Course Outcomes Guide (COG)

Directions: Please complete this form to document your progress toward improving student learning. For each item, indicate your progress and your anticipated next steps. Thank you!

Course Title: Microbiology 205 **Date:** August 2012

Course Team: David Karstaedt and adjuncts

Expected Learning Outcomes :

At the end of this course the student should be able to:

1. Recognize and explain the significant role that microbes play in the world around us.
2. Recognize and be able to explain the similarities and differences of microbes as compared to higher forms of life.
3. Identify microbes and explain methods of growth and cultivation as well as structural and biochemical differences.
4. Demonstrate an understanding of microbial structure, function, metabolism, growth, genetics, and control - including antibiotic usage.
5. Be able to explain the basic principles of immunology relating to host resistance, antigen-antibody reactions, vaccination, organism virulence and their ability to cause disease.
6. Demonstrate an understanding of the principles involved in epidemiology, infectious disease and a basic appreciation for how microbes cause disease, which diseases they cause, and characteristics that determine the course of the infection. Diseases and their etiologic agent will be noted and discussed by the student.
7. Evaluate the physical and chemical methods of microbial control.
8. Recognize microbial diseases and their control.
9. Be able to compare and contrast various methods for controlling microbial growth both in the environment and in the human body through the use of antibiotics, phage therapy and other alternative methods.
10. Be able to collect, analyze and evaluate empirical data to substantiate scientific concepts.

Assessment (How do or will students demonstrate achievement of each outcome? Please attach a copy of your assessment electronically.)

Students must successfully pass 4 lecture exams, 4 lab exams, any quizzes and in lab they must pass two bacterial unknowns in which they must correctly characterize and identify samples of

bacteria. In doing this they demonstrate their ability to streak a plate, make and gram stain a specimen on a slide, perform a motility test , identify colonial characteristics and correctly perform and interpret a variety of biochemical tests leading to the complete speciation of an unknown bacteria culture. Over the semester the students also keep a notebook of experiments and lab exercises which is graded and figures into their total grade for the semester. At the end of the semester all microbiology students, regardless of their instructor, will take a common assessment exam which is designed to cover the basic concepts covered in the semester as outlined in our outcomes. This common assessment is scored by means of a scantron electronically and data is stored for evaluation.

Validation (What methods have you used or will you use to validate your assessment?)

At the end of the semester the common assessment scantrons are scored and examined. For each section of 205 the scantron printout indicates median score, mean score, standard deviation and a complete item by item analysis of each question. With this information sections can be compared and individual questions that are routinely missed can indicate weak areas that need to be addressed or possible poorly worded questions that need to be changed on the test. Once a full analysis is done the results, including recommendations for improvement, can be sent to the instructors. Over time scores can be checked for overall or specific improvement.

Results (What do your assessment data show? If you have not yet assessed student achievement of your learning outcomes, when is assessment planned?)

Bio 205 – Microbiology

Semester	n	Mean score on common assessment exam*
Fall 2011	61	61.9%
Spring 2012	50	64.2%
Summer 2012	51	64.8%

* Includes all students from all classes (adjunct and full time instructors)

Follow-up (How have you used or how will you use the data to improve student learning?)

An item analysis of the most commonly missed questions indicates that #16 on epidemiology should probably be re-written as it is somewhat confusing and may elicit 2 correct responses.

Also Questions 2 and 3 which were also missed a lot have to do with growth characteristics. This should be emphasized more in lecture and demonstrated in the lab . As of this semester (Fall of 2012) the students will also now have access to Moodle which allows us to post information , quizzes, videos, etc. more readily than before. I will look for a good module on growth requirements and post it as an assignment on Moodle. The item analysis is also broken down by instructor and shows that certain instructor's students are weak in some areas. I will provide the adjuncts with their own item analysis and ask them to develop an action plan to address any deficiencies.

Budget Justification (What resources are necessary to improve student learning?)