Department of ……Biology……..

College of …Science…….

University of …Duhok…….

Subject: Medical Bacteriology….

Course Book – (Year 4) Morning

Lecturer's name: Ali Yahya Saeed

Academic Year: 2022/2023

Course Book

1. Course name	**Medical bacteriology**
2. Lecturer in charge	**Dr.Ali Yahya Saeed**
3. Department/ College	**Biology/Science**
4. Contact	**e-mail:ali.saeed@uod.ac** **Tel: (optional)**
5. Time (in hours) per week	**Theory: 2** **Practical: 2**
6. Office hours	
7. Course code	
8. Teacher's academic profile	After I obtained my M.Sc in the field of Microbiology/Virology in 1992 I directly joined to University of Duhok which was founded in the same year. I appointed officially at the college of Medicine and taught subject Biology, 2nd semester both theory and practice for 1st year medical students. In second year, I taught Histology both theory and practice and spent hundreds of hours reading and viewing microscopic slides in association with color atlas. In 3rd year I taught Microbiology including bacteriology, Virology, Parasitology and even I shared with other lecturers in the subject of Physiology. I taught subject Microbiology both theory and Practice tell 2000. Beside my teaching I practiced in the Azadi Laboratory and achieved many researches and worked as a supervisor of the department of Diagnostic bacteriology. During this period, I was head of the department of Microbiology and participated in many activities like member of examination committees and organizer of university anniversaries. In 2000 I moved to the college of Veterinary Medicine there I taught Microbiology tell 2014. During this period, I was head of the high education unit and head of the Duhok Veterinary Research Center. Many researches were achieved in the center in corporation with Borstel Institute/Germany and General Directorate of Veterinary. I was also organizer of the workshop held in Erbil. In 2012 I moved to the department of Biology/College of Science as a teacher of the subject Microbiology. I graduated two M.Sc students in the field of Bacteriology and Immunology and taught courses of medical microbiology, General Microbiology and Immunology to Ph.D and M.Sc students. Now I am supervisor of one Ph.D student and two M.Sc students. I prepared illustrated manual of practical microbiology for students and all of the lectures provided in PDF and PPP Formats. I was organizer of the unit of continuous education and participating in many department committees like head of examination and higher education committees as well as

	participated in the workshop at Michigan University, USA.
9. Keywords	**Medical Bacteriology**

10. Course overview:

One of the important subjects to be studied in the department of Biology is medical bacteriology. Through this course students will be able to understand how to collect clinical samples properly from different bacterial infections. Students will be able to protect themselves from hazardous infectious materials and how to control any accident will happens in the laboratory. Through this course students will learn how pathogens are transmitted to human, what kind of clinical infection will cause and mechanisms of causing infections, types of samples necessary for laboratory diagnosis. At the end of the course students will be able to follow general outlines used for diagnosis of various bacterial infections as well as working with different diagnostic tests to reach the final diagnosis. Students will work with unknown samples in order to depend on themselves in making diagnosis and will be armed with good background when working in the clinical diagnostic laboratories of health sector.

11. Course objective:

The course has many objectives

1- Ability to know the principles of bacterial pathogenesis.
2- To know how to collect samples from clinical infections.
3- To be able to know how to deal with different clinical samples in the lab.
4- To be able to perform different diagnostics tests to approach the final diagnosis.
5- To be able to understand how to give interpretation to the results of the tests
6- To be able how to work with team during experiments.
7- To be able how to prepare a satisfied final report on his or her diagnosis
8- To be able to be undependable for making the final diagnosis

12. Student's obligation

At the beginning of the first lecture before going to the subject I make an agreement with students that will ensure their success. According to this agreement I want from students to

1- Regular attendance
2- Respect time of lecture
3- Active participation of the lecture
4- Do not feel any hesitation to ask me.
5- Criticize my teaching method in a polite way and find out another more suitable teaching method because the lecture for them not for me.
6- Respect the opinions of each other
7- Remember that you will be responsible for the next generations so be sincer and honest in your duties.

