

# BIOENGINEERING (BENG)

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# Course numbers with the # symbol included (e.g. #400) have not been taught in the last 3 years.

## **BENG #825 - Cell Phenotyping and Tissue Engineering Laboratory**

**Credits:** 4

Introduction to culture and phenotyping of mammalian cells (cell line models), with applications to bioengineering and biomedical sciences. Skills, techniques, and knowledge covered include sterile technique, cell culture, cell line models, cell proliferation, cell survival, cell migration, cell adhesion, and drug response. Inquire-based team projects investigate cell proliferation, cell death, transfection, flow cytometry, 3D scaffolds, or cell imaging.

**Grade Mode:** Letter Grading

## **BENG 855 - Computational Molecular Bioengineering**

**Credits:** 4

Introduction to fundamental concepts in biophysics with primary emphasis on understanding details of biomolecular structures integrated with molecular modeling, simulation, and visualization techniques. The course introduces structural details of various biomolecules (proteins, nucleic-acids, sugars, and lipids), followed by concepts in thermodynamics and physical chemistry (such as intermolecular forces, energy, entropy, chemical potential, and Boltzmann's distribution), the applications of which are discussed in the context of drug-receptor interactions, molecular recognition, biomolecular folding, enzyme catalysis, allosteric communication, diffusion, and transport. The laboratory includes training and learning about advanced simulation and visualization software engines.

**Grade Mode:** Letter Grading