

BME101 Introduction to Biomedical Engineering



BIOMEDICAL ENGINEERING WORLD

Prof. Dr. Serpil TAKAÇ

**Ankara University
Department of Biomedical Engineering**

What is biomedical engineering?

Biomedical engineering is a multidisciplinary field of engineering, which develops devices and solutions for diagnosis, therapeutic and regenerative purposes targeted to health sector by applying engineering principles to biology and medicine.

Disciplines of biomedical engineering

Bioinstrumentation

Biosignals

Biomaterials

Tissue Engineering

Biomechanics

Biosystems

Biotransport

Cellular Engineering

Clinical Engineering

Rehabilitation Engineering

Bioinstrumentation

Bioinstrumentation is the application of electronics and measurement principles and techniques to develop devices used in diagnosis and treatment of disease.

Biosignals

Biosignals are used to uncover the mechanisms of signal production, and the fundamental origins of the variability in the signal.

Biomaterials

Design and development of materials for medical devices, implants and diagnostic products.

Tissue Engineering

Growth of new tissues or organs from cells and scaffolds to produce a fully functional organ for implantation back into the donor host.

Biomechanics

Covers both biofluid and biosolid mechanics at the molecular, cellular, tissue, and organ-system levels.

Biotransport

- Covers transport processes from the organ to the subcellular level.
- Transport of mass, momentum, and energy

Cellular Engineering

Molecules and cells are the building blocks of organ systems

Clinical Engineering

Application of technology for health care in hospitals.

Rehabilitation Engineering

Improves the quality of life for individuals with physical impairment.

References

- Enderle J, Bronzino j. Introduction to Biomedical Engineering, 3rd Ed., Elsevier, Oxford, 2012
- Imperial College London, Department of Biomedical engineering, internet access: 2015
- Mohamed Bingabr, Department of Engineering and Physics University of Central Oklahoma, Biomedical Engineering A New, Promising Interdisciplinary Field, internet access: 2015