

**BENG 100 Frontiers of Biomedical Engineering**  
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**Chapter 1**

**SUMMARY**

- Life expectancy and quality of life has increased for people in most nations of the world during the last century; the development of reliable, safe, and inexpensive medical technology by biomedical engineers has played an important role in this enhancement.
- Emergency rooms, hospitals, doctor's offices, and homes contain medical instruments and products that resulted from 20<sup>th</sup> century biomedical engineering.
- Biomedical engineering is the use of application of science, mathematics, and engineering design principles to improve human health.
- Human physiology is the foundational science that distinguishes biomedical engineering from other forms of engineering; throughout history, advances in our understanding of physiology has led to new biomedical engineering technology.
- Biomedical engineering is growing in interest among students, and opportunities for biomedical engineers to find productive work and contribute to society are increasing rapidly.
- Biomedical engineers often specialize in a variety of sub-disciplines or fields such as physiological modeling, biomedical instrumentation, biomedical imaging, biomechanics, biomolecular engineering, artificial organs, and systems biology.
- Emerging human diseases and new discoveries in physiology and human health promise to present new problems for biomedical engineers of the future.

**QUESTIONS**

1. Write a definition (1-2 sentences) of biomedical engineering in your own words (test yourself by not looking back at any of the definitions in the text when you write your own definition).
2. Make two lists (of at least 10 items each) in response to the following two questions:
  - A. What products of biomedical engineering have you personally encountered? Pick 3 of these products and write a description of what you think is good, and what could be improved in that product.
  - B. What products of biomedical engineering do you expect to encounter in the next fifty years?
3. Pick a faculty member who teaches or does research in biomedical engineering from your department for this exercise.

- A. Perform a Medline search with your selected faculty member as the author to find a list of articles that they have written in the past two years.
  - B. Select one of the articles and find a copy of it in your library (or online if it is available in that format). Read it and write a brief review of the findings for a general audience. In which subdiscipline of biomedical engineering does this research work belong?
4. Interview an older family member (parent, grandparent, aunt, uncle) about an advance in medicine that they remember. Why was this advance memorable to them? How did they find out about it?