ECE445/545
Power Electronic System Design I

Class: Mon. and Wed. 2:00-3:40

Instructor: R. Tymerski, FAB160-18, O.H. TBA

Text: “Fundamentals of Power Electronics”, R.W. Erickson. A set of notes on which the lectures will be based are also available. These notes also contain homework problems and solutions as well as a sample exam with solutions.

Grading:
- Quizzes (3): 65%
- Projects: 35%

Quizzes: Each quiz will be on Wednesday of the following weeks of the term:
- Quiz #1 (20%): week 4
- Quiz #2 (20%): week 7
- Quiz #3 (25%): week 10

Be sure to be aware of the dates of the quizzes. No make-up for quizzes will be given. The final will be comprehensive.

In this introductory course the focus will be on dc-to-dc power converters whose topologies form a basis for topologies in the other areas of power processing.

The first term (ECE445/545) will be devoted almost exclusively to the steady state analysis of converters. This is covered in Part I (Chapters 1-6) of Erickson’s book. The second term (ECE446/546) will examine issues related to incorporating feedback control in the power converter system. This is covered in Part II (Chapters 7-9) of Erickson’s book.

Course outline of ECE445/545:
- Basic dc-to-dc converter topologies
- State space description of converters
- Accurate and approximate steady state analysis
- State ripple determination
- Effect of component parasitics
- Operating modes