**Subject: Microbiology**

**Course Book – (Year: 1)**

**Academic Year: 2022/2023**

**Course Book**

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| **1. Course name** | **Theoretical Medical Microbiology** | |  | |
| **2. Lectur.** | **Dr. Sawsan Mohammed Abdulla Al-Sorchee** | |  | |
| **3. Department/** | **Biology** | |  | |
| **4. Contact-** | **e-mail:** [**sawsan\_sorchee@yahoo.com**](mailto:sawsan_sorchee@yahoo.com) | |  | |
| **Course code** | **EdB0302** | |  | |
| **5. Time (h)** | **Theoretical 2 hours** | |  | |
| **6. Teacher's academic profile** | 1. **Personal Information**   Date of birth: April 3rd, 1968  Marital status: Married  Nationality: Iraqi   1. **Academic qualifications**   Ph.D. / Baghdad University, College of Education, Biology Department, (2009)  M.Sc. / Baghdad University, College of Education, Biology Department, (2005)  B.Sc. / Baghdad University, College of Sciences, Biology Department, (1990)   1. **Degree requirements**  * **Ph.D. thesis:** Comparative study of the effect of some plant extracts on bacterial causatives of diarrhea in children in Erbil city * **M.Sc. thesis:** Immunological Study on Toxoplasmosis Women with a History of Abortion. * Laboratory technician in Telha Private Microbiology Diagnostic Laboratory, Baghdad: diagnosis of clinical cases by bacteriological culture, serological, immunological and direct examination methods. (1990– 1991) * Science teacher in a Girls’ Secondary School, Baghdad: teaching Science and Public Health to Grade 10 and 11 students using different teaching methods and practical demonstrations. (1990-1991) * Assistant Lecturer in the Microbiology Department, College of Education, Baghdad University: giving the talk of the practical sessions of Immunology and Microbiology to fourth year College students then supervision of the practical application by students.   (2002-2007)   * Laboratory technician in Al-Jemhoori Public Hospital and Raparine Children’s Hospital Microbiology Diagnostic Laboratory: diagnosis of clinical cases by bacteriological culture, serological, immunological and direct examination methods, in addition to diagnosis of viral diseases using ELISA technique. (2006-2008) * Lecturer in the biology Department, College of Education, Baghdad University: giving lectures to fourth year students in Immunology and Microbiology in addition to the supervision of the practical sessions. (2007-2012) * Assistant professor In the biology Department, College of Education, Sallaldeen University: the supervision of the practical microbiology laboratories sessions. (2012-2019) | |  | |
| **8. Course overview:** Medical microbiology is both a branch of medicine and microbiology which deals with the study of mi microorganisms including bacteria, viruses, fungi and parasites which are of medical importance and can cause diseases in human beings. It includes the study of microbial pathogenesis and epidemiology and is related to the study of disease  pa pathology and immunology. Microorganisms have a tremendous impact on all life and the physical and chemical makeup of our planet. They are responsible for cycling the chemical elements essential for life, including carbon, nitrogen, sulfur, hydrogen, and oxygen; more photosynthesis is carried out by microorganisms than by green plants. This course will introduce students to the microbial species that cause human disease. We will cover bacteria, fungi, viruses, and protozoa, an discuss current topics including antibiotic resistance, public health threats, and global health. Humans also have an intimate relationship with microorganisms; more than 90% of the cells in our bodies are microbes. The bacteria present in the average human gut weigh about 1 kg, and a human adult will excrete his or her own weight in fecal bacteria each year. | | |  | 2+3 | | 2-The Classification and Identification of Bacteria:  [Bacterial shapes](http://www.bmb.leeds.ac.uk/mbiology/ug/ugteach/icu8/introduction/bacteria.html#shapes)  -Bacterial cell walls  -[Properties associated with bacterial cell walls](http://www.bmb.leeds.ac.uk/mbiology/ug/ugteach/icu8/introduction/bacteria.html#cell_walls) [the genetic make up of bacteria](http://www.bmb.leeds.ac.uk/mbiology/ug/ugteach/icu8/introduction/bacteria.html#genetics) | | | |
