BIOMEDICAL ENGINEERING (BME)

BME 504: Numerical Methods in Bioengineering

3 Credits

Students study numerical methods applied to Bioengineering applications through computations. The course is designed to teach numerical methods and computational techniques for modeling physiological systems and medical devices. Topics include differentiation equations, finite difference methods and finite element methods. Finite element modeling software will be covered. Examples include physiological systems at the organ and cellular levels, physio-chemical analysis of biological systems, and transport phenomena in engineered devices. Computing programming experience is required to be successful in this course.

BME 590: Colloquium

1-3 Credits/Maximum of 3

Continuing seminars which consist of a series of individual lectures by faculty, students, or outside speakers.

**Prerequisite:** BME 590

BME 591: Bioengineering Ethics and Professional Development

1 Credits/Maximum of 999

Problem solving methods in ethical decision making, best practices in research communication, and strategies for professional development. This course will cover the main philosophical underpinnings of bioengineering ethics. It will then assist in developing methods for ethical decision making in the main areas of bioengineering professional practice. These areas include data collection, management and presentation, animal and human experimentation, peer review and authorship, and social implications of bioengineering research. The course will then assist in the professional development of students by instruction in tools for effective acquisition of discipline-specific conceptual knowledge, research skill development, communication, management, leadership.

BME 594: Research Topics

1-2 Credits/Maximum of 6

Supervised student activities on research projects identified on an individual or small-group basis.