**Dr. *Brown***

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| BME 4011 | Spring 2024 |

**BSBME Program Learning Outcomes**

1. An ability to identify, formulate, and solve complex engineering problems (including those associated with the interaction between living and nonliving systems) by applying principles of engineering, physical (calculus-based physics, chemistry) and life sciences (biology, human physiology), and mathematics (through differential equations and statistics).
2. An ability to apply engineering design to realize/produce solutions that meet specified biomedical engineering problems and 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 with a range of audiences.
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, health, safety, 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 to measure, analyze and interpret data from living and non-living systems, and use engineering judgment to draw conclusions.
7. An ability to acquire new knowledge as needed, using appropriate learning strategies in acquiring techniques and skills necessary for biomedical engineering practice; including the ability to model and perform engineering analyses of biomedical devices, systems, components and processes.

BME 4011 HML table

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Please provide **2 unique example questions** for each of these high-priority outcomes with associated average score and number of students tested.

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| **BME Outcome B**  An ability to apply engineering design to realize/produce solutions that meet specified biomedical engineering problems and needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors. |

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| First sample question to meet this outcome:  Paper on medical devices after attending ISET.  Attend ISET and talk to company medical representatives about their devices they have on display.  Pick two that interest you and discuss the disease or abnormality they were approved to treat and how they function.  Discuss the possible risks of each device as well as the benefits or advantages of using that device versus other devices on the market.  1-2 pages for each device is sufficient.  If you are unable to attend ISET for any reason, pick two devices used by interventional radiologists for either cardiac, neuro or peripheral conditions that interest you and answer the same questions as above. | Second sample question to meet this outcome: Midterm Question 1   1. A patient comes to see a physician (YOU) for recent onset mid epigastric pain that is burning and very severe. The pain was first noticed when the patient was at the gym exercising on the treadmill.  The patient became queasy and started vomiting. The patient shows up in your office and seeks relief.  Describe the PROCESS that you would go through in evaluating the patient as well as what would you would do to determine what was wrong with this patient.  Go through the process telling me what you would do from start to finish.   Tell me all the results as you proceed as well as well as your thought processes on how you would proceed after each step.  Be as DETAILED as possible describing your theoretical patient.  Give me the patient’s history, a list of all possible things that could be wrong with this patient (the differential diagnosis) and how you would distinguish which of the possible diseases the patient had?  Give specific test results as you proceed and how you would proceed based on the result. |
| Average Score: 23.4/25.0 93.6% | Average Score: 17.2/20.0 86% |
| Number of students tested: 25 | Number of students tested: 25 |