| **9. Course objective:**  The primary goal is to enhance communication between the community, teachers, students and parents. The Medical Microbiologycourses will provide opportunities for students to develop and communicate an understanding of microorganism such as bacteria , viruses, fungus and other prokaryotic organisms. Concepts covered in this course include introduction to science of microbiology, classification, identification, pathogenesis, immunity and protection, the important medical microbes , soil microbes , natural water , sewage and atmosphere microbes, food and dairy products microbes, and industrial microbiology. | | |  | 4+5 | | Microbial Metabolism | | | |
| **10.**  The purpose of this course is to establish the student pharmacist’s foundation in the principles of medical microbiology, immunology and virology that will build upon the knowledge and skills gained in the Pathophysiology and Patient Assessment course sequence. In order to successfully manage a patient with an infectious disease, the student pharmacist must first understand the role of the host’s immunologic response and the burden of disease caused by clinically important pathogens. The content in this course will lay the foundation for the subsequent patient care series where the pharmacology and medicinal chemistry of anti-infective agents and pharmacotherapy of infectious diseases will be learned and applied to optimize the care of a patient | | |  | 6+7 | | Elements of Microbial Nutrition, Ecology, and Growth | | | |
| **11. Forms of teaching**  Different forms of teaching will be used to reach the objectives of the academic year. Power point presentation for the head titles, definitions, classification of materials and any other illustrations. Worksheets will be designed to let the chance for practicing on several aspects of the course in the class room. Furthermore student will be asked to prepare research papers on selective topics and summaries articles content.  There will be classroom discussions, solve, analyze and evaluate problem sets, and different issues discussed throughout the year. To get the best of the course, it is suggested that the student attend classes as much as possible. The student will advised to read the required lectures, teacher notes regularly as all of them are foundation for the course. Lecture notes are fore supporting and not for submitting the reading material including the hands-out. The students are directed to participate in class room discussions as much as possible, preparing the assignment given in the course. | | |  | 8+9 | | Microbial Genetics | | | |
| **12. Assessment scheme**  **The course grade will be determined as follows:**  **Course marks 40% (27% Theoretical, 13% Practical)**  **Final Exam 60% (40%Theoretical, 20%** **Practical)**  **‌** | | |  | 10+11 | | Antimicrobial Drugs | | | |
| **13. Course Reading List and References‌:**   * Foundations in Microbiology by Talaro, K.P. 2008 * Klein`s Microbiology by Willey , J., and Woolverton , C. 2007 * Medical Microbiology and immunology (2012) wareen levinson. * Microbiology (2009),Robert Bauman * Medical Microbiology (2012),jawetz Kavanagh, K. (2005). Fungi Biology and Applications. John Wiley & Sons Ltd, the Atrium, Southern Gate, Chichester, West Sussex PO19 8SQ, England. * Brooks, G. F.; Carroll, K. C.; Butel, J. S. and Morse, S.A. (2007). Jawetz, Melnick; and Adelberg’s Medical Microbiology, 24thed. McGraw-Hill Companies, U.S.A. * Webster, J. and Weber R. W. S. ( 2007). Introduction to Fungi. 3ed ed. Published in the United States of America by Cambridge University Press, New York- USA. * Hospenthal, D. R.and. Rinaldi, M. G. (2008). Diagnosis and Treatment of Human Mycoses. Humana Press Inc, USA. * Rogres,K. (2011). Fungi , Algae, and Protists. Britannica Educational Publishing (a trademark of Encyclopadia Britannica in association with Rosen Educational Services), New York-USA. | | |  | 14+15 | | Microbial Mechanisms of Pathogenicity | | | |
