



# Extracellular Matrix in BME

## BIOMEDE 5359

**Credit Hours:**

3.00 - 3.00

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**Course Levels:**

Undergraduate (1000-5000 level)

Graduate (5000-8000 level)

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**Course Components:**

Lecture

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**Course Description:**

Extracellular matrix (ECM) present in mammalian tissue(s) is important for the integrity and tensile strength of the underlying tissue as well as for cell-matrix interactions and matrix mineralization. This course provides an overview of the composition, structure and function of ECM and its application(s) for the BME domains of biomaterials, tissue engineering and biomechanics.

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**Prerequisites and Co-requisites:**

Prereq: 4310 and Chem 2310; or Grad standing; or permission of instructor.

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**Course Goals / Objectives:**

- Categorize the different levels of many biopolymer structures within cells, tissues, bone and blood
  - Tensile strength and properties of ECM proteins.
  - Quantify the importance of ECM in normal body function, including calculations of enhanced strength and hierarchical structure of bone, and influence of protein structure on macroscopic mechanical properties
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**Course Topics:**

- Introduction to polymer chemistry and relevance to biopolymer synthesis. Symmetry theory. Building blocks (monomeric units) of biopolymers: amino acids and nucleotides.
  - Biopolymers and energy
  - Biopolymers and coagulation
  - Biopolymers and the extracellular matrix
  - Biopolymers-polysaccharides
  - Biopolymers and cartilage/bone
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**Designation:**

Elective