Presenter: Roxane Mehrassa

Class Standing: Senior

Department: Applied Mathematics

College: Science

Faculty Mentor: Dr. Ioana Mihaila

Presentation Type: Oral presentation

Project Title: The Impact of Alcohol on Neuron Firing

Synopsis: Studying the effects that consuming alcohol has on brain cells (neurons) in a quantitative way using mathematical modeling using ordinary differential equations.

Abstract: Alcohol use has immediate, apparent effects on the brain and body, which some users consider to be positive (i.e. having a drink to loosen up or feel more confident). However, there can be serious repercussions after repeated and frequent use, particularly on the brain and its' neurons. Neurons are the electrically excitable cells that process and transmit information through electrical and chemical signals. In 1952, a mathematical model was developed to examine the firings of the brains neurons, and we will use a modified version of this model which will incorporate the effects of alcohol. We will analyze these modified equations (referred to as the Fitzhugh-Nagumo equations) using computer simulations.