



MICROBIOLOGY

Revised 1/3/11

C - L - CR
3 - 1 - 4

Course Number:

BIO 225
CLASSROOM B4
LAB B1
INSTRUCTORS DR. BRANDON KINLEY 592-4286
AND DR. BERTA HOPKINS 592-4262
OFFICE C-13 (KINLEY) AND E-7 (HOPKINS)

Prerequisite(s):

BIO 210 & 211, BIO 215 & 216, or BIO 101 & 102

Co-requisite(s):

None

Course Description:

A detailed study of microbiology as it relates to infection and disease processes of the body. Topics include immunity, epidemiology, medically important microorganisms and diagnostic procedures for identification.

Course Outcomes:

Students who complete the general education core curriculum should be able to demonstrate

1. rationality, logic, and coherence, through critical thinking
2. their ability to express themselves effectively in quantitative and qualitative terms
3. the scientific method of inquiry
4. their ability to access, retrieve, synthesize, and evaluate information.

Textbook(s):

Cowan. *Microbiology A Systems Approach* 3^d Ed. McGraw Hill, 2011. ISBN 978-0-07-352252-4

Chase, B. *Laboratory Applications in Microbiology A Case Study Approach*. McGraw Hill, 2009. (This manual has been modified specifically for this class and is only available through the SCC bookstore)

Reference(s):

N/A

Other Required Materials, Tools, and Equipment:

All lecture notes will be provided to the students by the instructor. Safety goggles are provided but student is free to bring their own.

Method of Instruction:

Lecture – primary mode of instruction is lecture-style augmented with PowerPoint presentations, hand-outs, audio-visual aids, case studies, and information from media and journals.

Laboratory – individual and small-group instructor guided exercises to reinforce, extend on, and present material not presented in lecture.

Grading System:

90 - 100 = A
80 - 89 = B
79 - 70 = C
69 - 60 = D
Below - 60 = F

Grade Calculation Method:

LECTURE: = 40%
4 Exams: 100 points each
LABORATORY: = 40%
3 Exams: 100 points each
1 Unknown with Report: 100 points
FINAL EXAM = 20%
200 points = 100%

Attendance Policy:

See Student Handbook Pages 77-80
The withdrawal date for Fall semester will be 11/1/11.

Classroom Conduct:

ACADEMIC DISHONESTY

Please See Student Handbook Page 98

CELLULAR PHONES, PAGERS/BEEPERS

Please See Student Handbook Pages 76-77

**Class/Lab
Procedures:**

Biology requires no one miss over 10 hours of lecture.

Preparation:

1. Read over the material before coming to class.
2. Come prepared to do the work each day.
3. Be in your place with lecture notes at the beginning of each class period.
4. Pay careful attention to the printed instructions.
5. Be considerate of your class associates. Your activities may disturb them so they are unable to benefit from the lecture.
6. Report immediately to the instructor any emergencies or injuries that occur.
7. Safety goggles and gloves must be worn at all times in lab
8. No food or drink will be allowed into the lab

Accommodations:

Students who need special accommodations in this class because of a documented disability should notify Student Disability Services by calling (864) 592-4818, toll-free 1-800-922-3679; via email through the SCC web site at www.sccsc.edu/resources/disabilities; or by visiting the office located in the East Building Room 30-B on the SCC Central campus. Contacting Student Disability Services early in the semester gives the College an opportunity to provide necessary support services and appropriate accommodations.

**Course Outcomes
and Objectives:**

Lecture specific outcomes

1. Describe the relationship between microbes and humans and the importance of microbes on the world. State names of selected microbiology investigators and the contribution(s) each made to Microbiology.
2. Describe the functional anatomy of prokaryotic cells eukaryotic cells and state function of each cellular organelle. Describe viral anatomy, modes of multiplication and cultivating techniques. State the classification schemes used for Prokaryotes, Eukaryotes and Viruses.
3. Define bacterial growth and describe a typical growth curve.
4. Describe the various ways growth of bacteria is measured
5. State the various physical and chemical factors important in the growth of bacteria.
6. State the differences between and the reasons for employing various culture media.
7. Describe the various chemical and physical means of

- controlling bacterial growth.
8. Describe microbial metabolism to include enzyme function, energy production (including aerobic and anaerobic respiration) and anabolism.
 9. State the importance of DNA with understanding of transcription and translation and mutations. Describe recombinant events and use of genetically modified organisms.
 10. Describe the various principles and factors relating to disease and epidemiology.
 11. State and describe the various microbial methods of pathogenicity.
 12. State, understand and define the various nonspecific and specific defense mechanisms
 13. State and define the practical applications of immunology. Define the disorders of the immune systems.
 14. For diseases of the various body systems:
 - a. state the causative microbial agent of each disease and its characteristics.
 - b. the symptoms of the disease and how it is contracted
 - c. the recommended treatment protocol.

Laboratory specific outcomes:

1. State and observe the safety precautions of the Microbiology laboratory.
2. Identify the parts, and state their functions, of the microscope. Also, describe how magnification is calculated and be able to do so when given the necessary information.
3. Define, demonstrate and use aseptic technique.
4. Describe and perform the various simple and differential staining procedures and define selected terms relating thereto.
5. Describe ways of measuring bacterial growth and calculate generation time and growth rate when given the necessary information.
6. Identify the results obtained when various bacteria are grown on various chemical, selective and differential media and state the reasons for the results and define selected terms relating thereto.
7. Define, "epidemiology" and illustrate epidemiological techniques and define selected terms relating thereto.
8. State selected identification methods, describe each and explain the results that may be obtained using each.
9. Follow a staining, cultural and growth protocol, and be able to identify unknown bacteria.
10. Using microscope slides and/or photographs identify

various pathogenic protists and helminths and define selected terms relating thereto.