

Fall 2015 – Course Announcement

Foundations–CEEN 415

3 Hours Credit, Room CO 212, Time: TR 12.30-1.45 pm

Instructor: D.V. Griffiths

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Office Hours: T 2-4 pm and by appointment

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A continuation of the Soil Mechanics sequence but with an emphasis on applications of soil mechanics principles in geotechnical engineering. Topics covered will include a review of effective stress and shear strength theory, subsurface exploration, earth pressures and design of retaining structures, slope stability analysis, bearing capacity, and design of shallow and deep foundations.

Course Outline:

- a Review of Shear strength and effective Stress:** Principle of effective stress. Short-term and long-term effects. Measurement of shear strength. Direct shear and triaxial testing. Mohr's circles of stress. Pore pressure parameters. " $\phi_u = 0$ " concept for undrained clays.
- b Subsurface exploration:** Methods of sampling and in-situ measurement. Water levels, vane shear, cone penetration and standard penetration test.
- c Earth pressures:** Earth pressures on smooth and rough walls. Active and passive states.
- d Bearing capacity:** Bearing capacity of shallow foundations. Bearing capacity factors. Influence of water table, eccentric and inclined loading.
- e Design of retaining walls:** Sliding, overturning and bearing capacity criteria. Mechanically stabilized retaining walls. Braced excavations.
- f Deep foundations:** Introduction to the design of piled foundations. Tip resistance, frictional resistance.
- g Slope stability:** The stability of slopes. Infinite slopes. Use of charts. Methods of slices.

Foundations—EGGN 464

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Pre-requisite: A first course in Soil Mechanics

Course textbook:

“Fundamentals of Geotechnical Engineering”, 4th ed., B.M. Das, 2013

Assessment and Grading Guidelines:

Exam 1	30%
Exam 2	30%
Final	40%
90% $\leq$	A
80% $\leq$	B < 90%
70% $\leq$	C < 80%
60% $\leq$	D < 70%
	F < 60%

- No make-up exams unless sanctioned by the Registrar.
- All exams are open-book, open-notes.

Provisional schedule:

Topic	Weeks
Effective stress and shear strength	1–2
Subsurface exploration	3
Earth pressures	4–6
Bearing Capacity	7–8
Retaining walls	9–11
Deep Foundations	12–13
Slope stability	14–15