

SYLLABUS
POWER ELECTRONICS: EE 528
Fall 2013

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Lecture: Tue., Thu. 9:30 – 10:50am, THH 213

Office hours: Mon., Wed., 8 – 9am, SSC 422

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Phone: (213) 271 4134 (weekdays only)

Office hour: Tue. 3:40-4:40pm, 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

8/27	Introduction
8/29	Principles of Steady State Converter Analysis
9/3, 9/5	Steady-State Equivalent Circuits, Losses, and Efficiency
9/10, 9/12	Power Semiconductor Devices
9/17, 9/19	Discontinuous Conduction
9/24, 9/26	Converter Circuit Families
10/1, 10/3	AC Equivalent Circuit Modeling
10/8, 10/10	Converter Transfer Functions
10/15, 10/17	Controller Design, Feedback, and Stability
10/22,	MIDTERM
10/24	Regulator Design
10/29, 10/31	PID controller
11/5, 11/7	Resonant Converters
11/12, 11/14	Basic Magnetics Theory
11/19, 11/21	Inductor Design
11/26,	Transformer Design
12/3, 12/5	Layout and grounding principles
12/11 – 12/18	FINAL EXAM, place and time tdb.

Grading:

Homework (weekly) 30%, Midterm 30%, Final 40%.