First-Semester Undergraduate Research in Biochemistry & Molecular Biology (BMB) for 2 credits

Guidelines and Expectations for both Students and Research Mentors

within or outside of the BMB Program

(BB 340)

The general guidelines for all courses for credit in undergraduate research and/or honors are applicable to this course and should be incorporated with the following guidelines that pertain the earning general education credit for taking this course.

Responsibilities of the Student:

HUB requirements: Earning general education units involves requirements for earning HUB units in RIL during your first semester research course.

Responsibilities of All Research Mentors:

In the first semester of research, all students should begin the learning of how to use the literature in their efforts to learn the background information for the project you are giving them. The timeframe for this achievement is mostly as a prerequisite before and during the application process. Work closely with your student and teach them how to access research information so they can prepare and submit a research proposal before being registered for their research course.

General Education (BU Hub)

1. Research and Information Literacy (RIL):

Learning Outcome 1: Students will be able to search for, select, and use a range of publicly available and discipline-specific information sources ethically and strategically to address research questions.

Accessing Information: This skill is needed for selecting a group and a project, and student should become familiar with methods for exploring and understanding the research literature, if not already achieved from earlier courses. Among the many tools available in the biological sciences, PubMed stands out as the most critical for *accessing information*. Other platforms, such as SciFinder, can also play a vital role in achieving Information Literacy depending on the research group. Nonetheless, *comfortable* familiarity with PubMed is an expected starting point for students engaged in the first semester of research.

Assessing Information: Progress in research and assessing research information is achieved in individual meetings with the group PI, and through group meetings, which all groups hold. At these meetings, literature is routinely discussed and judged as to the suitability for application to the research project at hand, and to the validity of the

research. As with all courses, successful training in assessing information begins with the mentor. One advantage of Research and Information Literacy training in the research lab is the "flipped classroom" environment. In the sciences, the laboratory is the ultimate flipped classroom, and the novice researcher has the expertise and experiences of other undergraduate, graduate, and post-doctoral fellows also in the group as catalysts for the training. These other researchers serve as invaluable mentors, and the group meetings become a critical vehicle for information assessment.

Using Information Ethically: Ethics training is an important part of all research groups and should be incorporated in discussions at group and individual meetings.

Learning Outcome 2: Students will demonstrate understanding of the overall research process and its component parts, and be able to formulate good research questions or hypotheses, gather and analyze information, and critique, interpret, and communicate findings.

Producing Information through Inquiry: As per current practice, in order to register for research, a description of the project, and the student's role in the project must be submitted. This process includes approval of the PI and/or BMB faculty-member sponsor in multiple rounds of drafts and final approval before submission. The Chair of the BMB Research and Honors Committee reads and approves all applications, and proper use of the literature is expected. Appropriate literature citations are required for the abstract of the project description and if found deficient, the Chair contacts the student for corrections in the research literacy and scholarship.