Then I ask them what do you want from me and their answer will be open during the course

13. Forms of teaching

The lectures will present mainly in the form of power point format but not in details but in the form of headlines supported by pictures and illustrating diagrams. Details will be explained on the whiteboard. Short Video will also possible. Students can also prepare lectures and give by themselves. Case presentation and discussion also will be presented. I am planning to share student with the lectures by creating a problem related to the topic and

will be declared in advance at the announcement board. All students should participate and prepared their selves for solving this problem. The lectures will be presented like previous years because students not participated and the lectures were passive and boring.

14. Assessment scheme

Assessment will be divided into two parts; class activity like following think, pair and share strategy, directing of challenge questions at the end of each lecture, discussion of the previous lectures with quizzes and presenting clinical cases of bacterial infections. Written exam with predetermined time and the questions will be a mixture of different styles like multiple choice questions, true and false, justification, fill in the blanks and short assay. The degree will be 40% (25% theory and 15% practice). The final examination includes both theory and practice and will be in 60% in which 40% for theory and 20% for practice. The theoretical final examination is usually three hours and covering all studied topics and usually consist of multiple-choice questions, explanation, justification and short answer questions.

15. Student learning outcome:

Mentioned in paragraph 11.

16. Course Reading List and References:

1- Medical Microbiology, 2013, by Jawetz, Melnick and Adelbergs.
2- The short textbook of Medical Microbiology by Satish Gupte, 10th Ed.2010
3- Microbiology an Introduction by Tortora G.J; Funke B.R., and Case C.l. 2010.
4- Essential Microbiology by Stuart Hogg, 2005.
5- Manual of Microbiology Tools and Techniques by Kanika Sharma, 2nded, 2008.
6- Bensons Microbiological applications by Alfred E. Brown, 10thed, 2007.

17. The Topics:	Lecturer's name
Bacterial Pathogenesis **Objectives:** Mechanisms used by pathogenic bacteria to cause infections	Dr.Ali Yahya Saeed Time:2 hrs
Normal microbial flora and probiotics. **Objectives:** Importance of normal flora, distribution of normal flora in different body sites and their role in health and disease	Dr.Ali Yahya Saeed Time: 2 hrs

production. Probiotics and their role in certain body disorders.	
Gram positive pyogenic cocci (Staphylococci) **Objectives:** -Differentiate pathogenic species from non pathogenic species - Clinical infections caused by Staph.aureus -Samples required for Staphylococcal infections diagnosis - Diagnostic test used for diagnosis of Staph.aureus - How to prevent and control Staphylococcal infections - Basics of treatment of Staphylococcal infections	Dr.Ali Yahya Saeed Time : 2 hrs
Gram positive cocci (Streptococci) **Objectives:** -Classification into different serogroups -Role of pathogenic species in different clinical infections - Differentiation between different species of Streptococci -Laboratory diagnosis of pathogenic species - Understanding how non suppurative complications develop in streptococcal infection	Dr.Ali Yahya Saeed Time : 2 hrs
Gram positive non spore forming bacilli **Objectives:** -Study the main characteristics of Corynebacterium diphtheria - Impact of diphtheria on the health -Laboratory tests used for identification. -Differentiation from non-pathogenic species called diphtheroids found as normal flora in skin and mucus membrane. -Study how Listeria monocytogenes cause food poisoning and its role in neonatal infections.	Dr.Ali Yahya Saeed Time : 2 hrs
Gram positive aerobic, spore forming bacilli **Objectives:** - Study the main features of Bacillus anthracis which can be differentiated from other non pathogenic species - How anthrax disease transmits to human - What are the main clinical pictures of anthrax in human - How to diagnose anthrax	Dr.Ali Yahya Saeed Time : 2 hrs
Review and examination	Dr.Ali Yahya Saeed Time : 2 hrs
Gram positive anaerobic, spore forming bacilli (Clostridium sp.) **Objectives:** 1-To study main infections caused by this heterogeneous group of bacteria. 2- To be able to know how to provide anaerobic environment for isolating these anaerobic bacteria. 3- To study the main features of each of them.	Dr.Ali Yahya Saeed Time : 2 hrs

