Global Learning Semesters
Course Syllabus
Course: BIOL-205 Introduction to Microbiology and Virology
Department: Health and Life Sciences
Host Institution: University of Nicosia, Nicosia, Cyprus

Course Summary		
Course Code	**Course Title**	**Recommended Credit Hours**
BIOL-205	Introduction To Microbiology And Virology	4
Semester Offered	**Contact Hours**	**Prerequisites**
Please contact us	42-45	BIOL -101, BIOL -102
Department	**Level of Course**	**Language of Instruction**
Health and Life Sciences	Lower Division	English

Course Description

The student in this course will learn first about the molecular and cellular interactions that occur between ourselves and the bacteria that live with us, both in times of health and during infections. The student will learn how through these interactions bacteria and host evade and overcome one another's offensive and defensive mechanisms. The course will also cover microorganisms related to other diseases like fungal, protozoan and paracitic diseases. The second part of the course will cover the study of human viruses (DNA and RNA) their structure and their mechanisms for virus cell entry, replication, gene expression and lysogeny; their role in carcinogenesis and the body defense mechanisms in viral infection. Prevention and therapy and emerging viruses receive special attention and include the major infectious challenges posed by HIV, pandemic influenza, and BSE.

At the end of the course the student will be able to: Know many of the disease-causing microorganisms; Appreciate the challenge of microorganisms to the human body and how the body responds; Understand the relationship between host, agent and environment in the transmission of infectious diseases. Understand some of the uses, misuses, advantages and limitations of antimicrobe drugs. The course format will be 3h/week lectures, assigned readings and 3h/week laboratory experiments.

Prerequisites

BIOL -101, BIOL -102

Topic Areas

1. Introduction: Infection and disease; normal bacterial flora
2. Basic cell biology and biochemistry of bacteria growth and genetic aspects of bacterial virulence
3. Bacterial-human cell communication in infection; bacterial adhesion, invation as a virulence mechanism
4. The mucosal surface and antibacterial defence; bacterial exotoxins; evasion of host defence mechanisms
5. Immune defence against bacteria
6. Nosocomial and sexually transmitted bacterial diseases
7. Fungal, protozoan and paracitic pathogens
8. Viruses (structure and viral nucleic acids); Viral diseases (hepatitis, skin diseases)
9. The process of viral infection: DNA and RNA viruses, viral replication, gene expression, assembly, lytic and lysogenic replication
10. The immune system: virus neutralization, interferon
11. Vaccines and antiviral drugs

12. Tumor viruses, cancer and viral diseases
13. Viruses evolution; HIV and the Acquired Immune Deficiency syndrome (AIDS)
14. Prion diseases

Laboratory Exercises

3 hours/week, The laboratory sessions will include hands on experiments and demonstrations/discussions using CD and slide/video presentations.

1. Determination of Cell Motility, Form, and Viability Using Wet Mount and Hanging Drop Preparations
2. Simple Stains: Positive and Negative Stains
3. Multiple and Differential Stains
4. Pure Culture and Aseptic Technique
5. Defined, Undefined, Selective and Differential Media
6. Quantification of Microorganisms
7. The Effect of Incubation Temperature on Generation Time
8. Control of Microbial Growth with Ultraviolet Light
9. Antiseptics and Antibiotics
10. Selection of Bacterial Mutants Resistant to Antibiotics
11. Transformation: A Form of Genetic Recombination
12. Microscopic Identification of Fungi and parasites
13. Skin Flora and Respiratory Microorganisms
14. Hepatites viruses: types and methods of identifications

Readings and Resources

Required Textbooks

1. Bacterial Disease Mechanisms : An Introduction to Cellular Microbiology
   by Michael Wilson, Rod McNab, Brian Henderson Publisher: Cambridge University Press; 1st edition (May 15, 2002) ISBN: 0521792509
2. Introduction to Modern Virology by N. J. Dimmock, Andrew Easton, Keith Leppard, Nigel J. Dimmock Publisher: Blackwell Publishers; 5th edition (December 15, 2001) ISBN: 063205509X
3. Microbiology Experiments A Health Science Perspective, Fourth Edition Authors: John Kleyn, Mary Bicknell, Publishers: McGrow-Hill, 2003, ISBN:0-07-247624-9

Recommended Textbooks

1. Principles of Virology: Molecular Biology, Pathogenesis, and Control
   by S. J. Flint et. al. 2000. ASM Press. ISBN 1-55581-127-2
2. THE BIOLOGY OF VIRUSES, Second Edition by Bruce A. Voyles, Grinnell College Publishers: McGrow-Hill, 2001, ISBN: 0-07-237031-9
3. Fundamentals of Microbiology by I. Edward, Ph.D. Alcamo Jones & Bartlett Pub; ISBN: 0763710679; 6th edition (January 15, 2001)
4. Bacterial Disease Mechanisms : An Introduction to Cellular Microbiology
   by Michael Wilson, Rod McNab, Brian Henderson Publisher: Cambridge University Press; 1st edition (May 15, 2002) ISBN: 0521792509
5. Principles of Virology: Molecular Biology, Pathogenesis, and Control
   by S. Jane Flint (Editor), L. W. Enquist, S.J. Flint, R. M. Krug, A. M. Skalka, V. R. Racaniello, Jane S. Flint, Vincent R. Racaniello, Robert Krug Publisher: Amer Society for Microbiology; 1 edition (December 1999) ISBN: 1555811272
6. Fungal Infections of the Skin & Nail by Suhonen Dunitz Martin Ltd; ISBN: 185317632X; (December 1998)
7. Viruses and Human Disease by James H. Strauss, Ellen G. Strauss Academic Press; ISBN: 0126730504; 1st edition (December 2001)
8. The Coming Plague: Newly emerging diseases in a world out of Balance
   By Laurie Garrett Paperback Publisher: Penguin USA; (October 1995)
   ISBN: 0140250913; Reprint edition
9. The Hot Zone By Richard Preston. (August 1995) Paperback Publisher: Anchor; ISBN: 0385479565

10. Mims' Pathogenesis of Infectious Disease by Cedric A. Mims, Anthony Nash, John Stephen Academic Press; ISBN: 0124982654; 5th edition (January 15, 2001)
11. Infectious Disease by Barbara Bannister, Norman T. Begg, Stephen Gillespie Blackwell Science Inc; ISBN: 0632053194; 2nd edition (August 15, 2000)
12. Control of Communicable Diseases Manual by James E. Chin (Editor) American Public Health Association; ISBN: 087553242X; 17th edition (January 15, 2000)
13. Scourge: The Once and Future Threat of Smallpox by Jonathan B. Tucker. (September 2, 2001) Atlantic Monthly Pres; ISBN: 0871138301 Paperback
14. Introduction to Modern Virology by N. J. Dimmock, Andrew Easton, Keith Leppard, Nigel J. Dimmock Publisher: Blackwell Publishers; 5th edition (December 15, 2001) ISBN: 063205509X
15. Viral Hepatitis: Molecular Biology, Diagnosis, Epidemiology, and Control (Perspectives in Medical Virology Series) by Isa K. Mushahwar, I. K. MUSHAHWAR Publisher: Elsevier Science Pub Co (December 1, 2003) ISBN: 0444514872