Course specification
2017- 2018
Faculty of Pharmacy
Mansoura University

Third Level | **Course specification Pharmaceutical Microbiology**

University: Mansoura
Faculty : Pharmacy
Department : Microbiology and Immunology
Course title: Pharmaceutical Microbiology

Program on which the course is given	B. Pharm
Academic Level	Third Level, semester two
Date of course specification approval	13/11/2017

1- Basic Information : Course data :

Course title:	Pharmaceutical Microbiology	**Code:** PM321	
Specialization:	Pharmaceutical sciences		
Prerequisite: No			
Teaching Hours:	**Lecture:** 2	**Practical:** 1	
Number of units: (credit hours)	3		

2- Course Aims:

2. On completion of the course, the student will be able to explain basic information about the structure of microorganisms and their growth, describe different methods used for sterilization and evaluation of disinfectants, differentiate methods used for preserving pharmaceutical dosage forms, classify antimicrobials and explain resistance to antimicrobials.

Intended learning outcomes (ILO_S):

a- Knowledge and understanding

a1	Identify the principles of Microbiology
a2	Enumerate the theories of standardization methods of antimicrobials
a3	Distinguish appropriate Quality Control (QC) criteria to aseptic and sterile production facilities and other pharmaceutical industry.
a4	Discuss the principles of source of contamination, control of microbial contamination, sanitation, disinfection, sterilization methods and microbiological QC of pharmaceutical products.
a5	Classify the antimicrobials including mechanism of action, therapeutic uses, dosage, contraindications, adverse drug reactions and drug interactions.

a5	Identify the principles of quality assurance (QA) in education and of quality assurance of pharmaceutical processes and products.

b- Intellectual skills

b1	Recommend good manufacturing practice (GMP), good laboratory practice (GLP), good clinical practice (GCP) and good safety practice (GSP) guidelines in pharmaceutical technology, pharmaceutical research and pharmacy practice.
b2	Determine suitable methods of QC of antimicrobials as raw material, in dosage forms and in biological fluids.
b3	Develop appropriate methods for infection control and promote public health awareness.

c- Professional and practical skills

c1	Handle and dispose hazardous chemicals, biological and pharmaceutical preparations safely.
c2	Apply different qualitative and quantitative microscopical, and biological methods for identification, quality control (QC) and assay of raw materials as well as pharmaceutical preparations.

d- General and transferable skills

d1	Interact effectively in team working.
d2	Present information clearly in written, electronic and oral forms.
d3	Support patient, pharmaceutical and health care.

3- Contents :-

Week No	Topics	No. of hours	Lecture	Practical
1.	Introduction, history of microorganisms, microscopical examination and classification of bacteria Bacterial cell structure	2	2	
2.	Bacterial cell structure	2	2	
3.	Bacterial nutrition, transport processes, handling and storage of microorganisms Cultivation techniques	2	2	
4.	Isolation of pure bacterial culture Identification of bacteria, growth	2	2	

	and reproduction of bacteria. Fungi, Rickettsia, Coxiella and Chlamydia			
5.	Viruses	2	2	
6.	Methods of sterilization	2	2	
7.	**Week 7 Mid-term**			
8.	Chemical disinfectants, aseptic technique and sterility testing	2	2	
9.	Preservation of pharmaceutical dosage forms and Contamination of pharmaceutical dosage forms.	2	2	
10.	Antibiotics	2	2	
11.	Antivirals and antifungals	2	2	
12.	Mechanism of resistance and evaluation of antimicrobials	2	2	
	Week 15 Final written & oral			
	Practical topics			
1.	Bright-field light microscope Simple stain	2		1
2.	Differential stain Gram stain	2		1
3.	Differential stain Gram stain (repeat)	2		1
4.	Acid fast stain Spore stain Aseptic transfer of culture Streaking for isolation Culture characteristics of bacteria	2		1
5.	Techniques for bacterial counting Culture media for bacteria	2		1
6.	Biochemical activity of microorganisms Sterilization techniques	2		1
7.	**Week 7 Mid-term**			
8.	Determination of MIC by broth dilution method	2		1
9.	Determination of MIC by agar diffusion method	2		1
10.	Antibiotic assay by agar diffusion method	2		1
11.	Activity/ Revision/ Open discussion	2		1
	Week 13, 14 Practical exam			

4- Teaching and learning Methods:

5.1	Lectures using white board and data show.
5.2	Practical session using laboratory equipment
5.3	Research assignments
5.4	Case study
5.5	Discussion session

5- Student Assessment:

a- Assessment methods:

1-Written exam	To assess understanding, intellectual, professional
2-Practical exam	To assess professional and practical skills
3-Oral	To assess Knowledge, understanding, intellectual skills, general skills and confidence
4-Quizzes	To assess Knowledge, understanding and intellectual skills
5-Case study	To assess the skills of problem-solving and date presentation

b- Assessment schedule

Assessment 1	Practical	14th week
Assessment 2	Quiz	
Assessment 3	Mid-term	7th week
Assessment 4	Oral	15th week
Assessment 5	Written	15th week

c- Weighting of assessments

1	Mid-term examination	10 %
2	Final-term examination	50 %
3	Oral examination	15 %
4	Practical examination & Semester work	25 %
Total		100%

6 - List of References

N0.	Reference	type
1	Lippincott's Illustrated Reviews of Microbiology, 3rd Edition, 2013	Textbook
2	Hugo and Russell's Pharmaceutical Microbiology, 8th Edition, Blackwell, 2011	Textbook
3	Prescott, Harley and Klein's Microbiology, seventh edition, 2008	Textbook
4	Lectures notes prepared by staff members	Course notes
5	www.usp.org	website

7- Matrix of knowledge and skills of the course

No	Course contents	Study Week	ILOS			
			Knowledge & understanding	Intellectual skills	Professional and practical skills	General & transferable skills
1.	Introduction, history of microorganisms, microscopical examination and classification of bacteria Bacterial cell structure	1	a1	b3	c2	d1, d2
2.	Bacterial cell structure	2	a1	b3	c2	d1, d2
3.	Bacterial nutrition, transport processes, handling and storage of microorganisms Cultivation techniques	3	a1	b3	c1, c2	d1, d2
4.	Isolation of pure bacterial culture Identification of bacteria, growth and reproduction of bacteria. Fungi, Rickettsia, Coxiella and Chlamydia	4	a1, a4	b3	c1, c2	d1, d2
5.	Viruses	5	a1	b3	c2	d1, d2
6.	Methods of sterilization	6	a3, a4, a6	b1	c2	d1, d2, d3
7.	Chemical disinfectants, aseptic technique and sterility testing	8	a2, a3, a4, a6	b2	c1, c2	d1, d2, d3
8.	Preservation of pharmaceutical dosage forms and Contamination of pharmaceutical dosage forms.	9	a4, a6	b1, b3	c2	d1, d2, d3
9.	Antibiotics	10	a2, a5	b2, b3	c2	d1, d2, d3
10.	Antivirals and antifungals	11	a2, a5	b2, b3	c2	d1, d2, d3
11.	Mechanism of resistance	12	a2, a4	b2, b3	c2	d1, d2, d3

	and evaluation of antimicrobials					

Course Coordinator :	
Head of department	**Dr. Rasha M. Fathy Barwa**