Goals, Requirements, and Expectations of PUPB 8833:

Electrification, digitalization, and decentralization are transforming energy systems worldwide. This course will focus on the governance and policies impacting this transformation. It will cover approaches to integrated resource planning, rules around solar integration, rate setting, the 100% renewable energy movement, and the role of utility-scale power plants as well as resources on the customer side of the meter including roof-top solar, energy efficiency, demand response, and electric vehicles.

Students will learn how to use several analytical software tools and data sources to assess the cost-effectiveness of alternative electricity technologies, policies, and investments including:

- The levelized cost of electricity from alternative resources, based on data from Integrated Resource Plans and associated legal filings
- Application of California’s standard utility cost tests to energy efficiency programs and investments
- How electric rates and tariffs affect electric vehicle and solar economics, using NREL’s solar System Advisor Model (SAM)
- Impact of carbon taxes on electric vehicles, fossil fuels and air quality based on EIA’s National Energy Modeling System (NEMS)

The focus will be on U.S. systems, but there will be some case study coverage of several European countries as well as China.

Each student will complete one exercise, lead a discussion of several assigned readings, and write research paper. Students will present their research to their peers at the end of the term.

This is a discussion-based seminar course. Students are expected to have strong written and oral communication skills and experience with data analysis. Prior knowledge of utility regulation and policy is not necessary.

Course Texts:
A selection of relevant articles and data resources will be available on T-Square. Please read the assigned readings on time (prior to class).

Course grading:
Assessment and Grading
Student performance and grades are based on the following:

1) Class Participation: 10%
   This includes attendance, participation in discussion, and the degree to which students come to the course prepared to engage the material, their classmates, and the subject at hand.

2) Contributing to Class Discussions: 10%
   Each student will be assigned to cover some readings and to lead the discussion of them in class.

3) Exercise 1: 25%
   The first exercise will be assigned on September 4 and will be due October 16. It will be flexible to reflect the particular interests of students. Students will report the results of either Exercise 1 or Exercise 2 in class during the first half of the course.

4) Exercise 2: 25%
   The second exercise will be assigned on September 4 and will be due October 16. It will be flexible to reflect the particular interests of students. Students will report the results of either Exercise 1 or Exercise 2 in class during the first half of the course.

5) Research Presentation: 10%
   Each student will prepare a 20-minute presentation of the independent research they have conducted. The presentation will take place during the last week of classes.

6) Final Research Paper: 20%
   Each student will prepare an independent research paper of 20-30 pages investigating a topic of interest related to utility regulation. Each student should discuss their topic selection with the professor before submitting their problem statement.

Assignments and Due Dates

1. Exercise 1 (to be assigned on 9/4/2018) ..................................................... 10/11/2018
2. Exercise 2 (to be assigned on 10/4/2018) ................................................... 11/15/2018
3. Research Presentations ............................................................................... 11/20, 27, 29

All written assignments are to be submitted on T-square.

Communications:
I have office hours on T & Th at 11 am in my office, Room 312 in the D.M. Smith Building. You may also contact me to arrange to meet at other times. Please use a GA Tech email account for course communications and post all assignments on T-square.

Rights and Responsibilities
Enrollment in this course indicates that you have read, acknowledge and agree to abide by the following:

- Policy on academic performance and incompletes - see Georgia Tech School of Public Policy Student Handbook.
- Georgia Tech Honor Code - including Addendum for Graduate Students. You are informed that student papers may be reviewed by plagiarism detection software.

Enrollment for the course indicates that you agree to attend all scheduled classes. With instructor's permission, one or a few absences from class will be forgiven for good reason. Absences beyond this may result in a lower final grade.

Course Schedule

Introduction
Week 1
August 21 – Review Syllabus – Electricity Sector Overview


August 23 – Electricity System History and Governance in the U.S.

1 hour Video of Utility Ratemaking Workshop #1-Background (Southface Energy Institute and Vote Solar)


Levelized Cost of Electricity
Week 2
August 28 – Rate Setting

1 hour Video of Utility Ratemaking Workshop #2-Understanding the Utility Business Model and Rage Design (Southface Energy Institute and Vote Solar)

August 30 – Levelized Cost of Electricity


**Market Failures and Integrated Resource Planning**

Week 3 |

September 4 – Introduction to the SNL Energy Data Subscription

Georgia Tech Users’ Manual (Under Development)

September 6 – Integrated Resource Planning


*Choose a section of one of these three Integrated Resource Plans (IRPs) to read and review for class discussion.* Focus on a section of particular interest to you:

