

# EE 742 – Power System Dynamics, Stability and Control

**Instructor:** Dr. Y. Baghzouz

**Office Room #** SEB-2167

**Tel. #** 895-0887

**Fax #** 895-4075

**Email address:** Yahia.Baghzouz@unlv.edu

**Office Hours:** Monday: 11:00-12:00 and 1:30-2:30

Tuesday & Thursday: 11:0-12:00 and 1:00-2:30

**Book Title:** J. Machowsk, J.W. Bialek, J.R. Bumby, *Power system dynamics, stability and control*, John Wiley & Sons, 2<sup>rd</sup> Edition (2008) ISBN978-0-470-72558-0

## References:

1. Power system stability and control / P. Kundur ; edited by Neal J. Balu, Mark G. Lauby, McGraw-Hill, 1994
2. Power systems dynamics: Stability and control / K.R. Padiyar, BS Publications, 2008
3. Power system control and Stability P.M. Anderson, A.A. Fouad, Iowa State University Press, 1977.
4. IEEE Transactions on Power Systems

## Pre- and Co-requisites:

Pre-requisite: undergraduate electric machines and power systems course

## Course Content:

1. **Introduction to Power Systems**
  - a. Overview/Introduction
  - b. Power System Components
  - c. Steady-State Analysis
  - d. Role of P/f and Q/V relations
  - e. Classification of power system dynamics
2. **Power System Dynamics**
  - a. Electromagnetic phenomena
  - b. Electromechanical dynamics – small disturbances
  - c. Electromechanical dynamics – large disturbances
  - d. Photovoltaic Power
  - e. Wind power
  - f. Voltage stability
  - g. Frequency control
  - h. Stability enhancement
3. **Advanced Topics in Power System Dynamics**
  - a. Advanced Power System Modeling

- b. Steady-State Stability of Multi-Machine System
- c. Modeling of advanced PV inverters
- d. Power System Dynamic Simulation
- e. Power System Model Reduction – Equivalent

**Computer Usage:**

PowerWorld

**Tests:**

		<b>Value</b>
Midterm	TBA	25 Pts
Project	TBA	25 Pts
Homework	TBA	25 Pts
Final	TBA	25 Pts
<b>Total</b>		<b>100 Points</b>

**Grading:**

A ≥ 80 > B ≥ 65 > C ≥ 50 > D ≥ 35

**Notes:**

- Parts of the tests and final exam will be done at home.
- There will be no make-up tests.
- Class attendance and participation is highly encouraged.

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