



The University of Texas at El Paso
Department of Electrical and Computer Engineering
EE 5384 – Advanced Power System Economics

Instructor: Yuanrui Sang

Email: ysang@utep.edu

Phone: (915) 747-6632

Office: Engineering Building, Room A-334

Office Hours: by appointment

Course Description: National Academy of Engineering refers to the North American electric power grid as the largest and most complex machines that has ever been built. Interconnectivity of this system is the main source of complexity, connecting a large geographical area through over 200,000 miles of high voltage transmission lines. This course focuses on optimization algorithms in the operations of electricity markets and discusses the unit commitment, multi-period DCOPF, reserve scheduling, frequency regulation, and optimization of flexible transmission technologies in a long-term horizon. After taking this course, the students should have a good understanding of the optimization algorithms behind electricity market operations.

Textbook: There is no required textbook for this course. I will upload all class notes to Blackboard and everything will be covered in the class notes. The following book can be used as a reference for part of the course material: *Allen Wood, Bruce Wollenberg, and Gerald Sheblé, "Power Generation, Operation, and Control," 3rd Edition, New York: Wiley, 2013.*

Topics to be Covered:

1. A review of electricity market and optimal power flow
2. A review of linear optimization and programming skills needed for this course
3. Programming skills that are needed for this course
4. Multi-period DCOPF
5. Unit commitment
6. Reserve scheduling in power system operations
7. Frequency regulation
8. Stochastic optimization
9. Stochastic optimization with transmission switching
10. Stochastic optimization with TCSC
11. Stochastic optimization with SSSC

Grading Policy:

90 – 100	A
80 – 89	B
70 – 79	C
60 – 70	D
< 60	F



Homework	30%, if for some reason you cannot finish the homework on the due date, the grade will be reduced proportionately to the days passed after the due date (10% off for each day passed).
Two Exams	30% each
Attendance	10%, each unexcused absence takes 3%.

Policy on Scholastic Dishonesty: Students are expected to be above reproach in all scholastic activities. Students who engage in scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and dismissal from the university. Scholastic dishonesty includes but is not limited to reproducing test or quiz materials from memory, copy/paste or Xerox, cheating, plagiarism, collusion, the submission for credit or any work or materials that are attributable in whole or in part to another person, taking an examination for another person, and any act designed to give unfair advantage to a student or the attempt to commit such acts. Regents' Rules and Regulations, Part One, Chapter VI, Section 3, Subsection 3.2, Subdivision 3.22. See detailed procedure in the Handbook of Operating Procedures (HOP) available in the Office of the Dean of Students.

Policy on Accommodations: If you have a condition, which may affect your ability to perform successfully in this course, you are encouraged to discuss this in confidence with me and/or the director of the Disabled Student Services. Written guidelines r/t accommodations from The Center for Accommodations and Support Services (CASS) must be submitted to the course manager in two weeks after the start of the course. If you have a disability and need classroom accommodations, please contact CASS at 747-5148, or by email to cass@utep.edu, or visit their office located in UTEP Union East, Room 106. For additional information, please visit the CASS website at www.sa.utep.edu/cass. *CASS' Staff are the only individuals who can validate and if need be, authorize accommodations for students with disabilities.*

Copyright Notice: Copyright law protects many of the materials that are posted within this course. These materials are only for the use of students enrolled in this course and only for the purpose of this course. They may not be further retained or disseminated.

COVID-19 Precautions

Please stay home if you have been diagnosed with COVID-19 or are experiencing COVID-19 symptoms. If you are feeling unwell, please let me know as soon as possible, so that we can work on appropriate accommodations. If you attend class in person, face covering is strongly recommended.