The Course:
The definition of the “Smart” electric power grid can vary widely, often depending on the perspective of the person defining it. I often describe the smart grid as involving the interaction/integration of at least the following disciplines:
1. Power Systems
2. Telecommunication Systems
3. Control Systems
4. Information Technology Systems

Becoming an expert in any one of these disciplines can be a significant undertaking. In addition, each of these disciplines have technological, economic/business, and regulatory/policy aspects that must be considered. To understand the successful integration of these disciplines into a truly smart grid requires that we adopt a systems view of the smart grid. This one credit seminar will be focused around expert industry guest speakers who will help us to understand these system issues and the solutions and challenges associate with them. These speakers will provide an introduction to their topic, help us to understand why this is an important element of the smart grid, discuss the current state of their topic and how this area relates to the large smart grid system. Speakers will be addressing the technical, economic and/or regulatory aspects of their topic.

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Office hours: Tues/Thursday 11:00-noon, or by appointment
Email is the most effective way to contact me.

Grading:
Grading for the course will be primarily based on student participation in the classroom and/or online discussions on each week’s topic as well as an individual paper or group presentation due near the end of the semester. Options for extra credit will be available.

Track A: Individual Paper
Track A consists of writing a paper individually. You can write about any topic addressed by an in-class speaker or a telecom/energy related topic. Please discuss your topic (in email or in person) with the instructor before you begin writing. The paper should be 5-7 pages in length and include citations. You can use any accepted citation format but please be consistent.

Track B: Group Presentation
Track B is completed in teams of no more than 3 students. Please discuss your topic, in person, with the instructor before you begin preparing extensively. Each team should select its own topic and sign up for a topic proposal session in February. During this session, the teams should be prepared to discuss:

- How the topic is interdisciplinary (with some business or policy aspects) and energy/telecom related.
- Preliminary research – describe your research up to this point. Students should have consulted a minimum of five reputable sources. Bring a printed list of sources already consulted, information from those sources, and a continuing research plan (additional sources and areas to explore).
- Complexity of the topic
- Division of work between team members

This initial session will last 20 minutes and will be graded based on the group’s level of preparation. Students will be given full credit if they have considered all of the points above and have a printed list of research already conducted. Also, email any relevant documents to the instructor a day in advance of the scheduled appointment. In April, each team will present to the class for 20 minutes with 5 minutes for Q&A. After your presentation, you are expected to watch the video and submit a written critique of your individual performance (things you did well and things you could improve upon). Were you surprised by anything when you watched the video? Also, discuss how well your group worked together and whether everyone did his/her share of the work. Critiques should be 250 - 500 words in length.

**Topics covered may include, but are not limited to:**

- Demand Response (DR)
- Distribution Automation (DA)
- Integration of Distributed Generation (DG) into the power grid
- Integration of Electric Vehicles into the power grid
- Cybersecurity
- Microgrids and islanding
- Energy Management Systems
- Advanced Metering Infrastructure (AMI)
- Critical Infrastructure Protection (CIP)
- Conservative Voltage Control (CVC)
- Supervisory Control and Data Acquisition Systems (SCADA)

**Desire2Learn:**
Course materials, including homework, handouts and readings will be available to all students through Desire2Learn (D2L).

- [http://learn.colorado.edu](http://learn.colorado.edu)

**Online access to recorded classes:**
Online access to recorded classes is available to both distance and on campus students at:

- [http://cuengineeringonline.colorado.edu](http://cuengineeringonline.colorado.edu)
Recordings should be available within 24 hours of the live class.

The following statements can be summarized simply: We expect you to behave professionally and feel free to contact me if you have any special needs or concerns.

If you qualify for accommodations because of a disability, please submit to your professor a letter from Disability Services in a timely manner (for exam accommodations provide your letter at least one week prior to the exam) so that your needs can be addressed. Disability Services determines accommodations based on documented disabilities. Contact Disability Services at 303-492-8671 or by e-mail at dsinfo@colorado.edu.

If you have a temporary medical condition or injury, see Temporary Injuries under Quick Links at Disability Services website (http://disabilityservices.colorado.edu/) and discuss your needs with your professor.

Campus policy regarding religious observances requires that faculty make every effort to deal reasonably and fairly with all students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. See full details at http://www.colorado.edu/policies/fac_relig.html

Students and faculty each have responsibility for maintaining an appropriate learning environment. Those who fail to adhere to such behavioral standards may be subject to discipline. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with differences of race, color, culture, religion, creed, politics, veteran’s status, sexual orientation, gender, gender identity and gender expression, age, disability, and nationalities. Class rosters are provided to the instructor with the student’s legal name. I will gladly honor your request to address you by an alternate name or gender pronoun. Please advise me of this preference early in the semester so that I may make appropriate changes to my records. See policies at http://www.colorado.edu/policies/classbehavior.html and at http://www.colorado.edu/studentaffairs/judicialaffairs/code.html#student_code

The University of Colorado Boulder (CU-Boulder) is committed to maintaining a positive learning, working, and living environment. The University of Colorado does not discriminate on the basis of race, color, national origin, sex, age, disability, creed, religion, sexual orientation, or veteran status in admission and access to, and treatment and employment in, its educational programs and activities. (Regent Law, Article 10, amended 11/8/2001). CU-Boulder will not tolerate acts of discrimination or harassment based upon Protected Classes or related retaliation against or by any employee or student. For purposes of this CU-Boulder policy, “Protected Classes” refers to race, color, national origin, sex, pregnancy, age, disability, creed, religion, sexual orientation, gender identity, gender expression, or veteran status. Individuals who believe they have been discriminated against should contact the Office of Discrimination and Harassment (ODH) at 303-492-2127 or the Office of Student Conduct (OSC) at 303-492-5550. Information about the ODH, the above referenced policies, and the campus resources available to assist individuals regarding discrimination or harassment can be obtained at http://hr.colorado.edu/dh/

All students of the University of Colorado at Boulder are responsible for knowing and adhering to the academic integrity policy of this institution. Violations of this policy may include: cheating, plagiarism, aid of academic dishonesty, fabrication, lying, bribery, and threatening behavior. All incidents of academic misconduct shall be reported to the Honor Code Council (honor@colorado.edu; 303-735-2273). Students who are found to be in violation of the academic integrity policy will be subject to both academic sanctions from the faculty member and non-academic sanctions (including but not limited to university probation, suspension, or expulsion). Other information on the Honor Code can be found at http://www.colorado.edu/policies/honor.html and at http://honorcode.colorado.edu

- When in doubt, Ask Early!