Syllabus

Advances in Energy Modeling II

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	Position	Professor			Major	Energy Science and Policy
	Group	Energy Systems Research				

1. Course Description

This class is targeted to the students who took 'Introduction to Energy Modeling' class before. The final goal is to model a country's energy system and analyze scenarios.
GCAM data system will be explored in more detail than in the previous class. While studying GCAM data system, students will know i) how a single country input XML file was generated, ii) how a building sector structure could be disaggregated, iii) how a technology's specifications are represented.
End-use, power, AgLU (Agriculture&Land-Use) and water sectors will be explored.
Students will learn how to adjust key input parameters to create a reference energy system within GCAM-EML.
Students will know general concepts of SSP (Shared Socioeconomics Pathways) and RCP (Representative Concentration Pathway) scenarios in terms of input data and how to visualize the global scenarios.
GCAM's model ecosystem will be introduced since GCAM could be used with other models together, too. The GCAM ecosystem is a suite of models and tools.
Finally, students will present their final projects.

2. Teaching Methods

Lecture, Exercise and presentation by students
Hands on experience with GCAM and GCAM-EML software

3. Evaluation

Midterm exam (40)
Final report (50)
Attendance (10)
Total (100)

4. Textbooks

Main/Sub	Title	Writer	Publisher	Publication year
	GCAM: http://www.globalchange.umd.edu/gcam/			
	GCAM: https://github.com/JGCRI/gcam-core			
	GCAM building paper (2014). A long-term, integrated impact assessment of alternative building energy code scenarios in China.	Yu, S., Eom, J., Evans, M., & Clarke, L.	Energy Policy, 67, 626-639.	
	GCAM transportation paper (2011). Long-term implications of alternative light-duty vehicle technologies for global greenhouse gas emissions and primary energy demands.	Kyle, P., & Kim, S. H.	Energy Policy, 39(5), 3012-3024.	
	R: https://www.r-project.org/about.html			
	Data Science: https://www.datacamp.com/			

5. Lecture Schedule

Week	Lecture contents	Lesson type	Remark
1	GCAM Data System (1)	Lecture	Dr. Seungho Jeon
2	GCAM Data System (2)	Lecture	Dr. Seungho Jeon
3	GCAM Data System (3)	Lecture	Dr. Seungho Jeon
4	End-use Sectors in GCAM	Lecture	Dr. Seungho Jeon
5	Power Sector in GCAM	Lecture	Dr. Seungho Jeon
6	AgLU Sector in GCAM	Lecture	Dr. Seungho Jeon
7	Water Sector in GCAM	Lecture	Prof. Jake Oh
8	Midterm exam		Prof. Jake Oh (1/2) Dr. Seungho Jeon (1/2)
9	Adjustments of key input parameters within GCAM-EML (1)	Lecture	Prof. Jake Oh
10	Adjustments of key input parameters within GCAM-EML (2)	Lecture	Prof. Jake Oh
11	Adjustments of key input parameters within GCAM-EML (3)	Lecture	Prof. Jake Oh
12	Shared Socioeconomics Pathway (SSP) & Representative Concentration Pathway (RCP)	Lecture	Prof. Jake Oh
13	Ecosystem of GCAM model	Lecture	Prof. Jake Oh
14	Presentation of final projects	presentation by students	Prof. Jake Oh (1/2) Dr. Seungho Jeon (1/2)
15	Presentation of final projects	presentation by students	Prof. Jake Oh (1/2) Dr. Seungho Jeon (1/2)

5. Lecture Schedule

Week	Lecture contents	Lesson type	Remark
16	Final exam		Prof. Jake Oh (1/2) Dr. Seungho Jeon (1/2)

6. Others