



Course Specification

— (Bachelor)

Course Title: Pharmaceutical Microbiology-1

Course Code: : MICR 387

Program: Pharmaceutical Sciences

Department: Pharmaceutics

College: Pharmacy

Institution: Najran University

Version: 3

Last Revision Date: 20 August 2024

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A. General information about the course:

1. Course Identification

1. Credit hours: 3(2+1)

2. Course type

- A. ☐ University ☐ College ☐ Department ☐ Track ☒ Program
- B. ☒ Required ☐ Elective

3. Level/year at which this course is offered: (5th Level, 3rd year)

4. Course general Description:

Topics of this course cover the fundamentals of bacteria, viruses, fungi, and parasites regarding their structure, classification, and genetics of medically important pathogens. In addition, the course includes enumeration of preventive and control measures of infectious diseases by sterilization, disinfection and antiseptics with special concern on antimicrobial, antiviral and antifungal agents.

5. Pre-requirements for this course (if any):

N/A

6. Co-requisites for this course (if any):

N/A

7. Course Main Objective(s):

1. Students will gain the basic knowledge about medically important pathogenic microorganisms (Bacteria, Viruses, Fungi and Parasites) regarding their structure, physiology, genetics and virulence factors.
2. Student will gain an understanding about various antimicrobial (antibacterial, antiviral, antifungal and antiparasitic) agents, their mechanisms of action, microbial resistance and the appropriate methods for choice antimicrobial agents.
3. Student will know the diverse methods of sterilization and disinfection and perform microbiology laboratory safety and rules.
4. Student will diagnose the different microbial infection in microbiology laboratory.

2. Teaching mode (mark all that apply)

| No | Mode of Instruction | Contact Hours | Percentage |
|----|--|---------------|------------|
| 1 | Traditional classroom | 60 | 100 |
| 2 | E-learning | | |
| 3 | Hybrid <ul style="list-style-type: none"> • Traditional classroom • E-learning | | |
| 4 | Distance learning | | |



3. Contact Hours (based on the academic semester)

| No | Activity | Contact Hours |
|-------|-------------------|---------------|
| 1. | Lectures | 30 |
| 2. | Laboratory/Studio | 30 |
| 3. | Field | 0 |
| 4. | Tutorial | 0 |
| 5. | Others (specify) | 0 |
| Total | | 60 |

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

| Code | Course Learning Outcomes | Code of CLOs aligned with program | Teaching Strategies | Assessment Methods |
|------|--|-----------------------------------|--|--|
| 1.0 | Knowledge and understanding | | | |
| 1.1 | Demonstrate the concepts and knowledge related to microorganisms and their characteristics | K1 | Lectures Lab work | Written Exams Assignments Practical exams |
| 1.2 | Demonstrate the understanding related to identification of microorganisms | K3 | Lectures Lab work | Written Exams Assignments Practical exams |
| 2.0 | Skills | | | |
| 2.1 | Demonstrate ability to identify the microorganisms through staining and microscopy | S3 | Lectures Lab work Group discussion | Written Exams Assignments Practical Exam |
| 3.0 | Values, autonomy, and responsibility | | | |
| 3.1 | Demonstrate ability to confidence and independent thinking | V4 | Problem-based learning Lectures | Practical Exam Assignments Observation cards |



C. Course Content

| No | List of Topics | Contact Hours |
|---------------------------------|---|---------------|
| 1. | Introduction to Microbiology | 2 |
| 2. | Bacterial structure, physiology and metabolism | 3 |
| 3. | Bacterial genetics | 3 |
| 4. | Antimicrobial agents | 3 |
| 5. | Sterilization and disinfection | 3 |
| 6. | General properties of viruses | 3 |
| 7. | Antiviral agents | 3 |
| 8. | General properties of fungi | 3 |
| 9. | Antifungal drugs | 3 |
| 10. | Introduction to parasitology | 2 |
| 11. | Appropriate therapy for parasitic diseases | 2 |
| | Total | 30 |
| List of Practical Topics | | |
| 1. | Introduction and study of different equipment and processing, e.g., B.O.D. incubator, laminar flow, aseptic hood, autoclave, hot air sterilizer, deep freezer, refrigerator, microscopes used in experimental microbiology. | 3 |
| 2. | Preparation, filling and sterilization of nutrient broth and agar medium | 3 |
| 3. | Preparation and fixing a smear for staining | 3 |
| 4. | Staining methods- Simple, Grams staining and acid-fast staining | 3 |
| 5. | Cultivation of microbes in a liquid nutrient medium and on a solidified medium by streak-plate method | 4 |
| 6. | To estimate the number of colonies forming units of given bacterial sample | 4 |
| 7. | Antibiotic sensitivity testing | 3 |
| 8. | Sterilization of glassware, preparation and sterilization of media. | 3 |
| 9. | REVISION | 4 |
| | Total | 30 |



D. Students Assessment Activities

| No | Assessment Activities * | Assessment timing (in week no) | Percentage of Total Assessment Score |
|-----|-------------------------|--------------------------------|--------------------------------------|
| 1. | Quiz | 4-5 | 10% |
| 2. | Midterm Exam | 7-9 | 20% |
| 3. | Assignments | 15 | 10% |
| ... | Observation card | 15 | 5% |
| | Quiz (Practical) | 12-15 | 5% |
| | Practical Exam | 16 | 10% |
| | Final Exam | 17-19 | 40% |
| | Total | | 100% |

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

| | |
|--------------------------|---|
| Essential References | 1. Medical Microbiology, Jawetz, Melnick and Adelberg's. Latest edition. 2. General Microbiology 7th edition Hans G. Schlege |
| Supportive References | 3. Medical Microbiology, Jawetz, Melnick and Adelberg's. Latest edition. 4. General Microbiology 7th edition Hans G. Schlege. |
| Electronic Materials | 5. https://sdl.edu.sa/SDLPortal/en/Publishers.aspx 6. http://dlaf.nu.edu.sa/en/e-libraries 7. http://www.nu.edu.sa/en/web/deanship-of-libraries-affairs/85 8. http://lib.nu.edu.sa/DigitalLibrary.aspx 9. https://www.journals.elsevier.com/international-journal-of-pharmaceutics/ 10. https://www.journals.elsevier.com/colloids-and-surfaces-b-biointerfaces |
| Other Learning Materials | 11. Computer-based programs/CD, professional standards or regulations and software. |

2. Required Facilities and equipment

| Items | Resources |
|--|---|
| facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.) | Suitable lecture room equipped with data show and internet access Suitable labs equipped with health and safety tools. |
| Technology equipment (projector, smart board, software) | Computer Internet access Data show |



| Items | Resources |
|---|--|
| Other equipment (depending on the nature of the specialty) | Computer Internet access Data show |

F. Assessment of Course Quality

| Assessment Areas/Issues | Assessor | Assessment Methods |
|---|---------------------------------|--------------------|
| Effectiveness of teaching | Students | Indirect |
| Effectiveness of students assessment | Examination committee | Direct |
| Quality of learning resources | Course coordinator and students | Indirect |
| The extent to which CLOs have been achieved | Course coordinator | Direct |
| Other | | |

Assessors (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

G. Specification Approval

| | |
|---------------------------|------------------------------------|
| COUNCIL /COMMITTEE | PHARMACEUTICS DEPARTMENT COMMITTEE |
| REFERENCE NO. | 14460216-1060-00001 |
| DATE | 21/08/2024 |