



6. Be familiar with the principles and general methodology of finite-element analysis and its application to biological systems.

6. *Topics covered (number of lectures per topic, based on fifteen 50-minute lectures per semester):*

Introduction to mathematical tools used in engineering including MatLab (1)

A survey of multiple mathematical applications in a bioengineering problem – cochlear implant design and application (2)

Qualitative analysis of differential equations (1)

Bacterial growth models (1)

Models limiting growth (1)

Interspecies population models (2)

Epidemic Models (1)

Compartmental Models (1)

Techniques in numerical analysis (1)

Fourier analysis – speech and image processing (2)

Wavelet analysis (1)

Finite-element analysis – electrical and mechanical analysis (1)

7. *Class/laboratory schedule:*

One 50-minute lecture per week, followed by graded, weekly homework assignments involving computational exercises which reiterate and expand concepts presented in the lectures.

*Date of preparation and person(s) who prepared this description:*

C.C. Finley, February 9, 2006