GEN_ENG 205-3 – Engineering Analysis III
Spring Quarter 2017

Catalog Description: Dynamic behavior of the elements. Modeling of mechanical (both translational and rotational), electrical, thermal, hydraulic, and chemical systems composed of those elements.

Textbook: Online textbook, http://othello.mech.northwestern.edu/ea3/ (Other detailed course information is also available.)

Instructors: Sandip Ghosal, Manohar Kulkarni, Kyoo-Chul (Kenneth) Park

Prerequisites: C- or better in 205-2.

Learning Objectives: Students will be able to model dynamic systems in several domains, focusing on mechanical and electrical systems. Students will apply analytical and computational techniques of solution to study the motion of these systems.

Functional Outcomes: Students will:
- Learn to associate physical phenomena and their mathematical description.
- Learn understand that the same mathematical equations can model different physical phenomena.
- Model mechanical systems using mechanical diagrams and free body diagrams.
- Apply appropriate simplifications to models.
- Model electrical systems using circuit diagrams.
- Reduce modeled systems to systems of differential equations.
- Solve and describe the solution of equations of motion using analytic as well as computational techniques.
- Apply eigenvalue analysis to systems with multiple degrees of freedom.

Basis of Grade: Weekly homework 15% (regular) + 5% (special topics)
Three quizzes 40% + 40% (lowest quiz score is weighed to 0%).

Computer usage: Many homework exercises use MATLAB.
Background material acquired via the Internet.
Report is to contain both text and graphical material.

Laboratory Exercises: There are table-top demonstrations in class.

Contribution to Professional Component:
Mathematics; basic sciences 80%
Engineering Topics 20%
General Education 0%

Prepared by: Prof. Kyoo-Chul (Kenneth) Park Date: Mar 26, 2017