SYLLABUS

DATE OF LAST REVIEW 02/2013

CIP CODE: 24.0101

SEMESTER: DEPARTMENTAL SYLLABUS

COURSE TITLE: Microbiology Laboratory

COURSE NUMBER: BIOL-0262

CREDIT HOURS: Two (2)

INSTRUCTOR: DEPARTMENTAL SYLLABUS

OFFICE LOCATION: DEPARTMENTAL SYLLABUS

OFFICE HOURS: DEPARTMENTAL SYLLABUS

TELEPHONE: DEPARTMENTAL SYLLABUS

EMAIL: DEPARTMENTAL SYLLABUS

KCKCC issued email accounts are the official means for electronically communicating with our students

PREREQUISITES: Any one of the following will serve as the prerequisite for this course: CHEM0109, General Chemistry and Lab, or CHEM0111, College Chemistry I and Lab, or BIOL0121 General Biology; or BIOL0271 Physiology. In addition, BIOL0261, Microbiology is a co-requisite or prerequisite.

REQUIRED TEXT AND MATERIALS: Please check with the KCKCC bookstore, http://www.kckccbookstore.com. For the required texts for your particular class.

COURSE DESCRIPTION: Using scientific procedures and diagnostic techniques, students investigate and perform laboratory work dealing with pathogenic and non-pathogenic microbes.

METHOD OF INSTRUCTION: A variety of instructional methods may be used depending on content area. These include but are not limited to: lecture, multimedia, cooperative/collaborative learning, labs and demonstrations, projects and presentations, speeches, debates, and panels, conferencing, performances, and learning experiences outside the classroom. Methodology will be selected to best meet student needs.

COURSE OUTLINE:

I. Microscopy
   A. Parts of the medical grade compound light microscope
   B. Proper care of the microscope
   C. Resolution Power
   D. Refractive Index
   E. Magnification of Objective lenses
   F. Total Magnification
   G. Depth of Field
   H. Parfocalization
   I. Other types of microscopes
II. White Blood Cell Counts
   A. Identify erythrocytes
   B. Identify thrombocytes
   C. Identify five types of leukocytes and count 50

III. Bacterial Morphology
   A. Identify and draw two types of cocci arrangement morphologies
   B. Identify and draw two types of bacilli arrangement morphologies
   C. Identify and draw two types of spirilla

IV. Environmental Study - Pond Water
   A. Identify and draw various types of protozoans - relation to sustainability

V. Bacterial Stains
   A. Gram Stain
   B. Endospore Stain
   C. Capsule Stain
   D. Acid Fast Stain
   E. Cell Wall Stain
   F. Simple Stain of cheek epithelial cells

VI. Bacterial Cultures
   A. Aseptic Technique
   B. Streak Plating on nutrient agar
   C. Colony Characteristics

VII Practical Application in Microbiology
   A. Milk Dilution Assay
   B. Pharmacological Agents
   C. Ultraviolet Light
   D. Disinfectants
   E. Indoor environmental study of bacteria – relation to sustainability
   F. Determination of Bacterial Unknown
   G. Transformation with *Escherichia coli*

VIII. Biochemical Testing of Bacteria
   A. Blood Agar
   B. MacConkeys agar
   C. Mannitol Salts agar
   D. Eosin Methylene Blue agar
   E. Triple Sugar Iron agar
   F. Urease Test
   G. Indole Test
   H. Hydrogen Sulfide
   I. Motility
   J. Nitrate Test as related to recycling nutrients & sustainability
   K. Methyl Red test
   L. Citrate utilization

EXPECTED LEARNER OUTCOMES:
   A. The student will be able to focus a microscope on low-power and high-power
   B. The student will be able to focus a microscope using oil immersion.
   C. The student will be able to microscopically identify three types of bacterial morphology.
   D. The student will be able to microscopically identify microorganisms in pond water.
   E. The student will be able to conduct various bacterial stain procedures and identify microscopically.
   F. The student will be able to isolate pure cultures of bacteria on nutrient agar.
   G. The student will be able to conduct experiments used in applied workplace microbiology.
   H. The student will be able to perform biochemical tests used to identify bacteria.
MICROBIOLOGY COURSE COMPETENCIES:

