Annual Academic Assessment Report

Bachelor of Science in Biomedical Engineering (BMEGBS)

Student Learning Outcomes:

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. an ability to communicate effectively.
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgements, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgement to draw conclusions.
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Assessment and Evaluation: AY 2022-2023

The faculty of the Department of Biomedical Engineering evaluated Student Learning Outcome assessment data at two faculty meetings, held in January 2023 (for Fall 2022 courses) and May 2023 (to discuss Spring 2023 courses). The results of the analysis include the following:

- **Outcome 1**:
    - Problem solving skills exhibited on exam/homework problems in the Biomechanics (BMEG 2813), Biomedical Modeling and Numerical Methods (BMEG 3653) and Biomedical Transport (BMEG 4623) courses indicate students are achieving the Outcome at the desired level.
    - Problem solving skills exhibited on exam/homework problems in the Biomedical Systems and Signals (BMEG 3124) course indicate students are NOT achieving the Outcome at the desired level.

- **Outcome 2**:
    - Engineering design skills exhibited in the Clinical Observations and Needs Finding courses (BMEG 3801) and Capstone Design experience (BMEG 4813) indicate students are achieving the Outcome at the desired target level.
- **Outcome 3:**
    - Communication skills exhibited in the Biomolecular Engineering (BMEG 3824) and Capstone Design experience (BMEG 4823) indicate students are achieving the Outcome at the desired target level.
- **Outcome 4:**
    - Recognizing ethical and professional responsibilities to make informed judgments exhibited in the Introduction to Biomedical Engineering (BMEG 2614), Biomolecular Engineering (BMEG 3824), Clinical Observations and Needs Finding courses (BMEG 3801), and Capstone Design experience (BMEG 4813) indicate the students are achieving the Outcome at the desired target level.
- **Outcome 5:**
    - Teamwork and leadership exhibited in the Biomaterials (BMEG 3634), Capstone Design (BMEG 4823) courses indicate students are achieving the Outcome at the desired target level.
- **Outcome 6:**
    - Conducting experiments, analyzing data, and drawing conclusions exhibited in the Biomedical Instrumentation (BMEG 2904) and Biomaterials (BMEG 3634) laboratory courses indicate the students are achieving the Outcome at the desired target level.
- **Outcome 7:**
    - Obtaining and applying new knowledge exhibited in the Introduction to Biomedical Engineering (BMEG 2614) and Capstone Design (BMEG 4813) courses indicates students are achieving the Outcome at the desired target level.

Changes to the Degree Program – Planned or Considered

- The Department is considering changes to course prerequisites as part of the BMEGBS program as part of continuous improvement during AY 2023-24
- The Department is in the planning phase for major changes to the curriculum, notably the creation of specific tracks within the BMEGBS program.

Changes to the Assessment Process – Planned or Completed

- Data related to Outcome 1 (problem solving) in the Biomedical Systems and Signals (BMEG 3124) course will continue to be collected and monitored to further analyze students' difficulty in problem solving within this specific course.