

Fourth-Semester Undergraduate Research in Biochemistry & Molecular Biology (BMB)

Guidelines and Expectations for both Students and Research Mentors within or outside of the BMB Program (BB 453)

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 the ongoing efforts made during your first three semesters of research experience. This includes continuing required attendance and participation in laboratory meetings on a regular basis, the continued experience and use of the online research information and literature, exercise in critical thinking in design and execution of experiments, and in scientific writing. This semester students have the opportunity to register for BB 497 (fall) or BB 498 (spring) as a co-requisite where an additional HUB unit is earned in Digital Media and Expression (DME).

Responsibilities of All Research Mentors:

By the fourth semester of research, besides the ongoing opportunities afforded undergraduate research students with less experience (training in online information sources, attendance and participation in lab meetings, encouraging critical thinking, and regular writing assessment), students in their fourth semester of research should be encouraged to practice presenting their work using digital media, which will be taught by enrolling in a co-requisite of BB 497 (fall) or BB 498 (spring).

General Education (BU Hub)

1. Digital/Multimedia Expression (DME):

Students in the fourth semester of UGR will have a chance to enroll in the 1-credit Honors Research Seminar as a co-requisite (either BB 497 or BB 498). This course meets every week or two with the Honors class and offers these advanced students important underpinnings to their research; including organization and presentation techniques for scientific communication using various digital media. Specifically, the course helps students prepare and present scientific problems and data using digital media and strengthen students' effectiveness in communication through written and oral venues. The specific Learning Outcomes for DME are outlined below:

Learning Outcome 1: Students will be able to craft and deliver responsible, considered, and well-structured arguments using media and modes of expression appropriate to the situation.

An oral presentation at the beginning of the semester in the form of a 10-minute symposium talk, a one-slide challenge in the middle of the semester, and another longer presentation at the end of the semester in the form of a defense of their research. The oral presentations are typically digital as a PowerPoint presentation, often with embedded videos, although other multimedia modes available in the Adobe Suite will be introduced.

Learning Outcome 2: Students will be able to demonstrate an understanding of the capabilities of various communication technologies and be able to use these technologies ethically and effectively.

While the primary medium for the presentations are slides for the oral presentation, designing slides that coherently guide the audience through the talk without an overabundance of information is a targeted outcome. The slides themselves take advantage of various graphics packages (ChemDraw, Prism-GraphPad, Gaussian and Firefly, Quick Time videos, to name a few) incorporated into a concise PowerPoint presentation. These presentations are readily constructed from numerous presentations the student has given in the past in group and sub-group meetings (OSC HUB unit), and even presentations given at UROP poster sessions, as well as in regional and national meetings. Furthermore, at multiple points in BB 497 and/or BB 498 explicit introduction into scientific publication, both oral and written, is provided with guidelines in ethics of each mode.

Learning Outcome 3: Students will be able to demonstrate an understanding of the fundamentals of visual communication, such as principles governing design, time-based and interactive media, and the audio-visual representation of qualitative and quantitative data.

This outcome perfectly describes a scientific research presentation. Students must be concise and capable of a logical flow of thoughts as they present their results and draw their conclusions, often culminating in projections of future research directions. The proper presentation and visual design of both qualitative and quantitative data is demonstrated in the final oral presentations at the end of the semester. Training for the event really begins with the group meetings, but will be rounded out in the BB 497 and/or BB 498 sessions.