# Course Specifications

## General Information

| | |
|---|---|
| **Course name** | Introduction to microbiology |
| **Course number** | DENT1205 |
| **Faculty** | |
| **Department** | |
| **Course type** | Major Needs |
| **Course level** | 1 |
| **Credit hours (theoretical)** | 2 |
| **Credit hours (practical)** | 0 |
| **Course Prerequisites** | |

## Course Objectives

1 - Understanding bacterial morphology, structure and growth
2 - Understanding microbial pathogenesis
3 - Understanding modes of transmission of microorganisms
4 - Understanding the normal microbial flora of human body
5 - Understanding the basis of microbial and bacteriophage genetics.
6 - Understanding the mechanism of antimicrobial agents and resistance to antimicrobial drugs
7 - Understanding the concept of immune response
8 - Understanding the vaccines used against common infectious diseases

## Intended Learning Outcomes

| | |
|---|---|
| **Knowledge and Understanding** | * Describe the morphology and structure of microorganisms |
| | * Identify bacterial growth and requirements for microbial growth |
| | * Demonstrate the mechanisms of microbial pathogenesis, modes of transmission and the outcomes of infections |
| | * Describe the characteristics of bacterial and bacteriophage genetics |
| | * Illustrate the basics of antimicrobial uses and resistance |
| | * Describe the host defense mechanisms |
| | * Describe the hypersensitivity reactions types and autoimmunity |
| | * Understand the antigen-antibody reactions |
| **Intellectual Skills** | * The student should recognize the bacterial morphology, growth, genetics, pathogenesis, and treatment |
| | * The student should be able to recognize modes of transmission of microbes and vaccines measures used against common infectious diseases |
| **Professional Skills** | * Perform a Gram stain and a Ziehl-Neelsen stain and identify microorganisms |
| | * The student should be able to identify the modes of the transmission of microbes, prevention by using vaccines and treatment by using antimicrobial drugs. |
| **General Skill** | * Working in team (i.e., sharing presentations and discussions and solving problem). |
| | * Comprehend microbiological and immunological reports |

## Course Contents

1 - Introduction to medical microbiology: domains of living organisms, the binomial nomenclature of microbes, and the impact of microorganisms on all life
2 - Bacterial morphology and structure
3 - Bacterial growth and requirements for microbial growth
4 - Bacterial pathogenesis
5 - Bacteriophage and transfer of genetic information between bacterial cells
6 - Antimicrobial Agents: Mechanism of action and antibiotic resistance
7 - Normal microbial flora of human body
8 - Host defense mechanisms: Natural immunity. and acquired immunity
9 - Antigens and antibodies
10 - Hypersensitivity and autoimmunity
11 - Antigen-Antibody Interactions
12 - Vaccines

## Teaching and Learning Methods

1 - Lectures
2 - Reports
3 - Discussion
4 - Quizzes

## Teaching and Learning Methods for the Disabled Students

1 - Not applicable

## Students Assessment

| Assessment Method | TIME | MARKS |
|---|---|---|
| Quiz 1 | the third week | 10 |
| Quiz 2 | fifth week | 10 |
| Midterm exam | the eighth week | 30 |
| Quiz 3 | the eleventh week | 10 |
| Final exam | the fifteenth week | 40 |

## Books and References

| | |
|---|---|
| Course note | Handouts |
| Essential books | Cowan, M. Kelly& Smith, Heidi. Microbiology: a systems approach 5th edition (2018) |
| Recommended books | Bhatia R & Ichhpujani R. L. Essentials of Medical Microbiology 4th edition (2008) |
| | Levinson, W. Review of Medical Microbiology and Immunology 12th edition (2012) |
| | Gerard J. Tortora, Berdell R. Funke, Christine L. Case. Microbiology: an introduction 10th edition (2010) |

## Knowledge and Skills Matrix

| Main Course Contents | Study Week | Knowledge and Understanding | Intellectual Skills | Professional Skills | General Skill |
|---|---|---|---|---|---|
| Introduction to medical microbiology: domains of living organisms, the binomial nomenclature of microbes, and the impact of microorganisms on all life | First week | Describe the main differences between the three domains of life | The student should recognize the importance of microbes | | Comprehend microbiological reports |
| Bacterial morphology and structure. | Second and Third weeks | Describe the morphology and structure of microorganisms | | Perform a Gram stain and a Ziehl-Neelsen stain and identify microorganisms | Comprehend microbiological reports |
| Bacterial growth and requirements for microbial growth | Fourth week | Identify bacterial growth and requirements for microbial growth | The student should recognize the bacterial growth | | Comprehend microbiological reports |
| Bacterial pathogenesis | Fifth week | Demonstrate the mechanisms of microbial pathogenesis, modes of transmission and the outcomes of infections. | | The student should be able to identify the modes of the transmission of microbes | Comprehend microbiological reports |
| Bacteriophage and transfer of genetic information between bacterial cells | Sixth and Seventh weeks | Describe the characteristics of bacterial and bacteriophage genetics | | The student should be able to identify transfer of genetic information between bacterial cells | Comprehend microbiological reports |
| Antimicrobial Agents: Mechanism of action and antibiotic resistance. | Eighth week | Illustrate the basics of antimicrobial uses and resistance | | | Comprehend microbiological reports |
| Normal microbial flora of human body. | Ninth week | Identify the normal flora of human body | | | Comprehend microbiological reports |
| Host defense mechanisms:Natural immunity and acquired immunity | Tenth week | Describe the natural and acquired immunity | | | Comprehend immunological reports |
| Antigens and antibodies | Eleventh week | Illustrate the differences between types of antibodies | | | Comprehend immunological reports |
| Hypersensitivity and autoimmunity | Twelfth week | Describe the hypersensitivity reactions types and autoimmunity | | | Comprehend immunological reports |

| | | | | | |
|---|---|---|---|---|---|
| Antigen-Antibody Interactions | Thirteenth week | Understand the antigen-antibody reactions | | The student should be able to diagnose some infectious diseases on the bases of antigen and antibody reactions | Comprehend immunological reports |
| Vaccines | Fourteenth week | Identify the most common vaccines | The student should be able to recognize vaccines measures used against common infectious diseases. | The student should be able to identify the prevention of diseases by using vaccines | Comprehend microbiological and immunological reports |