

# Assessment: Assessment Plan

## Degree Program - AS - Microbiology (BS)

**CIP Code:** 26.0502.00

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**Program Purpose Statement:** Students majoring in microbiology for the B.S. degree must complete a minimum of 39 hours of core courses as well as additional biological sciences courses. Requirements include the following:

BIOL 1403, 1404, 4305, BIOL 3416 or MBIO 4406, BIOL 4101 and MBIO 3401.

At least five of the following courses, BIOL 3320, MBIO 4403, 4310, 4401, 4402, 4404, and 4406.

Additional 3000-4000 level courses in biology and microbiology to bring the total course hours from biological sciences to a minimum of 39.

CHEM 1307, 1308, 1107, 3305, 3306, 3105, 3106, and either 3310 or both 3311 and 3312.

Recommended electives: BIOL 3416, 4300, 4301, ZOO 3303, MBIO 4400, and FDSC 3301. May also use either PHIL 3322 or 3325.

Requires a chemistry minor, including either CHEM 3310 or both CHEM 3311 and 3312.

**Modality:** Face-to-Face

## Student Learning Outcome: Understanding Basic Microbiology

To have acquired critical thinking and scientific reasoning skills and understand the basic principles of microbiology, including the areas of general microbiology, physiology, genetics, virology, ecology, immunology, and pathogenic microbiology. .

**Outcome Status:** Active

**Outcome Type:** Student Learning

**Start Date:** 09/01/2016

**End Date:** 09/01/2017

### Assessment Methods

Method 1 –have at least 25 embedded questions at the beginning of Biology I (BIOL 1403 pre-test) and at the end of Biology II (BIOL1404 post-test) to assess how much the students have learned to critically think and understand the basics of Microbiology over the year in Biology I and II.

(Active)

**Criterion:** Method 1 - Method 1 - Students are able to answer at least 70% of embedded questions correctly on the second exam.

Method 2 - In MBIO 3401 students' lab performance will be evaluated. For example, students need to identify unknown bacteria and prepare a lab report, which requires the use of techniques and knowledge from the class and lab practice. Students' lab notebooks will also be evaluated which should reflect understanding of procedures and concepts, and document their activities and progress. (Active)

**Criterion:** Method 2 - Students are expected to show significant progress in the weekly write-ups in their lab notebooks, reflecting a growing appreciation of microbiological techniques and processes. Lab instructors will evaluate the notebooks on a

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regular basis to insure that this is happening.

## Student Learning Outcome: Microbiological essentiality and complexity

To appreciate the practical benefits of microorganisms to humans, including important agricultural, environmental, industrial, medical, and pharmaceutical applications, as well as the complexity of the microbial world as well as its essential role in sustaining life.

**Outcome Status:** Active

**Outcome Type:** Student Learning

**Start Date:** 09/01/2016

**End Date:** 09/01/2017

### Assessment Methods

Method 1 - In MBIO 3401 students' lab performance will be evaluated. For example, students need to identify unknown bacteria and prepare a lab report, which requires the use of techniques and knowledge from the class and lab practice. Students' lab notebooks will also be evaluated which should reflect understanding of procedures and concepts, and document their activities and progress.

(Active)

**Criterion:** Method 1 - Students are expected to show significant progress in the weekly write-ups in their lab notebooks, reflecting a growing appreciation of microbiological techniques and processes. Lab instructors will evaluate the notebooks on a regular basis to insure that this is happening.

Method 2- In Microbial Ecology (MBIO 4401) student learning will be evaluated based on in class discussion of primary literature, development and presentation of data collected in the lab, and development of presentation based on final exam topics, (Active)

**Criterion:** Method 2 - based on the lecture instructor and lab TA evaluations, students will be expected to take an active role in class discussions, maintain an up-to-date lab notebook so that the lab presentation are clear and concise and finally will chose and present on a topic that will be evaluated by both the lecture instructor and the other students on a scale of 1-5 (1 being poor, 5 being excellent) in terms of understanding the topic and ability to answer questions.

## Student Learning Outcome: Preparation for a postgraduate career

To be prepared for future educational opportunities in graduate or professional school programs and/or a career in the workplace,

**Outcome Status:** Active

**Outcome Type:** Student Learning

**Start Date:** 09/01/2016

**End Date:** 09/01/2017

### Assessment Methods

Method 1 - In The Genetics of Microorganisms (MBIO 4406) students will be evaluated in lecture by in-class graded quizzes, discussions of the implications and applications of course material. In the laboratory instructors will evaluate lab notebook, competence of experimental technique, quality of experimental results, attendance record, and level of participation.

(Active)

**Criterion:** Method 1 - Besides satisfactory performance on in-class exams, students must take an active role in class discussions

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in the lecture, In the lab, students will be expected to keep up-to-date laboratory notebooks, follow protocols and participate in lab group activities to the satisfaction of the lab TA.

Method 2 - In BIOL 4300 (Undergraduate Research) students are given individual or group projects in an active research lab; they are evaluated based on their work ethic and effort in the lab, presentations given at lab meetings or research conferences and their relative contributions to publishing the results of their work. (Active)

**Criterion:** Method 2 - In the research lab, students will be expected to independently work on either their own or a group project to the degree that a formal presentation will be given to the lab group that is clear and concise, and then provide criticism on their own presentations, as well as other students in the lab. Some mentors expect presentations at regional or national meetings where the student is first author and presenter. If the results of the research are to be published, authorship (and relative position on the author line) will be determined by contributions to the generation of data and to the writing of the manuscript.