
UND SMHS Strategic Plan Individual Unit Report for 2021

GOAL 1 for BIOMEDICAL SCIENCES

LEARNING

One UND Strategic Plan Goal 1: Provide a strong undergraduate liberal arts foundation
UND SMHS Strategic Plan Goal 1: SMHS Units that offer educational programs will expand their curricula to include learning outcomes that align with UND's Essential Studies goals.

- *Critical Inquiry and Analysis*
- *Quantitative Reasoning*
- *Written Communication*
- *Oral Communication*
- *Information Literacy*
- *Intercultural Knowledge and Skills*

1. Describe if/how your unit has addressed this goal.

BIMD518. This is an advanced graduate grant proposal writing and oral presentation course. The objectives of this course are to challenge students: (1) to critically evaluate their own research in an effort to clearly define the significance and innovation of their research projects, (2) to begin to develop novel ideas based on their research efforts that have the potential to significantly impact their field of study, and (3) to prepare students to present these ideas orally and in writing in a manner that is both logical and convincing.

BIMD 220/221 + Labs. These new Human Anatomy and Physiology courses (replacing ANAT 204 & PPT 301) are certified as Diversity of Human Experience (D) breadth of knowledge and Math, Science, & Technology (MST) special emphasis essential studies courses. They address the goals of intercultural knowledge and skills and quantitative reasoning. These courses are the ONLY courses across UND campus that cover both MST & D.

BIMID 494 Intersession. In response to a call for novel intersession courses for the winter holiday break over 2020-2021 our department developed a special topics course on the life of Henrietta Lacks and her role in biomedicine. This course was certified through a special process as a Diversity of Human Experience course.

BIMD 301 and BIMD 401. These serve as required or elective courses for multiple undergraduate majors housed in the SMHS, Arts and Sciences, Engineering, and Nursing. The courses are rigorous and provide excellent pre-health professional preparation in biochemistry and molecular biology. The courses emphasize critical inquiry and analysis, quantitative reasoning, and written and oral communication. Less so in the areas of information literacy and intercultural knowledge. These courses, however, are not classified as Essential Studies courses.

BIMD 302/L and BIMD 328. These serve as required or elective courses for multiple undergraduate majors housed in the SMHS, Arts and Sciences, and Engineering. The courses provide excellent pre-health professional preparation in microbiology and immunology. The courses emphasize critical inquiry and analysis, quantitative reasoning, and written and oral communication. These courses, however, are not classified as Essential Studies courses.

BIMD 510. This course consists of a series of lectures and exercises to provide students with the basic rationales and use of statistics in the assessment of biomedical data including the use of descriptive and inferential statistics, estimation techniques, and measures of effect size.

BIMD 516. This course is designed to provide graduate students preparing for a career in the biomedical sciences the knowledge on various aspects of ethics pertinent to the conduct of scientific research. While most students will initially see ethics as white and black, this class will provide them the ability to begin to see that the shades of gray are often what clouds our decision making and interpretation of ethics. Real examples of misconduct and issues pertaining to ethics in science will be discussed in class to help guide the students along the path of developing a solid foundation on which they will base their ethics.

BIMD 590. The goal of the "Annual Graduate Student Assessment (AGSA)" is to provide the student with their advisor's and their Faculty Advisor committee feedback on their yearly progress. The AGSA also provides the student with an opportunity to provide a self-evaluation of their progress and an evaluation of their overall goals.

BIMD501/502. This course was redesigned to provide fundamental concepts and methods in biochemistry and molecular biology to typical biomedical and biology graduate students. After successfully completing this course, students should be able to: (1) Identify, read, interpret, and analyze the current general and scientific literature as it applies to unsolved, topical questions at the forefront of the biomedical sciences; (2) Apply foundational, cross-disciplinary knowledge in biochemistry, molecular biology, cell biology, and other biomedical disciplines to identify and explore current hypotheses and address gaps in our knowledge with regard to complex biological questions; (3) Learn the fundamentals of solid experimental design and critical data analysis with an emphasis on exploring state of the art methodology and designing both carefully controlled experiments and logical workflows for use in the research laboratory; (4) Develop oral and written communication skills to communicate complex scientific material including the significance and broader impacts of ongoing scientific research to members of the scientific community and to the public.

The department is developing a plan for a biomedical sciences 4+1 major that is aligned with the SMHS strategic plan including Goal 1.

2. Describe how your efforts are measured/assessed.

BIMD518. Students demonstrate proficiency as evaluated by 4 scored writing assignments (4 x 125 pts) and 2 in-class student practice defense presentations (2 x 100 pts). Thirty percent of the grade (1 x 300 pts) is determined based on a priority score assigned by at least three Biomedical Sciences faculty members invited to evaluate the final written proposal and to participate in the students' oral defense of the proposal. Grades are earned based on the following scale (1000-933 pts (A), 932-867 (B), 866 and below (C)).

