



University of Nicosia, Cyprus

Course Code BIOL-251	Course Title Introduction to Microbiology and Virology	ECTS Credits 6
Department Life and Health Sciences	Semester Spring/Fall	Prerequisites BIOL-101 and 102 General Biology I and II
Type of Course Required	Field Biology, Microbiology	Language of Instruction English
Level of Course 1 st Cycle	Year of Study 2nd	Lecturer Dr. Krashias George
Mode of Delivery face-to-face	Work Placement N/A	Co-requisites None

Objectives of the Course:

This course aims to help students understand infectious diseases through the study of the general microbiology concepts of structure, growth and metabolism of microorganisms and viruses and their interrelationship with humans. The course also aims to train students in standard microbiology techniques utilized on a daily basis in laboratories. The main objectives of the course are to:

- Make students aware of the appropriate terminology in the fields of studying microorganisms and viruses.
- Introduce the processes of infection of opportunistic and pathogenic microorganisms and the body's defense systems.
- Present the basic principles for the prevention and control of infections by microorganisms.
- Enable students to make informed decisions on health and hygiene regarding infectious diseases.
- Provide the opportunity to practice in microbiology laboratory techniques and to draw and report appropriate conclusions from the analysis of experimental data.

Learning Outcomes:

After completion of the course students are expected to be able to:

1. Identify fungal, protozoan and parasitic pathogens and their role in diseases.
2. Classify the major groups of bacteria and viruses and distinguish their structural differences, processes of growth and mechanisms of infection.
3. Apply the understanding of the body's immune responses to the process of infection by pathogens and to the strategies used for prevention and control of infectious diseases.
4. Distinguish between bacteriostatic and bactericidal antibiotics and their effect on the

- growth of microorganisms.
5. Describe the physical and chemical methods used to identify microorganisms and to control their growth, and apply this understanding to scenarios for prevention of transmission and control of infectious diseases.
 6. Evaluate the cause and effect of major diseases (i.e. HIV and AIDS , hepatitis, tuberculosis)
 7. Demonstrate appropriate laboratory skills on applying microbiology techniques.

Course Contents:

1. Human and the Microbial World. Microscopy, Cell Structure and Function
Lab: Ubiquity of Microorganisms
2. Principles of Prokaryotic Growth. Control of Microbial Growth
Lab: Pure Culture and Aseptic Technique
3. Metabolism: Fuelling Cell Growth
Lab: Bright-Field Microscopy
4. Diversity of Prokaryotes
Lab: Anti-Microbial Properties of Plants
5. Bacterial Genetics.
Lab: Cell Staining
6. Viruses of Bacteria, Viruses of Animals and Plants
Lab: Quantification of Microorganisms
7. Fungal, protozoan and paracitic pathogens;
Lab: Antiseptics, Disinfectants, and Antibiotics
8. Mechanisms of viral infections
Lab: Chemically Defined, Complex, Selective, and Differential Media
9. Bacterial and viral infection and the immune system;
Lab: Effects of Incubation temperatures on Generation Time
10. Antimicrobial and antiviral vaccines;
Lab: Effect of Ultraviolet Light on Microbial Growth.
11. Major diseases in humans: HIV and AIDS, tuberculosis, hepatites
Lab: Video Demonstration: Tumor viruses, cancer and viral diseases
12. Antimicrobial medication; microbial drug resistance
Lab: Case studies presentations

Learning Activities and Teaching Methods:

Lectures; Laboratory Sessions/Demonstration/Tutorials; Slide/Video presentations; Cooperative learning activities.

Assessment Methods:

Laboratory reports; Assignments; Quizzes and Mid-term Exam; Final Exam

Required Textbooks/Reading:

Authors	Title	Publisher	Year	ISBN
E. W. Nester et al.	Microbiology; a human perspective	McGraw-Hill	2009 6th ed	978-007-127039-7
John Kleyn and Mary Bicknell	Microbiology Experiments A Health Science Perspective	McGraw-Hill Science Engineering	2009 6th ed	9780072999495

Recommended Textbooks/Reading:

Authors	Title	Publisher	Year	ISBN
M. Wilson, R. McNab, B. Henders	Bacterial Disease Mechanisms : An Introduction to Cellular Microbiology	Cambridge University Press	2002, 1 st ed.	0521792509
Tortora, Funke, Case	Microbiology An Introduction	Pearson International	2010 10 th ed.	0321396022
Bruce A. Voyles	The Biology of Viruses	McGraw-Hill	2001, 2 nd ed.	0072370319
Abigail A. Salyers, Dixie D. Whitt	Microbiology: Diversity, Disease, and the Environment	Wiley	2001	1891786016
A. Easton, K. Leppard, N.J. Dimmock	Introduction to Modern Virology	Blackwell Publishers	2007, 6 th ed.	063205509X
John Kleyn, Mary Bicknell,	Microbiology Experiments: A Health Science Perspective	McGraw-Hill	2003, 4 th ed.	1405136456