DEPARTMENT OF MICROBIOLOGY
Curricular Outcomes

Upon graduation, microbiology majors should be able to:

1. **demonstrate a sound working knowledge of the field of microbiology**.

    - to show that they have acquired a foundational knowledge of microbiology that allows them to continue to grow in the field.

    - to show that they can apply their foundational knowledge in microbiology when challenged with new situations by asking intelligent questions that lead to an understanding of the new situations.

    - to show that they can synthesize from the answers to those questions new knowledge about microbiology.

    Opportunities to guide learning: multiple-choice/true-false test questions, short-answer and essay test questions, oral and written presentations of project reports

2. **demonstrate a command of the skills necessary to perform effectively and safely in a microbiology laboratory.**

    - to show that they have mastered the techniques essential to sound laboratory practice.

    - to show that they can ask pertinent questions about microbiology, formulate hypotheses based on those questions, and design experiments to test those hypotheses.

    - to show that they can apply deliberate and thorough observational skills to conduct experiments and collect data.

    - to show that they can organize and summarize data and present them in a way that is accurate and comprehensible in both verbal and graphical modes.

    - to show that they can interpret data and draw conclusions that allow the students to support or refute hypotheses and make a case for alternative hypotheses.

Opportunities to guide learning: lab notebooks, lab practicals, lab reports, oral and written project proposals, scientific papers, oral presentations of experimental data, poster presesntations

3. **understand, manage, and apply information about microbiology from both scholarly and popular sources and to communicate their understanding clearly and coherently for different audiences**.

- to show that they can effectively explain information related to microbiology in the popular press to non-scientific audiences.

- to show that they can summarize the important information from scientific articles.

- to show that they can make a critical judgment of scientific material, using as support their analysis of its research questions and hypotheses, the appropriateness and precision of its research methods, the effectiveness of its presentation of results, and the interpretation and conclusions it draws from the results insofar as they answer the research questions.

- to show that they can effectively organize and make sense of scientific information from multiple sources, raise pertinent questions about that information, and draw appropriate and useful conclusions from it.

- to show that they can find suitable scientific sources for answering questions about microbiology, evaluate the pertinence, value, and credibility of those sources, and make a convincing case for their answers using evidence from the sources.

Opportunities to guide learning: summaries of articles from the popular and the scholarly press, oral presentations to non-scientific audiences, class assignments that ask students to "explain it to their grandmother," critical analyses of scientific articles, literature reviews