The student will be able to focus a microscope on low-power and high-power
1. The student will be able to identify and properly use all parts of a medical grade microscope.
2. The student will be able to calculate the resolving power of each objective lens.
3. The student will be able to calculate the total magnification of each objective lens.
The student will be able to focus a microscope using oil immersion.
4. The student will be able to focus, identify and perform a leukocyte count.
5. The student will be able to focus and identify erythrocytes and thrombocytes in blood.
The student will be able to microscopically identify three types of bacterial morphology.
6. The student will be able to focus and identify two species of cocci.
7. The student will be able to focus and identify two species of bacilli
8. The student will be able to focus and identify two species of spirilla.
The student will be able to microscopically identify microorganisms in pond water.
9. The student will be able to identify protozoans in pond water and relate to sustainability.
The student will be able to conduct various bacterial stain procedures and identify microscopically.
10. The student will be able to perform a Gram stain and identify E.coli and Staphylococci.
11. The student will be able to perform an endospore stain and identify using Baccilus subtilis.
12. The student will be able to perform a capsule Stain and identify using Klebsiella pneumonia.
The student will be able to isolate pure cultures of bacteria on nutrient agar.
13. The student will be able to perform the streak plate technique for isolating bacteria.
14. The student will be able to describe unique colony characteristics of bacteria.
The student will be able to conduct experiments used in applied workplace microbiology.
15. The student will be able to determine the antibiotic of choice using the Kirby-Bauer test.
16. The student will be able to test and analyze the effectiveness of disinfectants on bacteria.
17. The student will be able to test and analyze the effect of UV light on bacteria.
18. The student will be able to test and determine the number of bacteria in a sample of milk.
19. The student will be able to isolate indoor environment microbes and relate to sustainability.
20. The student will be able to determine a bacterial unknown with diagnostic test methods.
The student will be able to perform biochemical tests used to identify bacteria.
21. The student will be able to conduct nitrate tests, interpret results, and relate to sustainability.
22. The student will be able to conduct and interpret results for beta hemolysis on blood agar.
23. The student will be able to conduct and interpret results for lactose fermentation on MAC.
24. The student will be able to conduct and interpret results for lactose fermentation on EMB.
25. The student will be able to conduct and interpret results for mannitol fermentation on MSA.
26. The student will be able to conduct and interpret results for H2S production in TSI media.
27. The student will be able to conduct and interpret results for urease production in urea media.
28. The student will be able to conduct and interpret results for indole, methyl red, & citrate tests.
29. The student will be able to determine motility of bacteria in SIM media.

ASSESSMENT OF LEARNER OUTCOMES:
Student progress is evaluated by means of exams, written assignments, and class participation.

SPECIAL NOTES:
This syllabus is subject to change at the discretion of the instructor. Material included is intended to provide an outline of the course and rules that the instructor will adhere to in evaluating the student’s progress. However, this syllabus is not intended to be a legal contract. Questions regarding the syllabus are welcome any time.

Kansas City Kansas Community College is committed to an appreciation of diversity with respect for the differences among the diverse groups comprising our students, faculty, and staff that is free of bigotry and discrimination. Kansas City Kansas Community College is committed to providing a multicultural education and environment that reflects and respects diversity and that seeks to increase understanding.
Kansas City Kansas Community College offers equal educational opportunity to all students as well as serving as an equal opportunity employer for all personnel. Various laws, including Title IX of the Educational Amendments of 1972, require the college’s policy on non-discrimination be administered without regard to race, color, age, sex, religion, national origin, physical handicap, or veteran status and that such policy be made known.

Kansas City Kansas Community College complies with the Americans with Disabilities Act. If you need accommodations due to a documented disability, please contact the Director of the Academic Resource Center in Rm. 3354 or call: 288-7670.