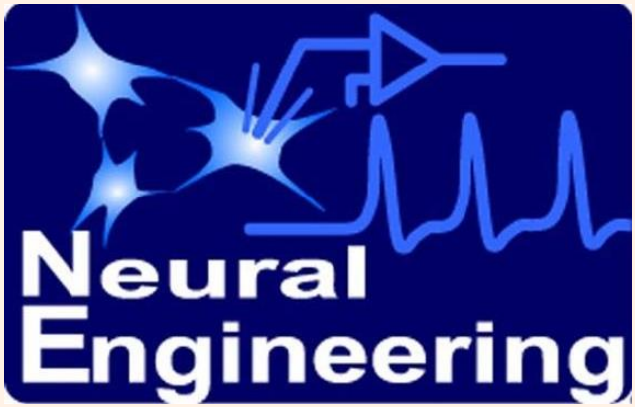
JEB1444S - SPRING TERM



OUTLINE:

Neural Engineering is an emerging field of research at the crossroads of neuroscience, electrophysiology, signal processing, computer science and nonlinear science. *Neural Systems* exhibit an amazing variety of instabilities, fluctuations, richness of forms and structures. They can be modeled at the *micro & macro* levels using parametric & nonparametric methods based on differential & integral equations, respectively.

Topics covered in the course include the following:

- A general perspective of neurobiology and neural engineering.
- Parametric neural models described by nonlinear rate processes.
- Nonparametric neural models described by the Volterra-Wiener approach.
- Applications to neuronal systems.

Two computer-based projects, dealing with parametric and non-parametric models of a neural system, provide hands on experiences to supplement the lectures.

EVALUATION:

Two computer-based projects, dealing with parametric & non-parametric models of a neural system.