J. Sargeant Reynolds Community College
Course Content Summary

Course Prefix and Number: EGR 295 **Credits: 1**

Course Title: Topics in Signals and Systems Laboratory

Course Description (including lecture hours, lab hours, total contacts)

Utilizes high-level software, such as Matlab ®, to formulate and analyze computer models of complex Engineering signals and systems. Covers the following topics: vector manipulation, plotting, function creation, complex numbers, difference equations, convolution, Fourier Series, DTMF modulation and demodulation, analog filters, frequency response, and sampling and reconstruction. Laboratory 3 hours per week.

General Course Purpose

This is a required companion lab course for EGR 261 – Signals and Systems. The software will be used to provide hands-on design and analysis experiences for the students. It will serve to "bring to life" the charts, tables and equations in the EGR 261 text.

Course Prerequisites/Corequisites (E*ntry-level competencies* ***required*** *for enrollment*)
Corequisite: EGR 261 – Signals and Systems.

Course Objectives
Upon completing the course, the student will be able to perform the following in Matlab ® or equivalent software:

- Create and manipulate vectors
- Develop plots and sub-plots
- Develop functions
- Manipulate complex numbers
- Manipulate and plot signal models using difference equations
- Convolve signals
- Develop, utilize, plot and interpret Fourier Series models of signals
- Understand and demonstrate DTMF modulation and demodulation
- Understand and demonstrate analog filter models and frequency response of systems
- Understand and demonstrate signal sampling and reconstruction.

Major Topics to be Included

- vector manipulation
- plotting
- function creation
- complex numbers
- difference equations
- Convolution
- Fourier Series
- DTMF modulation and demodulation
- analog filters
- frequency response
- sampling and reconstruction.

Effective Date of Course Content Summary: January 1, 2008