2026, Term II
ChE 782 Biopharmaceuticals

Instructor:
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Lectures: One 2 hr lecture/week
Big picture:
The term biopharmaceuticals usually refers to peptide, protein and nucleic acid based therapeutic products such as insulin, monoclonal antibodies, vaccines and interferon. The product and process development, manufacturing, formulation and analytical technologies involved with such products are significantly different from those for low molecular weight pharmaceuticals. This course aims to introduce students to some of the technological aspects related to biopharmaceuticals.

Course outline:
Introduction to biopharmaceuticals; product development and characterization; production technologies; analytical techniques; survey of biopharmaceutical products: vaccines, cytokines, hormones and growth factors, blood products, monoclonal antibodies, nucleic acid therapeutics, and chemically modified therapeutics such as PEGylated proteins.

Statement of purpose:
A graduate course on biopharmaceuticals will be useful to chemical engineers looking for career opportunities in the pharmaceutical industry.

Suggested reading:
- **Biopharmaceuticals: Biochemistry and Biotechnology,** Gary Walsh, Wiley-Blackwell; 2 edition (2003)
- **Biotechnology and Biopharmaceuticals: Transforming Proteins and Genes into Drugs,** Rodney JY Ho and Milo Gibaldi, Wiley-Liss; 1 edition (2003)

Assessment method:
- Term paper (35%)
- Term-paper seminar (15%)
- Assignments (5 × 10% = 50%)