

Murray State University

Revised 7/28/15

DEPARTMENT: Biological Sciences

COURSE PREFIX: BIO COURSE NUMBER: 300

CREDIT HOURS: 4

I. TITLE: Introductory Microbiology

II. COURSE DESCRIPTION AND PREREQUISITE(S): An introductory survey of general microbiology. Special emphasis is given to the study of the prokaryote microorganisms both in laboratory and lecture. Three hours of lecture and three hours of laboratory per week.

Prerequisite(s): eight hours of chemistry and eight hours of biology

III. COURSE OBJECTIVES:

The student will be able to

- A.** to provide a general understanding of the activities of microorganisms and their importance to man and his environment;
- B.** each student should gain an appreciation and understanding of aseptic technique and how microorganisms are controlled in the clinical setting; and
- C.** describe the processes of disease, immunity, and host parasite relationships.

IV. CONTENT OUTLINE:

Introduction and History of Microbiology	Chapter 1
Biochemistry	Chapter 2
Cell Structure	Chapter 3
Microbial Growth and Control	Chapter 4 and 5
Metabolism	Chapter 6
Exam 1	
Molecular Biology of Prokaryotes	Chapter 7
Bacterial Genetics	Chapter 8
Viruses	Chapter 13
Autotrophy and N ₂ Fixation	Notes
Exam 2	
Innate Immunity	Chapter 14
Adaptive Immunity	Chapter 15
Host-Microbe Interactions	Chapter 16
Applied Immunology	Notes
Epidemiology	Chapter 19
Antimicrobial Medications	Chapter 20
Exam 3	

V. INSTRUCTIONAL ACTIVITIES:

The course includes a detailed study of bacteria and general areas of discussion will be concerned with principles of bacteriology (culture, physiology, anatomy, genetics),

control of microorganisms through chemical and physical methods, principles of infection and immunity, and specific diseases caused by microorganisms. The laboratory provides practical experience in aseptic technique, bacterial culture, and identification of unknown species.

VI. FIELD, CLINICAL, AND/OR LABORATORY EXPERIENCES:

Laboratory Topics

Week

- A.** Check in, Exercise 1: Ubiquity of Microorganisms and Aseptic Technique
- B.** Exercise 2: Normal Flora and Streaking Technique
- C.** Exercise 3: Selective and Differential Media
- D.** Exercise 4: Introduction to the Brightfield Microscope
Exercise 5: Gram Stain
- E.** Exercise 6: more Gram Stain and Gram Staining Unknown Organisms
- F.** Exercise 8: Growth Curve and the Effects of Antibiotics
- G.** Lab Report 1 Due Wednesday, Friday is Fall Break
- H.** Exercise 9: Kirby Bauer and Filter Paper Disk Technique
- I.** Exercise 10: Differential Metabolism
- J.** API Rapid Identification of Unknowns
- K.** Isolation of *E. coli* from Environmental Samples
- L.** Quantitation of Ampicillin Resistant *E. coli*
Plasmid Isolation
- M.** Gel Electrophoresis of Plasmid DNA
Transformation of Laboratory Strains of *E. coli* with Purified Plasmid
- N.** Lab Report Due on Wednesday
Laboratory Final Exam

VII. TEXT(S) AND RESOURCES:

Microbiology, A Human Perspective. 7th edition. Nester Anderson and Roberts.
McGraw Hill Publish.

Lab Manual: Lab exercises will be available on Canvas.

VIII. EVALUATION AND GRADING PROCEDURES:

There will be 3 midterm exams worth 150 points each. The Laboratory portion of the course will be worth 150 points. Your grade will be determined on a straight scale- 90% or 540 points is an A, 80% or 480 points is a B, 70% or 420 points is a C and 60% or 360 points is a D. Anything less than 360 points will earn a failing grade. **There will be no opportunity for extra credit given in this course.** The final exam is optional and will be comprehensive with 100 multiple choice questions. You can raise your grade one letter by scoring one (or more) grade higher on the final than your semester average. **With a good lab score and a decent score on exams you have no need of extra credit so put your effort into the exams and the laboratory.** The laboratory portion of the course is very important, yet despite the 150 points offered in lab some students have chosen to be absent from lab repeatedly. For that reason, **if you have more than one unexcused absences from lab you will receive an E for the entire course.**

IX. ATTENDANCE POLICY:

Students are expected to adhere to the MSU Attendance Policy outlined in the current *MSU Bulletin*.

