**Course Description**

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| **Faculty** | **Pharmacy** |
| **Department**  | Pharmaceutics and Pharmaceutical Technology | **Level** | 7 |
| **Course**  | Pharmaceutical microbiology Practical | **Code** |  | **Prerequisite** | 1701200 (or Simultaneous) |
| **Credit hours** | 1 | **Theoretical**  | 3 | **Practical** | 1 |
| **Coordinator** |  | **Email** |  |
| **Teachers** | Dr. Yasser Gaber | **Emails** |  |
| **Lecture Time** |  | **Place** |  | **Attendance mode** | Face to face  |
| **Semester**  |  | **Preparation date**  |  | **Modification Date** |  |

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|  **Abstracted Course Description**  |
| This course aims to implement and augment the knowledge given in the course pharmaceutical microbiology. This course will give basics of laboratory microbiology including the culture of bacteria, isolation, sterility testing and some advanced experiments such as determination of the potency of some antimicrobials and disinfectants. Also the students will exercise microbial identification through gram staining. The students will practice various in vitro tests for evaluating antimicrobial agents & will perform some microbial quality tests for sterile and non-sterile products. |
| **Course Goals** |
| By the end of this course, the students will acquire essential skills for identifying microorganisms, measuring the efficacy and potency of different antimicrobial agents, using different sterilization methods and designing optimum sterilization cycles and monitoring microbiological quality for both sterile and non-sterile dosage forms make this pargraph as three point Microorganism Identification Skills: By the course's conclusion, students will develop proficiency in identifying various microorganisms. They will be adept at recognizing different types of bacteria, fungi, viruses, and other microbes, enabling them to understand their characteristics, behavior, and potential impact on different environments.Evaluation of Antimicrobial Agents: Students will be equipped with the expertise to assess the effectiveness and potency of diverse antimicrobial agents. They will learn how to conduct experiments and analyze data to determine the efficacy of antibiotics, disinfectants, and other agents against specific microorganisms, aiding in the development of new treatments or improving existing ones.Sterilization Techniques and Quality Control: Through the course, students will gain comprehensive knowledge about various sterilization methods. They will learn to design optimal sterilization cycles suitable for different environments and materials. Additionally, they will understand how to monitor and maintain microbiological quality standards for both sterile and non-sterile dosage forms, ensuring product safety and efficacy in pharmaceutical and healthcare settings |

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| **CILOs** |
| **Knowledge** |
| A.1 Know the laboratory safety rules in a microbiology laboratory A.2 Know the different qualitative and quantitative tests that are used to evaluate microbial susceptibility towards different antimicrobial agentsA.3 Know the different techniques that are used to monitor microbial quality of the environment and pharmaceutical preparations |
| **Skills** |
| . B.1 Calculate and interpret the MIC of different antimicrobial agentsB.2 Judge the microbial quality of different pharmaceutical preparation and environmental conditionsB.3 Quantifying microbial contamination |
| **Competencies** |
| C.1 Practical skills of aseptic techniquesC.2 Practical skills of handling microbial cultureC.3 Practical skills of identifying and quantifying bacterial culture |
| **Learning Methods** |
| * Lectures
* ORALL Discussion
* Assignment
 |
| **Evaluation Tools** |
| **Exams****Quiz**  |
| **Week** | **Topics** | **Learning methods** | **Evaluation tool** | **ILOs** | **Hours** |
| **1.** | IntroductionSafety in the laboratory, basic equipment in microbiology laboratory: Autoclave, Incubator, shaker incubator, -80 fridge, centrifuge, colorimetry (OD ) , pipettes , spreaders, swabs, loops. Syringe filters, Oven. Types of media, nutrient agar, selective media, other types of media. Types of incubation (aerobic, anaerobic, CO2 incubator)  | Laboratory notes and handouts | QUIZ | **A1** | **3** |
| **2.** | Selected examples of bacterial identification: gram positive cocci, Staphylococcus, Gram negative rods: E. coli , isolation, media , biochemical characterization | **A2** | **3** |
| **3.** | Sources of contamination experiment. Gram stain single bacteria  | Laboratory notes and handouts | Exam | **A3** | **3** |
| **4.** | IIsolation of bacterial mixture by plate streaking method. Gram stain mixture of bacteria | Laboratory notes and handouts | Exam | **B2** | **3** |
| **5.** | Effect of heat on bacterial growth – viable count technique | **B2** | **3** |
| **6.** | Revision | Laboratory notes and handouts | Exam | **B1** | **3** |
| **7.** | Exam – 1 | Laboratory notes and handouts | Exam | **C1** | **1** |
| **8.** | Determination of activity of different antiseptics using agar diffusion method  | Laboratory notes and handouts | **C2** | **3** |
| **9.** | Antibiotic sensitivity using agar diffusion method  | Laboratory notes and handouts | Exam | **C3** | **3** |
| **10.** | Determination of MIC using broth and two-fold dilution method  | Laboratory notes and handouts | **A1** | **3** |
| **11.** | Determination of MIC using broth and two-fold dilution method | Laboratory notes and handouts | homework | **A2** | **3** |
| **12.** | Determination of MIC using broth and two-fold dilution method | Laboratory notes handouts | **A2** | **3** |
| **13.** | Determination of MIC using broth and two-fold dilution method | Laboratory notes and handouts | Exam | **A1** | **3** |
| **14.** | Exam |  |  | **A1** | **3** |
| **15.** | Final Examinations |  |  |  | **2** |

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| **Plan of Course Evaluation** |
| **Evaluation Tools** | **Mark** | **ILOs** |
| **A1** | **A2** | **A3** | **B1** | **B2** | **B3** | **C1** | **C2** | **C3** |
| **First Exam (Mid-term)**  | **30%** | \* |  |  | \* |  |  | \* |  |  |
| **Second Exam (If available)** |  |  |  |  |  |  |  |  |  |  |
| **Final Exam** | **50%** |  | \* |  | \* |  | \* |  | \* |  |
| **Activities** | **20%** |  |
| **Activities Evaluation** | Homework/Tasks | 10% |  | \* | \* |  | \* |  |  | \* |  |
| Case Study  |  |  |  |  |  |  |  |  |  |  |
| Discussion and Interactions |  |  |  |  |  |  |  |  |  |  |
| Group Activities |  |  |  |  |  |  |  |  |  |  |
| Laboratory Exams |  |  |  |  |  |  |  |  |  |  |
| Presentations |  |  |  |  |  |  |  |  |  |  |
| Quizzes | 10% |  | \* | \* |  | \* |  |  |  |  |
| Others |  |  |  |  |  |  |  |  |  |  |
| **Total** | 100% |  |  |  |  |  |  |  |  |  |

 **Components**  |
| **Book** | 1. Hugo WB; Russell AD. Pharmaceutical Microbiology 7th edition. 2004. Blackwell Scientific Publications, Oxford.
2. Laboratory Notes of the department
 |
| **References** | 1. Hugo WB; Russell AD. Pharmaceutical Microbiology 7th edition. 2004. Blackwell Scientific Publications, Oxford.
2. Laboratory Notes of the department

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| **Recommended Readings** |  |
| **Electronic materials** |  |
| **Other websites** |  |

**Subject Coordinator:**

**Head of Curriculum Committee:**

**Department Head:**

**Faculty Dean:**

**Last update date:**