

## 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:** May 2013

**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. A critical thinking question has been added to the final exam that presents data from an antibiotic test result and asks students to read the experimental protocol, evaluate the data and answer several questions about the scenario that tests their scientific reasoning skills.

**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.

The critical thinking question is evaluated by Instructor and results shared with the adjuncts.

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

### **General Education SLOA Summary**

General Education Category: Science

Semester: Spring 2013

Specific Gen Ed Course : Microbiology 205

Data Summary:

Critical Thinking Data for Microbiology 205

Spring 2013

Possible score is 5 points:

Instructor	Total students (n)	Raw data:	5	4	3	2	1	0
Karstaedt	31		15	9	4	1	2	0
O'Brien	15		5	3	3	4	0	0
Roberts	15		10	4	1	0	0	0
Total:		61	30	16	8	5	2	0
Percent:			49%	27%	13%	8%	3%	0

Average student score = 82%

**Discussion of Analysis Results:** (narrative in Word format of who, what, where, when, what was discussed and what was determined)

Analysis of the data shows that the average grade on the test was 82%. All of the instructors had the majority of their class in the 4/5 range which is passing.

Also we will be moving to a new lab book (recently evaluated this Spring ) and in that lab book there is a more extensive lab on antibiotics that I hope will help students understand the basic concepts and get used to working with this type of data. I hope we see improved scores this coming Fall.

**Course: BIO 205**

**SLOA Data**

**Faculty Team: D. Karstaedt, A. Manfre**

	SU 2009	FA 2009	SP 2010	SU 2010	FA 2010	SP 2011	SU 2011	FA 2011	SP 2012	SU 2012	FA 2012	SP 2013	SU 2013
# Active students	36	63	57	34	74	74	36	73	76	54	64	62	
% Withdrawn	2.8%	7.9%	5.3%	2.9%	4.1%	8.1%	5.6%	4.1%	5.3%	3.5	5.8%	3.1%	
*% walk-away Fs <small>No final exam/grade = F</small>							0%	0%	0%	0%	3%	4.6%	
% Success (A,B,C)	88.6%	87.3%	87.7%	97.1%	91.8%	81.1%	94.3%	91.7%	90.7%	100%	97%	98%	
Mean Common Lab Practical Score													
Common Comprehensive Final Exam Score								61.9 n=61	64.2 N=50	64.8 N=51	66 N=64	67 N=64	
Mean course grade	3.06	2.71	2.69	3.03	3.13	2.69	3.21	2.75 N=61	2.97 N=50	3.28 N=50	3.08 N=64	3.03 N=61	
Item Analysis <b>Weakest Content Areas</b>													

\*% Walk-away Fs = Did not take the final exam and received a grade of F.

**Content Areas**

Item analysis of the comprehensive test indicates questions 2 and 3,5,8,13 and 16 are being missed by >50% of the students. Questions 2 and 3 have to do with growth characteristics. I need to find a good module online to supplement the lecture on growth. Q16 is confusing and needs to

be rewritten. Q5 on the configuration of bacterial DNA indicates that many students are not getting the information from the current lecture which is based on a video from the ASM on genetics. I think it best to discontinue the video and present the information in a more organized lecture/discussion format.

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