Gram negative diplococcic (Neisseria sp.) **Objectives:** 1- To study the routes of transmission and mechanism of disease development in gonorrhoea and meningitis. 2- To study the laboratory tests used for identification of pathogenic species. 3- To be able to differentiated between pathogenic and non- pathogenic species with similar morphology. 4- To understand the role impact of sexually transmitted disease in the health both man and women. 5- To be able to give the final report in legal cases of gonorrhoea.	Dr.Ali Yahya Saeed Time : 2 hrs
Enterobacteraicease **Objective:** **1-**To know the true pathogen, opportunistic pathogens and non-pathogenic bacteria in this large group of Gram negative bacteria. 2- To be able to know different laboratory tests used for differentiation and identification of different members of this group of bacteria. 3- To study different clinical infections caused by these bacteria.	Dr.Ali Yahya Saeed Time : 2 hrs
Vibrio cholerae **Objectives:** **1-**To study the main feature of this pathogen 2-To know how this bacteria maintain its survival in aquatic environment. 3- To study how this bacteria cause diarrhoea 4- To be able to used different tests for final diagnosis of this bacteria.	Dr.Ali Yahya Saeed Time : 2 hrs
Haemophilus sp. **Objectives:** 1- To study the main characteristics of this kind of bacteria 2- To study the main clinical infections caused by these bacteria. 3- To know laboratory methods used for isolation and identification.	Dr.Ali Yahya Saeed Time : 2 hrs
Brucella sp. **Objectives:** 1- To study how Malta fever transmit to human 2- To know the source of infections 3- To study the clinical picture of infection 4- To know how to identify the causative agents	Dr.Ali Yahya Saeed Time : 2 hrs

Pseodomonas sp **Objectives:** 1- To study the main features of these bacteria and their distribution 2- To study their role in nosocomial infections 3- To know the tests used for their isolation and identification	Dr.Ali Yahya Saeed Time : 2 hrs
Mycobacterium sp **Objectives** **1-** To study the features of these large group of bacteria **2-** To know the clinical infections caused by these bacteria **3-** To know how to isolate and identify M.tuberculosis	Dr.Ali Yahya Saeed Time : 2 hrs
18. Practical Topics (If there is any)	
Lab# 1 Principle of Lab. Safety with general instruction	Dr. Ali Yahya Saeed Dr. Awaz Arshad Sozan Mosa Sharo MR. Younes
Lab.#2 Isolation and identification of normal flora from different body sites	Dr. Ali Yahya Saeed Dr. Awaz Arshad Sozan Mosa Sharo MR. Younes
Lab.#3 Isolation and identification of Staph,aureus from wound infection	Dr. Ali Yahya Saeed Dr. Awaz Arshad Sozan Mosa Sharo MR. Younes
Lab.#4. Diagnosis of Streptococci (Strept.pyogenes) from pharynx	Dr. Ali Yahya Saeed Dr. Awaz Arshad Sozan Mosa Sharo MR. Younes
Lab.#5. Diagnosis of Bacillus spp.	Dr. Ali Yahya Saeed Dr. Awaz Arshad Sozan Mosa Sharo MR. Younes
Lab.#6. Isolation and identification of E.coli from urine samples	Dr. Ali Yahya Saeed Dr. Awaz Arshad Sozan Mosa Sharo MR. Younes

Lab.#7. Isolation and identification of Proteus sp from urine samples	Dr. Ali Yahya Saeed Dr. Awaz Arshad Sozan Mosa Sharo MR. Younes
Lab.# 8. Isolation and identification of Klebsiella pneumoniae from urine samples	Dr. Ali Yahya Saeed Dr. Awaz Arshad Sozan Mosa Sharo MR. Younes
Lab.#10. Isolation and identification of Pseudomonas aerugnosa from burn swab	Dr. Ali Yahya Saeed Dr. Awaz Arshad Sozan Mosa Sharo MR. Younes
Lab.#11. Antimicrobial sensitivity test for Staph,aureus	Dr. Ali Yahya Saeed Dr. Awaz Arshad Sozan Mosa Sharo MR. Younes
Lab.#12. Antimicrobial sensitivity test for E.coli	Dr. Ali Yahya Saeed Dr. Awaz Arshad Sozan Mosa Sharo MR. Younes
Lab.#13. Antimicrobial sensitivity test for Pseudomonas aeruginosa	Dr. Ali Yahya Saeed Dr. Awaz Arshad Sozan Mosa Sharo MR. Younes
Lab.#14. Review	Dr. Ali Yahya Saeed Dr. Awaz Arshad Sozan Mosa Sharo MR. Younes
Lab.#15. General examination	Dr. Ali Yahya Saeed Dr. Awaz Arshad Sozan Mosa Sharo MR. Younes

