The University of Jordan

Accreditation & Quality Assurance Center

COURSE Syllabus

1	Course title	Pharmaceutical Microbiology I 1202341
2	Course number	1202341
3	Credit hours (theory, practical)	3 (theory)
	Contact hours (theory, practical)	3 (theory)
4	Prerequisites/corequisites	Prerequisite: 0304101 (General Biology II)
5	Program title	PharmD
6	Program code	
7	Awarding institution	The University of Jordan
8	Faculty	Pharmacy
9	Department	Pharmaceutics and Pharmaceutical Technology
10	Level of course	Undergraduate
11	Year of study and semester (s)	Second semester of the 3rd year
12	Final Qualification	PharmD
13	Other department (s) involved in teaching the course	N/A
14	Language of Instruction	English
15	Date of production/revision	31 January 2016

16. Course Coordinator:

To be determined for each semester

17. Course instructors:

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18. Course Description:

This course covers the basic information of microorganisms, their basic structure and mode of growth. Medical, pharmaceutical and environmental importance of some microorganisms. Anti-microbial chemotherapy: mode of action and prudent use.

19. Course aims and outcomes:

A- Aims:

1. Provide the students with the basic information about microorganisms, their basic structure and mode of growth
2. Introduce some microorganisms that have medical, pharmaceutical and environmental importance.
3. Provide the students with the basic information about the different types of antimicrobial therapy, their prudent use and their mode of action

B- Intended Learning Outcomes (ILOs): Upon successful completion of this course students will be able to …

A- Knowledge and Understandings:

A.1 Know the importance of studying microbiology its scope, the major events in the early history of microbiology, the germ theory of disease and the historical developments led to its formulation

A.2 know how the evolution in microscopy and staining led to progress in microbiology, and to get introduced to the light microscopy and electronic microscopy.

A.3 To get introduced to the common types of microbial stains, and the functions and results of each steps in the Gram staining procedure

A.4 Know the general characteristics of prokaryotic and eukaryotic cells

A.5 Know how prokaryotic cells differ in size, shape and arrangements

A.6 Know the structure and function of different components of the bacterial cell wall, cell membrane, internal structures, external structures

A.7 Know what is sporulation and its significance to microorganisms

A.8 Know the definition of bacterial growth, the different phases of bacterial growth and how it is measured.

A.9 Know the different physical factors that affect bacterial growth

A.10 Know the different methods used to obtain a pure culture

A.11 Know the commonly used media and the different nutritional requirements supplied by them, and the differences between selective, enrichment and differential media and their uses

A.12 know the dichotomous key used for naming microorganisms, and the significance of Bergey's manual as a microbiology reference

A.13 Know the general characteristics of viruses, how they are classified and cultured

A.14 Know the methodology of bacterial and animal viruses replication

A.15 Know how viruses cause latent infection, teratogenic effect and cancer

A.16 Know the properties of virus like agents

A.17 Know what is a parasite and what are the principles of parasitology

A.18 Know what are fungi and their importance, classifications

A.19 Know the different parasitic helminthes groups

A.20 Know the meaning of chemotherapy and antibiotics

A.21 know the meaning of selective toxicity, spectrum of activity in the context of antimicrobial agents.
A.22 Know the meaning, causes and the proper way to control microbial resistance towards antimicrobial agents.

A.23 Know the properties, uses, side effects, and mode of action of antibacterial agents.

A.24 Know the properties, uses, side effects, and mode of action of antifungal, antiviral, antiprotozoal agents and anthelminthic agents.

A.25 Know the meaning of different terminology used to describe the microbe-host relationships.

A.26 Know the meaning of the following terminology, contamination, infection, infectious disease, notifiable infectious diseases, nosocomial infections, non-infectious diseases, communicable and non-communicable infectious diseases, pathogens, pathogenicity, virulency.

A.27 Know the significance of normal flora as a defense mechanisms, the different body normal flora and its classification

A.28 Know how microbes can cause infectious disease and the different stages that occur in the course of an infectious disease and what is meant by intoxification

A.29 Know certain terms used by epidemiologists to describe situations related to infectious diseases

A.30 know the infectious diseases of human organ system, for each organ

A.31 know the normal flora, the different infectious agents, their pathogenicity and virulency, main signs and symptoms, the control of this infectious disease, by the host or by antimicrobial agents and the prevention by immunization and preventive measures. Diseases of the skin and eyes, urogenital and sexually transmitted diseases, Respiratory tract diseases, oral and gastrointestinal diseases, cardiovascular, lymphatic and systemic disease and nervous system diseases.