Lecture attendance is required since some of the material covered in class cannot be found in the same detail in the textbook. Role, however, will not be taken. Make-up exams will not be given except for well-verified excused absences. The instructor must be notified in advance of the examination day, if at all possible, when an absence is unavoidable. Laboratory attendance is mandatory and an unexcused absence will result in a 30 point deduction. Two (2) unexcused absences from lab will result in a grade of E for the course.

X. ACADEMIC HONESTY POLICY:

Murray State University takes seriously its moral and educational obligation to maintain high standards of academic honesty and ethical behavior. Instructors are expected to evaluate students' academic achievements accurately, as well as ascertain that work submitted by students is authentic and the result of their own efforts, and consistent with established academic standards. Students are obligated to respect and abide by the basic standards of personal and professional integrity.

Violations of Academic Honesty include:

Cheating - Intentionally using or attempting to use unauthorized information such as books, notes, study aids, or other electronic, online, or digital devices in any academic exercise; as well as unauthorized communication of information by any means to or from others during any academic exercise.

Fabrication and Falsification - Intentional alteration or invention of any information or citation in an academic exercise. Falsification involves changing information whereas fabrication involves inventing or counterfeiting information.

Multiple Submission - The submission of substantial portions of the same academic work, including oral reports, for credit more than once without authorization from the instructor.

Plagiarism - Intentionally or knowingly representing the words, ideas, creative work, or data of someone else as one's own in any academic exercise, without due and proper acknowledgement.

Instructors should outline their expectations that may go beyond the scope of this policy at the beginning of each course and identify such expectations and restrictions in the course syllabus. When an instructor receives evidence, either directly or indirectly, of academic dishonesty, he or she should investigate the instance. The faculty member should then take appropriate disciplinary action.

Disciplinary action may include, but is not limited to the following:

- 1) Requiring the student(s) to repeat the exercise or do additional related exercise(s).
- 2) Lowering the grade or failing the student(s) on the particular exercise(s) involved.
- 3) Lowering the grade or failing the student(s) in the course.

If the disciplinary action results in the awarding of a grade of E in the course, the student(s) may not drop the course.

Faculty reserve the right to invalidate any exercise or other evaluative measures if substantial evidence exists that the integrity of the exercise has been compromised. Faculty also reserve the right to document in the course syllabi further academic honesty policy elements related to the individual disciplines.

A student may appeal the decision of the faculty member with the department chair in writing within five working days. Note: If, at any point in this process, the student alleges that actions have taken place that may be in violation of the Murray State University Non-Discrimination Statement, this process must be suspended and the matter be directed to the Office of Institutional Diversity, Equity and Access. Any appeal will be forwarded to the appropriate university committee as determined by the Provost.

XI. NON-DISCRIMINATION POLICY AND STUDENTS WITH DISABILITIES:

Policy Statement

Murray State University endorses the intent of all federal and state laws created to prohibit discrimination. Murray State University does not discriminate on the basis of race, color, national origin, gender, sexual orientation, religion, age, veteran status, or disability in employment, admissions, or the provision of services and provides, upon request, reasonable accommodation including auxiliary aids and services necessary to afford individuals with disabilities equal access to participate in all programs and activities. For more information, contact the Executive Director of Institutional Diversity, Equity and Access, 103 Wells Hall, (270) 809-3155 (voice), (270) 809-3361 (TDD).

Students with Disabilities

Students requiring special assistance due to a disability should visit the Office of Student Disability Services immediately for assistance with accommodations. For more information, students should contact the Office of Student Disability Services, 423 Wells Hall, Murray, KY 42071. 270-809-2018 (voice) 270-809-5889(TDD).