



MICROBIOLOGY (BIOLOGY 225)

Date 8/10/10

C - L - CR
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COURSE NUMBER: Biology 225

PREREQUISITE(S): Biology 210, 211 or Biology 101, 102

CO-REQUISITE(S): None

COURSE DESCRIPTIONS

This course provides a detailed study of microbiology in which the relationships between humans and microorganisms with respect to human health are examined. Topics covered include cellular structure, control of growth of microorganisms, immunity and immune deficiencies, and human disease processes caused by microorganisms. Also covered are principles of epidemiology, medically important microorganisms, the diseases they cause, and diagnostic procedures for identification.

TEXTBOOK(S): **Microbiology, A Systems Approach, Second Edition** by Cowan and Talaro.; Published by McGraw Hill 2009

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

REFERENCE(S): Library and Internet Resources

OTHER REQUIRED MATERIALS, TOOLS, AND EQUIPMENT: **Safety goggles, Sharpie felt tip pens,** other appropriate school supplies

GENERAL EDUCATION 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 written and oral communication
3. their ability to express themselves effectively in quantitative and qualitative terms
4. the scientific method of inquiry
5. their ability to access, retrieve, synthesize, and evaluate information.

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:

Attendance: The student is responsible for punctual and regular attendance in all classes, laboratories, clinical, practical, internships, field trips, and other required class activities.

The College does not grant excused absences; therefore, students are urged to reserve their absences for emergencies.

When illness or other emergencies occur, the student is responsible for notifying instructors and completing missed work if approved for late submission by instructors.

The student is tardy if not in class at the time the class is scheduled to begin and is admitted to class at the discretion of the instructor.

Instructors maintain attendance records. However, it is the **student's responsibility to withdraw from a course.** A student enrolling in and attending at least one course session remains enrolled until the student initiates a withdrawal.

Withdrawal Policy: During the first 75% of the course, a student may initiate withdrawal and receive a grade of W. A student cannot initiate a withdrawal during the last 25% of the course. Extenuating circumstances require documentation and approval by the appropriate department head and academic dean.

**ATTENDANCE
POLICY:**

Absences for Religious Holidays: Students who are absent from class in order to observe religious holidays are responsible for the content of any activities missed and for the completion of assignments occurring during the period of absence. Students who anticipate their observance of religious holidays will cause them to be absent from class and do not wish such absences to penalize their status in class should adhere to the following guidelines:

1. Observance of religious holidays resulting in three or fewer consecutive absences: Discuss the situation with the instructor and provide written notice at least one week prior to the absence(s). Develop (in writing) and instructor-approved plan which outlines the make up of activities and assignments.
2. Observances of religious holidays resulting in four or more consecutive absences: Discuss the situation with the instructor and provide the instructor with written notice within the first 10 days of the academic term. Develop an instructor-approved plan with outlines the make up of activities and assignments.

**CLASSROOM
CONDUCT:**

ACADEMIC DISHONESTY: Students are expected to uphold the integrity of the College's standard of conduct, specifically in regards to academic honesty. All forms of academic dishonesty including, but not limited to, cheating on assignments/tests, plagiarism, collusion, and falsification of information will call for disciplinary action. Disciplinary action imposed may include one or more of the following: written reprimand, loss of credit for assignment/test, termination from course, and probation, suspension, or expulsion from the College. For further explanation of this and other conduct codes, please refer to the Student Handbook.

CELLULAR PHONES, PAGERS/BEEPERS: Cellular phones, pagers and beepers are **not permitted** to be turned on or used within the classroom. Use of these devices during classroom time will be considered a violation of the student code as it relates to "disruptive behavior."

**CLASS/LAB
PROCEDURES:**

LABORATORY: Practicals will include information presented in the laboratory exercises and objectives. No make-up laboratory practicals will be given without discussion with the Instructor prior to or on the date of the scheduled practical.

UNKNOWN: Each student will receive a culture of bacteria. Each bacterium must be isolated, and identified using techniques learned in lecture and laboratory. Once correctly identified a

**CLASS/LAB
PROCEDURES:**

separate report must be submitted containing the identity of the bacteria and detailing the various operations performed leading to its identification, including a complete flow chart.

SAFETY: Safety goggles must be worn at all times while dealing with microbes in laboratory. Footwear that completely covers the foot. Students without safety goggles or with improper footwear will not be allowed to stay in the lab.

THERE ARE NO PROVISIONS FOR EXTRA CREDIT WORK OR ACTIVITIES.

GENERAL: Students are expected to be respectful and considerate of the various learning styles and preferences of their fellow students and of the instructor. Rude, inconsiderate behavior will not be tolerated. Students sleeping in class or lab or being disruptive in any way will be asked to leave the room and an absence will be assigned.

Students are not to leave after ten or fifteen minutes of the instructor being late for class. If the instructor is not able to attend class a substitute instructor will be assigned for that period.

No food or drinks allowed in the laboratory work area. Lab desks must also be kept clear of coats, sweaters, purses, extra books or anything else that may cause lab accidents.

Lab accidents should be immediately reported to the instructor.

All students are required to sign and date the "Statement of Receipt of Syllabus and Acceptance of Policies". Signed and dated statements will be filed with the Department Head.

ACCOMMODATIONS:

Students who need special accommodations in this class because of a documented disability should notify Student Disability Services. You may contact Student Disability Services by calling, (864) 592-4811, toll-free 1-800-922-3679; via email through the Spartanburg Community College web site at www.sccsc.edu/SDS/; or by visiting the office located in the Dan Lee Terhune Student Services Building, room 112 of the Spartanburg Community College campus. By contacting Student Disability Services early in the semester, students with disabilities give the College an opportunity to provide necessary support services and appropriate accommodations.

**COURSE OUTCOMES
& OBJECTIVES:**

Lecture specific outcomes

1. Describe the relationship between microbes and humans and the importances 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.

**COURSE OUTCOMES
& OBJECTIVES:**

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.