BME 735: Bio-Computational Modeling

Instructor: Dr. Kim Cluff, kim.cluff@wichita.edu
Classroom; Days/Time: Tuesday & Thursday 12:30-1:45pm
Prerequisites: BME 462 or ME 521, BME 335 or equivalent, or instructor consent

Bio-Computational Modeling (BME735) prepares students for real world engineering practice by introducing them to 3D multi-physics computer modeling software. In this course students will learn how to use COMSOL Multi-physics simulation software linked with Solidworks and MatLab to solve engineering problems in complex 3D geometries such as the human body. Within the simulation software environment students will define their geometry, set boundary conditions, specify the physics, set material properties, mesh, simulate, and then visualize their results.
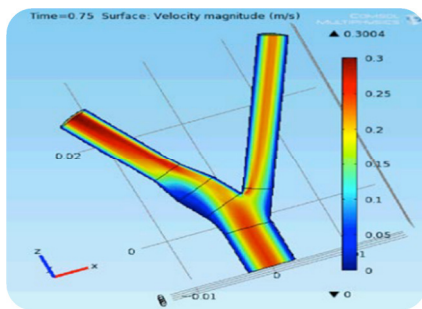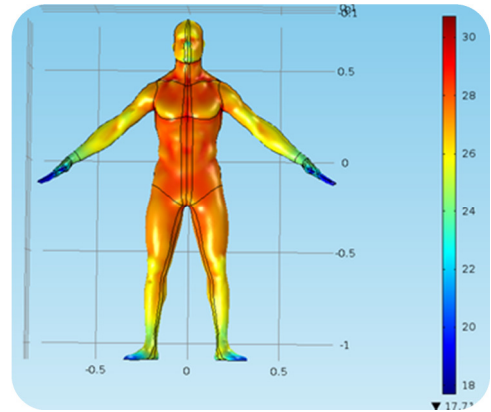
Topics will include:

- Modeling of Biofluid mechanics
  - Blood flow in human arteries
- Heat and mass transfer modeling
  - Bioheat and drug delivery
- Structural mechanics
  - Stress and strain on bone
- Solidworks – CAD drawing

Computer simulation has become an essential part of science, medicine, and engineering, this course will give students hands on experience to meet those demands.