The University of Jordan

Faculty: Pharmacy
Program: Pharmacy & Pharm D

Department: Pharmacetics & Pharmaceutical technology
Academic Year/ Semester: 2013/2014

Pharmaceutical Microbiology II (Course Number: 1202441)

<table>
<thead>
<tr>
<th>Credit hours</th>
<th>2</th>
<th>Level</th>
<th>4th yr</th>
<th>Pre-requisite</th>
<th>Coordinator/ Lecturer</th>
<th>Office phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course website</td>
<td></td>
<td></td>
<td></td>
<td>Pharmaceutical microbiology I</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Office hours

<table>
<thead>
<tr>
<th>Day/Time</th>
<th>Sunday</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Course Description

1. Introduce the students for the concept of sterilization, disinfection, antisepsis and preservation.
2. Introduce the students for the different chemical and physical methods used to control microbial contamination.
3. Introduce the students for the methods used for the evaluation of antimicrobial efficacy and factors affecting it.
4. Introduce the students for the principle of controlled environment, quality control and quality assurance.

Learning Objectives
Know the meaning of bacteriocidal, bacteriostatic and chemical sterilants.
Know the different biocides, their chemical nature, & their use
Know the methods used to evaluate biocidal agent activity
Know the factors that affect microbial spoilage, its outcome & how to protect the pharmaceutical products from it.
Know the principles of sterilization, methods & applications
How to select a suitable sterilization method
Know the principles of the controlled environment (aseptic and clean room facilities)
Intended Learning Outcomes (ILOs):
Successful completion of the course should lead to the following outcomes:

A. Knowledge and Understanding: Student is expected to
   A1- Know the meaning of biocide and the difference between biocide and antibiotic
   A2- Know the meaning of disinfection, antisepsis, and preservation process
   A3- Know the meaning of bacteriocidal, bacteriostatic and chemical sterilants.
   A4- Know the different biocides in use, their chemical nature, their spectrum of activity and their mode of actions.
   A5- Know the different chemical and physical factors that affect the antimicrobial activity
   A6- Know the effect of microorganisms on the spoilage of pharmaceutical preparations
   A7- Know the principle of preservation
   A8- Know the principle of sterilization
   A9- Know the different methods used for sterilization
   A10- Know the principle of the controlled environment (aseptic and clean room facilities)
   A11- Know the different quality control and quality assurance measures for the control of microbial contamination
   A12- Know the different in vitro tests used to evaluate the efficacy, the potency and the capacity of different biocides
   A13- Know the different sterile products available in the markets

B. Intellectual, Analytical and Cognitive Skills: Student is expected to
   B1- Decide the best biocide to be used in different practical situations
   B2- Interpret the results of the different tests used to evaluate the antimicrobial efficacy
   B3- Calculate the temperature and dilution coefficients of different antimicrobial agents and interpret the results towards their effect on the antimicrobial efficacy
   B4- Allocate the different measures to be taken to obtain an aseptic and clean environment and monitor those measures
   B5- Decide the appropriate test to be performed on different pharmaceutical preparation so as to measure their microbial quality
   B6- Decide the appropriate sterilization procedure for certain object
   B7- Calculate the appropriate time/temp schedule for an autoclaving process to produce specific quality assurance

C. Subject-Specific Skills: Student is expected to
   C1- Decide the suitable biocide to be used for certain situation or product
   C2- Design a suitable testing method to evaluate a biocidal agent
   C3- Design a suitable drug formulation & or packaging material for drug products
   C4- Design an aseptic or clean area in manufacturing plant
   C5- Select suitable sterilization process for specific object

D. Transferable Key Skills: Students is expected to
D1- Communicate effectively with the drug manufacturing bodies concerning GMP for microbial quality monitoring & aseptic manufacturing
D2- Gain basis for the design of different disinfection policies in hospitals or pharmaceutical industry
D3- Develop the skills of self-learning

ILOs: Learning and Evaluation Methods

<table>
<thead>
<tr>
<th>ILO/s</th>
<th>Learning Methods</th>
<th>Evaluation Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lectures</td>
<td>Exams, Quizzes,</td>
</tr>
<tr>
<td></td>
<td>Discussions,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Self reading</td>
<td></td>
</tr>
</tbody>
</table>

Course Contents

<table>
<thead>
<tr>
<th>Content</th>
<th>Reference</th>
<th>Week</th>
<th>ILO/s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disinfection &amp; antisepsis</td>
<td>Hugo &amp; Russell's</td>
<td>1, 2, 3</td>
<td>Know the different biocides in use, their chemical nature &amp; spectrum of activity</td>
</tr>
<tr>
<td>Mode of action</td>
<td>Hugo &amp; Russell's</td>
<td>4</td>
<td>Mode of action of biocides</td>
</tr>
<tr>
<td>Laboratory evaluation of antimicrobial agents</td>
<td>Hugo &amp; Russell's</td>
<td>5, 6, 7</td>
<td>Know the different in vitro tests used to evaluate the efficacy, the potency and the capacity of different biocides</td>
</tr>
<tr>
<td>Microbial spoilage, infection risk &amp; contamination control</td>
<td>Hugo &amp; Russell's</td>
<td>8, 9, 10</td>
<td>Know the different measures for the control of microbial contamination</td>
</tr>
<tr>
<td>Sterilization</td>
<td>Hugo &amp; Russell's</td>
<td>11, 12, 13</td>
<td>Know the principle of sterilization &amp; the different methods used for sterilization</td>
</tr>
<tr>
<td>Sterile pharmaceutical products</td>
<td>Hugo &amp; Russell's</td>
<td>14</td>
<td>To know the available sterile products in markets &amp; decide the most suitable method for sterilization</td>
</tr>
</tbody>
</table>

Self Reading:
Dressings
Implants
Absorbable haemostats
Surgical ligatures & sutures

Principles of good manufacturing practice (manufacture of sterile products)

| Hugo & Russell's | 15 | Allocate the different measures to be taken to obtain an aseptic and clean environment and monitor those measures |

First Quiz

| 13, 14, Oct /2013 |

Second quiz

| 10, 11, Dec /2013 |

Learning Methodology

Lectures

Discussions

Self Reading

Evaluation

<table>
<thead>
<tr>
<th>Evaluation</th>
<th>Point %</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midterm Exam</td>
<td>30%</td>
<td>To be announced</td>
</tr>
<tr>
<td>Quizzes</td>
<td>10% each</td>
<td>13, 14, Oct /2013</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10, 11, Dec /2013</td>
</tr>
<tr>
<td>Final Exam</td>
<td>50%</td>
<td>To be announced</td>
</tr>
</tbody>
</table>

Main Reference/s:


References: