

# INFRASTRUCTURE AND UTILITY MANAGEMENT

***CIVE 578 - SPRING 2018 (3:00-3:50 pm MWF (B 2 Engineering)***

## **Sustainable transportation, energy, water, and waste systems**

Infrastructure is the constructed foundation for society and utilities deliver essential services for water, energy and waste management. The course prepares students to manage infrastructure and utility systems in civil engineering, construction, and public works management jobs. Sustainability is a key element in infrastructure and utility management and is embedded in the course from planning through resilience concepts used by cities and other infrastructure managers. Metrics for sustainability are through Triple Bottom Line measures of economic-social-environmental outcomes. Each student prepares and presents a case study.

### **Topics covered**

- Civil infrastructure systems approach
- Urban and regional planning for sustainable cities
- TBL tools such as Envision
- Growth management and infrastructure planning
- Financial strategy for infrastructure systems
- The Price of Government: emphasis on budget systems
- Public-private-partnerships in infrastructure
- Asset management in infrastructure systems
- Service sector productivity and 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

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## **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.

**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 updated material from it will be distributed to you. The book is titled: *Infrastructure Engineering and Management*, John Wiley & Sons, 1988 and is available in the CSU library. 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 as well.

**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.

# CIVE 578 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 Canvas 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. All lecture material, assignments, and other information will be posted on Canvas. Normally I 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:

50%	Hour exams (3 mid-terms)
30%	Homework, including class paper (paper is 25% of homework grade)
20%	Final exam

## Optional final exam

I give a tentative grade on the last day of class (based on 50-30 exams and homework/paper). Students can accept the grade or take the final exam to try to improve it without risk of lowering the tentative grade.

## 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.