

**BME101 Introduction to Biomedical Engineering**



# **BIOMATERIALS**

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- **What is a Biomaterial?**

A biomaterial is any substance that has been engineered to interact with biological systems for a medical purpose

- Biomaterials are used for a variety of purposes within the body.
- Annual biomaterials use exceed billions of USD worldwide annually.

- **History of Biomaterials**
  - Some materials used in dentistry and prosthesis more than 3000 years ago
  - Aseptic surgery, bone plate, artificial joints, synthetic plastics
- **1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> generation biomaterials**
  - From structural supports to tissue engineered products

- **Biocompatibility**
  - The ability of a material to perform with an appropriate host response in a specific application
- Host response
- Foreign body reaction

- **Types of Biomaterials**
  - Metals, Ceramics, Polymers, Composites
- Metals: Co-Cr alloys
- Ceramics: Aluminium oxides
- Polymers: PMMA

# Biomaterials Related Courses in Our Curriculum

- BME 341 Biomaterials
- BME332 Biomaterials and Biomechanics Lab
- BME441 Cell and Tissue Engineering
- BME447 Introduction to Polymer Engineering
- BME444 Controlled Release Systems and Drug Targeting