Objective - Introduce students to the functionality, planning, design, and operation of key infrastructure systems which underlie contemporary society. The course is taught through a series of examples, beginning with the theory and concepts associated with a particular system type, and culminating each week in a field visit to an example system.

The theoretical and conceptual elements include

- objectives and functions for systems
- system organizations and interactions
- design characteristics and the factors that determine them
- finance and ownership patterns
- supporting institutional frameworks
- contemporary problems and options

Course Operations - These elements of infrastructure are covered in a lecture-discussion format during a two-hour class once a week. Students complete weekly written assignments analyzing current problems or proposals for the infrastructure system which serves as the focus for the week. Students will also work in small teams to engage in the planning and conceptual design of a real or realistic infrastructure system. Student design products will be delivered at the end of the course in written form supported with an oral briefing.

In addition to the weekly class a field trip each week will visit infrastructure facilities in the Chicago Metropolitan area. Trips will be led by the instructors along with on-site managers and engineers to give students a true insider's view of each system.

The following schedule is current as of the start of classes March 30, but is subject to change.

March 30 – Welcome to CEE 382: What is infrastructure? & Highways

April 2 – Project Management Class – Speaker from RISE group on project management and brief tutorial on use of Microsoft Project software to manage and report on team design projects
April 6 – Public transportation systems

April 9 – Tour of CTA rapid transit system on chartered CTA train – Depart from Noyes Street station at 12:15 pm (Arrive on platform no later than 12:10 pm). Will also stop at Davis Street at 12:20 pm.

April 13 – Aviation and airport systems

April 16 – Tour of Midway Airport development projects – Depart on bus from Sheridan Road side of Tech at 12:10 pm. Projected return: 4:00 pm

April 20 – For-Profit Infrastructure: Office, industrial, and residential developments, shopping centers, etc.

April 23 – Visit to Bovis Lend Lease construction management firm and tour of downtown Chicago office building construction project – Depart on bus from Sheridan Road side of Tech at 12:10 pm. Projected return: 4:30 pm

April 27 – Infrastructure Planning Principles & System Operations and Monitoring

April 30 – (tentative) Tour of CTA Red Line Dan Ryan power distribution system renewal – Gather on Noyes Street CTA platform by 12:10 pm. Take regular service Purple Line train to Howard and transfer to Red Line train for 87th Street station. Meet CTA representatives on platform for discussion of project. Project return: 4:30 pm

May 4 – Water and Sewer Treatment and Transport Systems Sewer, water, etc.

May 7 – Tour of Chicago shoreline erosion protection project – Depart on bus from Sheridan Road side of Tech at 12:10 pm. Projected return: 4:00 pm

May 11 – Non-Profit Special-Purpose Facilities: Sports stadiums, museums, zoos, etc.

May 14 – (tentative) Tour of Millennium Park in downtown Chicago – Depart on bus from Sheridan Road side of Tech at 12:10 pm. Projected return: 4:00 pm

May 18 – Railroad Systems and Operations

May 21 – Tour of BRC Clearing Yard – Depart on bus from Sheridan Road side of Tech at 12:10 pm. Projected return: 5:00 pm
May 25 – Bridges & Toll Facilities

May 28 – Design Project Workshop – Prof Schulz will be available during the afternoon for consultation on design projects

June 1 – Ports and Waterways & Course Conclusion

June 5 – Chicago River tour – Depart on bus from Sheridan Road side of Tech at 12:10 pm. Projected return: 4:00 pm

June 8 – Student Team Design Project Presentations

“Blackboard” Web Site – We will build a course web site on Northwestern’s “Blackboard” site throughout quarter:

https://courses.northwestern.edu/

The site will include class notes, articles, handouts, notices. Class notes for each Tuesday will be put up on site no later than 5:00 p.m. Monday. Items of interest for students will be posted either in whole, or by URL

“Infrastructure in the News” - Students are requested to look through print and electronic media for stories concerning infrastructure. Send electronic version or URL to Ruth (r-allee@northwestern.edu) for posting on course “Blackboard.” If you can’t find electronic version, bring, send, or fax (847/467-2056) hard copy to Elizabeth Brasher at ITI office.

Team Design Project
• Organize a team
• Pick a project
• Meet weekly with instructor(s)
• Must utilize project management software
• Prepare design report
  ▪ Identify objectives, requirements, constraints, decisions, risks, options, barriers
• List problems & recommend how you would address them
• Prior years:
  ▪ Airport security
  ▪ Railroad grade crossing safety
  ▪ CTA “Circle Line”
  ▪ CTA Blue Line extension to Woodfield
  ▪ Redevelopment of US Steel South Works site
  ▪ Grant Park event infrastructure
• Resources
  ▪ Classroom discussions
- “Blackboard” Web site
- Readings
- Other Web sites
- Out-of-classroom discussions
- Knowledge Manager Ruth Allee
  - r-allee@northwestern.edu, 7-4637
- Access to “real world” contacts, agencies