| 1 | | 1- A Brief Introduction to Microbiology  -Viruses - fungi -parasites –Helminthes –Protozoa –Bacteria |  | | Infections | | | |
| 2 | | -The Classification and Identification of Bacteria:  Bacterial shapes  -Bacterial cell walls  -Properties associated with bacterial cell walls the genetic makeup of bacteria |  | | The Human Normal Flora. | | | |
| 3 | | The Human Normal Flora in Health and Disease.  Microorganisms in Health and Disease. |  | | Microbiology of the Soil. | | | |
| 4 | | The Growth, Survival, and Death of Microorganisms and Microbial Nutrition |  | | Microbiology of the water and sewage. | | | |
| 5 | | Cultivation of Microorganisms |  | | Microbiology of the atmosphere. | | |
| 6 | | Microbial Metabolism |  | | Microbiology of the food and dairy products. | | | |
| 7 | | Microbial Genetics |  | | Industrial Microbiology.  Second – term examination | | | |
| 8 | | Antimicrobial Drugs----- Antiviral and anti-parasitic drugs |  | |
| 9 | | pathogenesis of Bacterial Infection |  | |
| 10 | | The Fungi And The Algae |  | |
| 11 | | Seasonal Examination. |  | |
| 12 | | Physical and Chemical Agents for Microbial Control |  | |
| 13 | | The viruses: major groups of viruses. Structure, replication, infection of host cell, outcome of viral infection, viral pathogenesis. |  | |
| 14 | | Sterility testing of all pharmaceutical products.  .  Microbial assays of antibiotics, vitamins & amino acids. |  | |
| 15 | | Immunity, primary and secondary, defensive mechanisms of body, microbial Resistance, interferon |  | |
| 16 | | Impact of infectious diseases, Koch’s postulates, Host Response: Innate immunity , Host Response: Acquired Immunity (B cells) , Host Response: Acquired Immunity (T cells) |  | |
| 17 | | Serum and vaccines |  | | Immunology and host defense mechanisms | |
| 18 | | Microbiology of the water and sewage-- Microbiology of the Soil an Environmental and Applied Microbiology- |  | |  | |
| 19 | | Microbiology of the atmosphere. A Industrial Microbiology-Microbiology of the food and dairy products |  | |  | |
| 20 | | Microbial Toxins-  Enteric Pathogens –*Cholera*  Enteric pathogens – *Salmonella,*  *Shigella, E. coli* |  | |  | |
| 21 | | Extracellular pathogens –*Staphylococcus, Streptococcus*  Facultative intracellular pathogens –*Mycobacterium*  Obligate intracellular pathogens –*Chlamydia, Rickettsia* |  | |  | |
| 22 | | Accidental pathogens – *Pseudomonas,*  Chronic pathogens – *Helicobacter pylori* |  | |  | |
| 23 | | Sexually transmitted diseases –*Gonorrhea, Syphilis*  Zoonoses – *Borrelia burgdorferi*  Bioterrorism – Anthrax |  | |  | |
| 24 | | Viruses transmitted  via air: Influenza, Rhinovirus, Viral diseases of childhood: Measles, Mumps-Viruses transmitted via food or water: Rotavirus, Polio, Hepatitis A, |  | |  | |
| 25 | | Oncogenic viruses: Human  Papillomavirus, KSHV, HTLV Latent viruses: HSV |  | |  | |
| 26 | | Fungal pathogens - - |  | |  | |
| 27 | | Seasonal Examination |  | |  | |
| **Practical’s 3 hrs. /week** | | Experiments devised to prepare various types of culture media, sub culturing of common aerobic and anaerobic bacteria, fungus and yeast, various staining methods, various methods of isolation and identification of microbes, sterilization techniques and their validation, evaluation of antiseptics and disinfectants, testing the sterility of pharmaceutical products as per I.P. requirements, microbial assay of antibiotics. This course will introduce the student to the underlying principles of immunology. Its primary emphasis will be on the cellular and non-cellular components of the human immune system and the ways in which these components interact to provide immunity. Upon completion of this course students will be expected to  1. Describe the major divisions of the immune system;  2. Describe humoral immunity and cell-mediated immunity;  3. Compare and contrast innate and acquired immunity;  4. introducing to antigens and antibodies;  5. Discuss the role of immune cells, their function with regard to cell signalling, and hematopoiesis;  6. Discuss the immune response to specific pathogens; and  7. Describe the nature of self and non-self-cells and tissues |  | |  | |
| 2-5-2017 | | Final Examination. |  | |  | |