CE 454 – Soil and Site Improvement

Code and Name: CE 454 – Soil and Site improvement
Credit Hours: 3 (Lecture: 3, Tutorial: 1)

Textbook:
- Ground Improvement: Kirsch, k., & Bell, A. 3rd Edition, CRC Press, 2012

Other References:
- Das, B.M., Principles of Foundation Engineering, Cengage Learning, 7th edition 2011.

Course Description:
Problematic soils, Need of soil improvement, Methods and principles for improving engineering properties of soils, Mechanical, chemical, electrical and thermal stabilization, Use of geosynthetics in geotechnical and geo-environmental applications.

Pre-requisites: CE351 Geotechnical Engineering
Co-requisites: None

Course Learning Outcomes:
With relation to ABET Student Outcomes (From Fall 2019-SOs: 1-7)

1. Describe the methods to decide when to find another site / location, redesigning a structure, or removing troublesome ground at a project site (1)
2. Identify the methods to improve existing physical properties of soils to enable effective, economic, and safe construction to achieve appropriate engineering performance (1)
3. Explain recent developments in ground improvement techniques (7)
4. Predict appropriate engineering performance through site and soil improvement (6)
5. Explain relationships between soil stabilization methods and the desired engineering properties (6)
6. Evaluate ground contaminant control and the relevant remediation approaches (1)
7. Take responsibility for their own learning and continuing development as a geotechnical / foundation engineer (7)

Topics to be covered:

- Introduction to the problematic soils.
- Need of soil improvement.
- Methods and principles for improving engineering properties of soils.
- Mechanical stabilization.
- Chemical stabilization.
- Electrical, and thermal stabilization.
- Use of geosynthetic in geotechnical and geo-environmental applications.
- Contaminant control and remediation.

Grading Policy:
The grading for the course is: 60% coursework and 40% Final Exam. The course work consists of two Midterm Exams, where each midterm exam is worth 20%. It also includes quizzes, and projects for the remaining 20% that is modified by the course instructor.