19. Examinations:

1. Multiple choice questions

Choose the most appropriate answer

a. All of the following bacteria can cause food poising except?
   - *a- Stap.aureus*
   - *b- Clostridiun perfringens*
   - *c- Listeria monocytogens*
   - d- *Vibrio cholerae*.

b. The main bacterial cause of UTI in females is
   - *a- Staph.saprophyticus*
   - *b- E.coli*

c- Pseudomonas aeruginosa

d- Enterococcus faecalis

2. Answer the following short assays

1- How the following bacteria prevent phagocytosis
   a- Staph.aerus
   b- Strept.pyogenes
   c- N.gonorrhea
   d- Listeria monocytogenes

2- Write about antigenic structure of V.cholerae

2.True or false type of exams:

Write true (T) for correct answers and false (F) for wrong answers

a- Food poisoning in Staph.aureus is due to the ingestion of contaminated food by bacteria.

b- Septic shock only caused by endotoxin of Gram negative bacteria

c- Identification of C.diphtheriae depends on slide stained by loefflers methylene blue to see volutine granules..

d- Capsule id the major antigen in H.infleunzae type B

3- Short cases

Swab from wound on blood agar revealed medium sized, 2-3 mm in diameter and beta hemolytic colonies. Gram stained smear showed Gram positive cocci in cluster (8 mark).

A. What is your suspected pathogen?
B. How to confirm your diagnosis?
C. What is the selective media for this pathogen and how growth appears on it.
D. How this pathogen develops resistant against antibiotics mainly penicillins?

A premature (less than 37 weeks) newborn baby developed sever fever. Procalcitonin test was positive (this test is used to distinguish between bacterial and non- bacterial causes of sepsis). A blood culture showed growth of large mucoid pinkish colonies on Mac Conkey agar. Gram stained smear

1- What is your suspected diagnosis?

2- How to confirm your diagnosis?

3- Which structure of this bacterium responsible for fever and illness?

4- What is the virulence factor of this bacterium?

5- What is the source of infection for this case?

6- Is this causative agent true pathogen or opportunistic pathogen and why?

7- What makes this bacterium to be resistant to a wide range of beta lactams drugs?

8-Name two other clinical infections caused by this bacterium

9-Treatment should be initiated immediately or waiting for the results of drug sensitivity test.

10-What is the name of serological test used for diagnosis of this bacterium from colonies?

20. Extra notes:

Here the lecturer shall write any note or comment that is not covered in this template and he/she wishes to enrich the course book with his/her valuable remarks.

21. Peer review **پێداچوونەوەی هاوەڵ**

This course book has to be reviewed and signed by a peer. The peer approves the contents of your course book by writing few sentences in this section.

(A peer is person who has enough knowledge about the subject you are teaching, he/she has to be a professor, assistant professor, a lecturer or an expert in the field of your subject).

ئەم کۆرسبووکە دەبێت لەلایەن هاوەڵێکی ئەکادیمیەوە سەیر بکرێت و ناوەرۆکی بابەتەکانی کۆرسەکە پەسەند بکات و جەند ووشەیەک بنووسێت لەسەر شیاوی ناوەرۆکی کۆرسەکە و واژووی لەسەر بکات.

هاوەڵ ئەو کەسەیە کە زانیاری هەبێت لەسەر کۆرسەکە و دەبیت پلەی زانستی لە مامۆستا کەمتر نەبێت.