BIMD 220/221 + Labs. These courses were approved by the essential studies committee. They are continually assessed by SELFI surveys. The instructor of record is pursuing grant funding to do additional assessment of their unique components.

BIMID 494 Intersession. This course was approved by the special intersession committee and was assessed by the SELFI survey.

BIMD 301 and BIMD 401. These are also assessed by SELFI survey. Periodically, student outcomes are measured against quantifiable student behaviors or external metrics. For example, a 2019 study of BIMD 301 peer- and self-evaluations revealed an effect size of 5.8% for students who were perceived by their peers to be prepared for class. In another example, MCAT scores were positively correlated with and BIMD 301 outcomes ($r=0.67$) based on a cohort of 31 SMHS medical school applicants.

BIMD 302/L and BIMD 328. The lecture courses have been assessed using the standard SELFI. The 302 Lab section was assessed in the Spring 2021 using a survey designed uniquely for the changes that were incorporated to better align with Essential Studies goals.

BIMD 510. The course is evaluated by exams and student assessments. It is the Scholarly Tool" for the program.

BIMD 516. The course is evaluated by writing assignments, exams, and student assessments.

BIMD 590. Assessment from the graduate committee and mentor to the student is submitted via an online form submission to the SGS.

BIMD 501/502. Assessment is via student feedback, exams, writing assignments, and homework assignments.

All undergraduate courses and graduate courses have the opportunity to be evaluated annually by the departmental undergraduate and graduate education committees, respectively.

3. How were the data analyzed and what were the outcomes?

BIMD 220/221 + Labs. These courses just launched in fall 2020 so there has been limited time to analyze the data, but the instructor did receive a course development award for the SPEA versions and was nominated for the undergraduate teaching excellence award for Founder's Day.

BIMID 494 Intersession. This course was offered once so far, wrapping up in January 2021. There has been limited time to analyze the SELFI data.

BIMD 301 and BIMD 401. These are ongoing with limited time to analyze the SELFI data.

BIMD 302/L and BIMD 328. SELFI scores were high across the board. The highest areas were engagement, learning environment, and individual rapport. The individual survey for 302L indicated that students appreciated the format of the new course.

BIMD 510. The course was difficult to translate into an online format.

BIMD 516. The course went according to plans.

BIMD 590. The new SGS online submission form was affective for university record keeping but it does not forward to the graduate director.

BIMD 518. The online format was effective although some technical challenges existed.

BIMD 501/502. The new course format was challenging for students.

The annual course evaluations include review of course syllabus and course objectives, grade outcomes, DFW rates, SELFI evaluations, reflective statements and goals for next year by the instructor, and peer feedback.

4. Describe how your unit will implement any further changes and what barriers may exist.

Course evaluations inform future changes with the aim of striving for best practices. One significant barrier is the inability to schedule SMHS classrooms on a schedule that is observed by the main campus.

BIMD 302/L and BIMD 328. No new changes are planned for the upcoming year beyond small edits to keep content current. Time, faculty effort availability, and lack of lab equipment and adequate instructional space are the barriers we face when we look at making changes to our teaching practices.

BIMD 510. The online delivery has been updated with software/hardware to improve the experience.

BIMD 516. No changes are planned.

BIMD 590. Committees will need to do an extra step and send a copy of the annual assessment to the dept. graduate director.

BIMD 518. The course will be taught using a hybrid strategy next year with content lectures and instructor feedback being given in person, while peer-feedback and open discussions being given via zoom at the students discretion.

BIMD 501/502. Increased time will be spent to clarify expectations at the beginning and throughout each section of the course.

PROVIDE A RATING OF YOUR PROGRESS ON THIS GOAL:  **XOn Track;**  **Delayed;**  **Behind**
(additional space for text is provided on page 2 if needed)

Additional Information on Goal 1 (optional):

BIMD518 Course Goals:

1. To provide students with a structured, interactive learning environment in which they can begin to develop and refine ideas into testable hypothesis.
2. To increase student immersion in their own research projects with an emphasis on communicating ideas, reading the scientific literature, formulating hypotheses, and designing experiments.
3. To prepare Students in the Biomedical Sciences Graduate Program for the written component of their comprehensive exams.
4. To help students prepare a complete draft of a proposal that may be suitable for submission to both public and/or private extramural granting agencies.

BIMD518 Course Objectives:

1. Students will demonstrate depth and integration of knowledge in specific subject areas of their choice to support their research and to allow them to make meaningful contributions that advance the discipline.
2. Students will demonstrate the ability to develop clearly stated meaningful hypotheses and research questions that lead to scientific investigation in areas relevant to the biomedical sciences.
3. Students will demonstrate the ability to select, design, and implement experimental approaches to rigorously test their hypotheses.
4. Students will demonstrate the ability to present their research clearly, concisely, and accurately in both oral and written form to experts in the field and to a general scientific community.
5. Students will demonstrate the ability to effectively communicate their scholarly work to a lay audience in a way that illustrates the accomplishments and importance of scientific research.