INFRASTRUCTURE AND UTILITY MANAGEMENT

CIVE 578 - SPRING 2015 (3:00-3:50 pm MWF (B 2 Engineering)

Sustainable transportation, energy, water, and waste systems

Infrastructure and the economy

The need for new and renewed infrastructure systems to support economies and meet social and environmental needs is a common global theme. Planning, financing, and implementing these systems present special challenges in an age of transformation with many competing needs. The course prepares students to plan and manage these systems in civil engineering, construction, and public works jobs relating to systems for the built environment, transportation, energy, water, waste management and resource recovery, and communications. Basic principles of planning and management are presented, and each student prepares and presents a case study.

Topics covered

- Civil infrastructure systems and systems approach
- Built environment (above and underground)
- Urban and regional planning for sustainable cities
- Growth management and infrastructure planning
- Financial strategy for infrastructure systems
- The Price of Government: emphasis on current budget systems
- Privatization of infrastructure
- Asset management in infrastructure systems
- Government budgeting, service sector productivity, reinventing government
- Public works and utility structure and management
- Infrastructure security and emergency management
- Politics and social aspects of infrastructure
- Public sector economics and industrial policy
- Infrastructure and utility law and regulation
- Project management, operation and maintenance
- Workforce and knowledge management in the public sector

Instructor: Neil S. Grigg, 491-3369; neilg@engr.colostate.edu
Course materials and information on textbook

You are not required to buy any textbooks. Rather than a standard textbook, the class draws from many sources and topics, which are integrated on the powerpoint presentations, along with posting of up-to-date documents and references to websites. Text material will be drawn from instructor notes and recent research papers and web-based materials from the infrastructure management community.

Here is a description of some helpful resource materials:

**Infrastructure management.** This is a broad topic that draws from engineering, public administration, and related fields. I published a book on the topic over 20 years ago, and will distribute to you over the web some updated chapters. This book is titled: Infrastructure Engineering and Management, John Wiley & Sons, 1988. It is available in the CSU library, but is outdated for the most part. I published a more recent book entitled Infrastructure Finance: the business of infrastructure for a sustainable future, John Wiley & Sons, 2010. You’ll receive some materials from it over the web as we go along.

**Utility management.** A rich set of materials about the utility industry (electric power, water, natural gas) is available, and good sources to consult are from the relevant think tanks, associations, and government agencies. I’ll be identifying these during the semester.

**Infrastructure security.** The Department of Homeland Security is a good source for these materials.

**Policy topics.** A lot of the material we’ll study is related to infrastructure policy and problem-solving. There are many reports to consult, from development banks, government agencies, and commercial firms seeking to develop products for the infrastructure industry. I’ll be providing a list of these and their sources as we go through the semester.

I’ll be adding much more material to these, and if you would like more detail on any of these let me know.
Course procedures

General procedures
This is a 500-level course of the Department of Civil and Environmental Engineering, open to graduate and advanced undergraduate students. Because civil engineers and public administrators deal with many infrastructure management issues, this course has broad coverage rather than depth in a single technical area. Because of its emphasis on real situations, case studies are used along with new lecture material. In addition to cases presented by the instructor, students prepare and present cases to the class.

Use of RamCT for distance and in-class students
Rather than having a standard textbook, the class draws from many sources and topics, which are integrated on the powerpoint presentations, along with posting of up-to-date documents and references to websites. RamCT will be used to post all lecture material, assignments, and other information. I will try to post each day’s lecture by noon of the day of class.

Distance students view each day’s lecture and complete all assignments. The only difference between distance and in-class students is actual attendance in the classroom.

Grading procedures
Grading weights are:

<table>
<thead>
<tr>
<th>Weight</th>
<th>Component</th>
</tr>
</thead>
<tbody>
<tr>
<td>40%</td>
<td>Hour exams (3 mid-terms)</td>
</tr>
<tr>
<td>40%</td>
<td>Homework, including class paper (25% of homework grade)**</td>
</tr>
<tr>
<td>20%</td>
<td>Final exam</td>
</tr>
</tbody>
</table>

** Homework grades may be increased or decreased by 10% due to high or low levels of class participation.

Normally, I give a tentative grade on the last day of class (based on 50-50 homework/paper and exams). Students can accept the grade or take the option of taking the final exam to try to improve it.

Standards for performance
Students are expected to perform as professionals in the class. This means they should attend, express interest, ask questions, and behave as they would in a business environment.

Academic Integrity
Colorado State University takes academic integrity seriously and requires that no one will use another's work as their own. Of course, academic integrity means more than just avoiding plagiarism. It also involves doing your own reading and studying. It includes regular class attendance, careful consideration of all class materials, and engagement with the class and your fellow students. Any violation of academic integrity will be addressed according to university procedures.