22	2 hrs. Theory 2 hrs Practical	Morphology and identification growth Characteristics	Spore-forming Grampositive bacilli:	Power Point	quizzes +report , Quarterly exam.

		Bacillus anthracis			
23	2 hrs. Theory 2 hrs Practical	Bacillus species Clinical infection in humans Cutaneous anthrax Gastrointestinal anthrax Virulence factors	Bacillus spp.	Power Point	quizzes +report, Quarterly exam
24	2 hrs. Theory 2 hrs Practical	Clostridium spp. Habitat Characteristics Culture and identification Pathogenicity Treatment and prevention	Clostridium spp.	Power Point	quizzes + report, Quarterly exam.
25	2 hrs. Theory 2 hrs Practical	Pathogenesis and Immune Response of Mycobacterium tuberculosis Laboratory Diagnostic Framework	Mycobacterium spp.	Power Point	quizzes + report, Quarterly exam.
26	2 hrs. Theory 2 hrs Practical	Enterobacteriaceae Four major features Genus : Pseudomanas is separated from a family Enterobacteriaceae Representative genera of Enterobacteriaceae that are Medically Important	Enterobacteriaceae (part1)	Power Point	quizzes +report Quarterly exam.
27	2 hrs. Theory 2 hrs Practical	Culture methods Enterics classified Virulence and Antigenic	Enterobacteriaceae (part2)	Power Point	quizzes +report Quarterly exam.

		Factors of Enterics			
28	2 hrs. Theory 2 hrs Practical	Escherichia coli Infections Klebsiella species Proteus	Enterobacteriaceae (part3)	Power Point	quizzes + report , Quarterly exam.
29	2 hrs. Theory 2 hrs Practical	Morphology and Identification Growth Characteristics NEISSERIA gonorrhoeae Pathogenesis, Pathology, and Clinical Findings	Neisseriae spp.	Power Point	quizzes + report, Quarterly exam.
30	2 hrs. Theory 2 hrs Practical	Introduction and discovering of viruses General Properties of Viruses Classification of viruse Interferon Viral persistence Viruses are able to persist to cause chronic infection	Virology	Power Point	quizzes + report, Quarterly exam.

11. Course Evaluation

- Midyear written exam: 15 marks
- Annual pursuit: 25 marks
- Final clinical exam: 20 marks

Final written exam; 40 marks

12. Learning and Teaching Resources

Required textbooks (curricular books, if any	Oral microbiology, William,A. Mosby,1982
Main references (sources)	❖ .Samaranayaka,L.,Kuby Immunology Eighth Edition ©2019 ❖ Punt,J.,Sanford,S.,Jones,P.,Owen,J.:Essential Microbiology for Dentistry 5th Edition (2018)
Recommended books and references (scientific journals, reports...)	❖Mdj Clinical Immunology A Virology
Electronic References, Websites	www.kcom.edu/faculty /chamberlian /courses .htm http://www.ncbi.nlm.nih.gov/books/bv Electronic library , wesby University international sites