- 2017 Dominion IRP
- 2016 Tennessee Valley Authority IRP
- Georgia Power IRP

Week 4 |

September 11 – Market Failures and Barriers


September 13 – Net metering of Solar Power: Impacts on Rates and Equity Issues


**The 100 RE Movement**

Week 5 |

September 18 – The 100 RE (100% Renewable Energy) Movement

*Choose one of these for class discussion:*


Policy Diffusion Mechanisms Applied to Solar and Smart Grid Policies


Model Solar Ordinances (2 examples)

Week 6


Net Metering
September 27 – Net Metering + Data Session 1 on electricity sector data available from EIA


Demand-Side Programs
Week 7

October 2 – Introduction to the GT-National Energy Modeling System (NEMS)

Georgia Tech Users’ Manual (Under Development)


October 4 – Demand Response Benefits and Potential


Smart Meters and the Smart Grid
Week 8
October 9 – Fall Student Recess – No Class

October 11 – Smart Meters and the Smart Grid

Choose one to read for class discussion:

  


**Baseload Plants: Nuclear Power**

Week 9 |

October 16 – Concept of Baseload, Integration of VRE, and Nuclear Power


October 18 – Evolving Utility Business Models

- Various press coverage and materials on the VC Summer and Vogtle Nuclear Plants (see folder on T-square and pick a couple of articles to read)
  


**PV-Battery Systems & Vehicles to Grid (V2G)**

Week 10 |

October 23 – PV-Battery Systems


October 25 – Vehicles to Grid (V2G)

Choose one to read for class discussion:


Grid Reliability and Resilience

Week 11 |
October 30 – Reliability, Resilience, and Cyber Security

- DOE. 2017. *Staff Report to the Secretary on Electricity Markets and Reliability, Chapter 4: Reliability and Resilience* (pp. 61-101).
  https://www.eenews.net/assets/2017/08/24/document_gw_06.pdf

November 1– Mega Projects and the Politics of Niche-Regime Conflicts

Choose one to read for class discussion:


Risk, Precaution, and the Political Control of Regulator

Week 12 |
November 6 –


Environmental Regulations

November 8 –

  Read Chapter 2 on Air Quality.
Fall 2018

Energy Transitions
Week 13 | November 13 – Carbon Cap and Trade vs Carbon Taxes


November 15 – No Class

Week 14 | November 20 – Mega Projects and the Politics of Niche-Regime Conflicts


November 22 – Thanksgiving Break – No Class

Student Paper Presentations: November 20, 27, and 29

December 6 - 13 – Final Paper Due December 11, 2018

Possible Guest Lectures:

Mark G. Lauby, Senior VP and Chief Reliability Officer, North American Electric Reliability Corporation, mark.lauby@nerc.net
404-446-9723 (o) 404-895-1109 (c)

Bruce Edelston
Vice President, Energy Policy, Southern Company
Frank Lambert, NEETRAC

Additional suggested reading materials:

- Robert L. Rabin, “Federal Regulation in Historical Perspective.” Stanford Law Review, 38, May, 1986, 1189-1327. This is a rather succinct sweep of most American regulatory history, largely through the lens of the role of the courts. This article ends in the mid-1980s.
- McDonald, D. A. (2016). To corporatize or not to corporatize (and if so, how?). Utilities Policy, 40, 107-114.

Websites:
Teaching the Duck to Fly   http://www.raponline.org/document/download/id/7956
DOE Electricity Advisory Committee Websites:
https://www.energy.gov/oe/services/electricity-advisory-committee-eac/electricity-advisory-committee-reports-and-memos
https://www.energy.gov/oe/june-7-8-2017-meeting-electricity-advisory-committee

Blogs:
Blogs that are useful (but sometimes contentious) and that often point to insightful additional sources include:
- Penn Program on Regulation (Regblog):  http://www.regblog.org  (*highly recommended*)
- Center for Progressive Reform:  http://www.progressivereform.org/CPRBlog.cfm?idSect=27 (liberal)
- American Enterprise Institute:  https://www.aei.org/tag/regulation/ (conservative)

Key Policy Resources, Data Sources and Models
- IEA/IRENA Global Renewable Energy Policies and Measures Database
ACEEE Database of Energy Efficiency Policies
http://database.aceee.org/state-scorecard-rank
Electricity data from FERC, EIA, EPA’s E-Grid, PJM market data, ...
EIA’s NEMS, EPA’s AVERT, NREL’s SAM,...