

ECE 2750 Power Electronics Conversion Theory

Schedule

(date indicates the Monday of the corresponding week)

Week 1 (Jan. 9)	Introduction. Course description. The electric grid vs. microgrids: technical and historic perspective. The “Energy Internet.” Review of fundamental concepts for this course.
Week 2 (Jan. 16)	<i>No class (Dr. MLK birthday observance)</i>
Week 3 (Jan. 23)*	Distributed Generation units. Microturbines, reciprocating engines, wind generators, photovoltaic generators, fuel cells, and other technologies.
Week 4 (Jan. 30)*	Distributed Generation units. Microturbines, reciprocating engines, wind generators, photovoltaic generators, fuel cells, and other technologies.
Week 5 (Feb. 6)	Energy Storage – batteries, fly-wheels, ultracapacitors, and other technologies.
Week 6 (Feb. 13)*	Energy Storage – batteries, fly-wheels, ultracapacitors, and other technologies.
Week 7 (Feb. 20)	Power electronics interfaces: multiple and single input dc-dc converters.
Week 8 (Feb. 27)*	Power electronics interfaces: ac-dc and dc-ac.
Week 9 (March 6)	<i>Spring Recess.</i>
Week 10 (March 13)*	Power architectures: distributed and centralized. Dc and ac distribution systems. Stability and protections.
Week 11 (March 20)	Controls: distributed, decentralized, autonomous, and centralized systems. Operation.
Week 12 (March 27)*	Reliability, availability and resilience.
Week 13 (April 3)	Microgrids economics
Week 14 (April 10)*	Grid interconnection. Issues, planning, advantages and disadvantages both for the grid and the microgrid. Microgrids as part of smart grids.
Week 15 (April 17)	Course review.

Note about the schedule: Italics indicate weeks when the instructor will be attending conferences or may be unable to teach from the classroom. However, some additional trips unknown at this time may come up during the course of the semester. For example, due to the particular nature of his research Dr. K may need to travel to disaster areas on short notice. Although Dr. K will communicate these trips in advance along with any potential changes that these trips may cause, it is not possible to know at this time when those trips may occur. Still, provisions will be taken so no lecture classes are missed.

Asterisks indicate weeks when homework assignments are likely to be assigned.