POWER ELECTRONICS: EE 528
Fall 2014

Andras Kuthi, Ph.D.
Office: SSC 422   TA: Wei Wang,
Email: kuthi@usc.edu   e-mail: wang194@uac.edu
Voicemail: (213) 740 7627   Phone: 213.271.4134 (weekdays only)
Lecture: Tue., Thu. 9:30 – 10:50am, VHE 217   Office hour: 5:00-6:00 PM, Mon and Thur,
Office hours: Mon., Wed., 8 – 9am, SSC 422   SSC 316

Course Summary: The course will focus on analysis and design of switched-mode power converters: basic circuit operation, steady-state converter analysis and transformer-isolated converters. Control systems, including ac modeling of converters using averaged methods, small signal transfer functions, and classical feedback loop design will also be covered. Other essential parts of power electronics design such as basic magnetics, inductor and transformer design and EMI and grounding principles will complete the course.

Course text:
"Fundamentals of Power Electronics", Second edition, R.W. Erickson and D. Maksimovic, University of Colorado, Boulder. Publisher: Springer Science+Business Media Inc., 912 pages, ISBN 0-7923-7270-0.

COURSE OUTLINE
8/26   Introduction
8/28   Principles of Steady State Converter Analysis
9/2, 9/4   Steady-State Equivalent Circuits, Losses, and Efficiency
9/9, 9/11   Power Semiconductor Devices
9/16, 9/18   Discontinuous Conduction
9/23, 9/25   Converter Circuit Families
9/30, 10/2   AC Equivalent Circuit Modeling
10/7, 10/9   Converter Transfer Functions
10/14, 10/16   Controller Design, Feedback, and Stability
10/21,   MIDTERM
10/23   Regulator Design, PID controller
10/28, 10/30   Input Filter Design
11/4, 11/6   Resonant Converters
11/11, 11/13   Basic Magnetics Theory
11/18, 11/20   Inductor Design
11/25,   Transformer Design
12/2, 12/4   Layout and grounding principles
12/11 – 11am -1pm   FINAL EXAM,

Grading:
Homework (weekly) 20%, Midterm 30%, Final 50%.