# IOWA STATE UNIVERSITY Civil, Construction & Environmental Engineering

# CE 5940U: Introduction to Utility Engineering and Coordination

### Course Description:

Studies in utility infrastructure, utility investigations, utility construction methods, utility conflict analysis, and general utility design.

#### Prereq: Satisfaction of the College of Engineering Basic Program requirements.

This course will introduce students to the vast spectrum of utility infrastructure serving our communities. Various types of infrastructure, water, gas, telecommunications, electric, and more, will be discussed at a broad level to understand the basic details and functions of those systems. The interaction and coordination of these systems will be presented along with the associated coordination necessary with transportation and other civil infrastructure. Utility engineering will be presented as a branch of civil engineering which has been defined by the American Society of Civil Engineers. Utility investigations, construction methods (inclusive of trenchless technologies), as-built documentation, inspection, conflict analysis, and general design topics will be covered.

#### Course objectives (course designed to provide students with):

The course aims to introduce students to the complexity of utility infrastructure and the need to understand this infrastructure as it relates to services provided, resiliency and sustainability of those systems, and associated impacts and interactions with the built and natural environment.

## Course Outcomes (students should be able to):

- Explain utility engineering as a branch of civil engineering
- Identify utility-related surface features in the built environment
- Prepare utility conflict management study and utility conflict list
- List the steps of utility coordination and investigation within civil project development
- Describe the features and function of water utility infrastructure
- Describe the features and function of gas utility infrastructure
- Describe the features and function of electric utility infrastructure
- Describe the features and function of telecommunications utility infrastructure
- Describe the features and function of storm and sanitary sewer utility infrastructure
- Describe emerging technologies within utility infrastructure, such as renewable energy, cellular devices, electric vehicle needs, and electric grid modernization
- Apply utility risk analysis and explain impacts to associated infrastructure and projects
- Apply utility investigation and as-builting standards
- Develop a utility investigation study, associated inspection equipment and limitations; and coordination plan; and
- Describe utility construction methods and their associated impacts on utility investigation.