B- Cognitive and Intellectual Skills:

B.1 Identify the different types of microorganisms

B.2 Recommend the first line antimicrobial therapy for different infectious Diseases

B.3 Recommend the best immunization, protective and prophylactic method against infectious disease

B.4 Advise people on the virulency and pathogenicity of different microorganisms and the different protective measures to be taken

C- Subject specific practical skills:

They are mainly accomplished through the practical course

C.1 isolate and identify microorganisms

C.2 perform Gram stain

C.3 Grow bacterial culture on solid and liquid media

C.4 identify the different sources of microbial contamination

C.5 perform the techniques of bacterial pure culture isolation

C.6 microscopic and microscopic identification of microorganisms

C.7 Be aware of the different infectious diseases and their control methods

C.8 be able to advise on the different immunization and prophylactic measures against infectious diseases

D- Transferable Skills:

D.1 Communicate with the patients on the appropriate antimicrobial treatment and the prophylactic and preventive measures against different infectious disease

D.2 Communicate with the health professional on the different infectious agents and their control.

D.3 Develop the skills of self-learning

C- Program Competencies Achieved in This Course:

- Recognize main physiological and biochemical principles that govern normal body functioning
- Identify pathophysiological basis of major human diseases and their effects on body fluid composition
- Identify indications, side effects and contraindications of medicines
- Identify drug-drug and drug-food interactions of medicines
- Recognize the significance and identify the principles of infection control
- Identify the main mechanisms of action of drugs

20. Topic Outline and Schedule:

Topic	Week	Instructor	Achieved ILOs	Evaluation Methods	Reference
Scope & history of Microbiology	1		A1, B1	Exams	Microbiology: Principles and Explorations
Microscopy & staining	1-2		A2-A3, C1-C2	Exams	Same as above
Characteristics of Prokaryotic and Eukaryotic cells	2-3		A4-A7	Exams	Same as above
Growth & culturing of bacteria	3-4		A8-A11, C1, C3, C5	Exams	Same as above
An introduction to taxonomy	5		A12, C1, C6	Exams	Same as above
Viruses	5-6		A13-A16	Exams	Same as above
Eucaryotic Microorganisms and Parasites	6		A17-A19	Exams	Same as above
Antimicrobial Chemotherapy	7-8		A20-A24, C7, D1	Exams	Same as above
Host microbe relationships and disease processes	9		A25-A28	Quiz/ Exams	Same as above
Epidemiology and nosocomial infections	Self-reading		A29, C4, D3	Quiz/ Exams	Same as above

Diseases of the skin, eyes, wounds and bites	10		A30-A31, B3-B4, C7-C8, D1-D2	Exams	Same as above
Urogenital and sexually transmitted diseases	11		A30-A31, B3-B4, C7-C8, D1-D2	Exams	Same as above
Diseases of the respiratory system	12		A30-A31, B3-B4, C7-C8, D1-D2	Exams	Same as above
Diseases of the nervous system	13		A30-A31, B3-B4, C7-C8, D1-D2	Exams	Same as above
Oral and gastrointestinal diseases	14		A30-A31, B3-B4, C7-C8, D1-D2	Exams	Same as above
Cardiovascular, lymphatic and systemic diseases	15		A30-A31, B3-B4, C7-C8, D1-D2	Exams	Same as above

21. Teaching Methods and Assignments:

Development of ILOs is promoted through the following teaching and learning methods:

A. Teaching Methods:
- Lectures
- Self-Reading
- Multimedia demonstrations

B. Learning Skills:
- Critical thinking
- Scientific reasoning
- Digital literacy
- Communication skills
- Problem-solving skills
- Self-directed learning

22. Evaluation Methods and Course Requirements:

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

- Exams
- Quizzes

23. Course Policies:

A- Attendance policies:
- As per the applicable university regulations

B- Absences from exams and handing in assignments on time:
- As per the applicable university regulations

C- Health and safety procedures:
- N/A

D- Honesty policy regarding cheating, plagiarism, misbehavior:

- As per the applicable university regulations

E- Grading policy:

- Midterm exam (40%)
- Quiz (10%)
- Final (50%)

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

- University libraries
- Student computer labs
- University website (including E-Learning and faculty member websites)

24. Required equipment:

- Computer connected to the internet and data show projector
- Whiteboard and associated equipment

25. References:

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

- Jacquelyn G. Black & Laura J. Black. *Microbiology: Principles and Explorations*. John Wiley & Sons. 9th Edition (2015)

B- Recommended books, materials, and media:

- Karen C. Carroll, Janet Butel & Stephen Morse. *Jawetz Melnick & Adelbergs Medical Microbiology*. McGraw-Hill Education. 27th Edition (2015)
- M.T. Madigan, J.M. Martinko, K.S. Bender, D.H. Buckley & D.A. Stahl. *Brock Biology of Microorganisms*. Benjamin Cummings. 14th Edition (2014)
- Gerard J. Tortora, Berdell R. Funke & Christine L. Case. *Microbiology: An Introduction*. Benjamin Cummings. 12th Edition (2015)

26. Additional information:

Name of Course Coordinator: ----------Signature: ---------- Date: ----------

Head of curriculum committee/Department: ---------- Signature: ----------

Head of Department: ---------- Signature: ----------

Head of curriculum committee/Faculty: ---------- Signature: ----------

Dean: ---------- -Signature: ----------

Copy to:
Head of Department
Assistant Dean for Quality Assurance
Course File