CEE 271
Unsaturated Zone Hydrology

Instructor

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Office Hours: By Appointment
Lecture, 1 hour; discussion, 20 minutes: SB2 223

Prerequisite(s):

Course Description:
Physical properties of the soil, soil characterization, formation, soil water retention curve, unsaturated soil hydraulic conductivity curve, measurement of soil moisture content and soil water pressure head, Richards' equation, Darcy's Law, capillary flow, spatial variability of soil properties, analytical solutions for horizontal and vertical infiltration, movement of water, heat, and gas through soil.

Recommended books:
David E. Radcliffe, and Jiři Šimůnek, Soil Physics with HYDRUS, CRC Press, Taylor & Francis, 2010, ISBN Number: 978-1-4200-7380-5
P. Koorevaar, G. Menelik, and C. Dirksen, Elements of Soil Physics, Elsevier Science B.V., Fifth Impression, ISBN Number: 0-444-42242-0

Outline:

Introduction

1) Soil physical properties

2) Soil-water potential – concepts and measurement

3) Soil physical experiments

4) Saturated soil water flow

5) Unsaturated soil water flow

6) Field soil water regime

7) Spatial variability of soil physical properties

8) Heat transfer

9) Gas flow

Course Schedule:

Date	Day	Section
September 24	Thursday	0
September 29	Tuesday	1
October 1	Thursday	2
October 6	Tuesday	2
October 8	Thursday	3
October 13	Tuesday	3
October 15	Thursday	4
October 20	Tuesday	4
October 22	Thursday	5
October 27	Tuesday	5
October 29	Thursday	6
November 3	Tuesday	12.30 PM – 1.50 PM - MIDTERM
November 5	Thursday	MIDTERM DISCUSSION
November 10	Tuesday	6
November 12	Thursday	7
November 17	Tuesday	7
November 19	Thursday	8
November 24	Tuesday	8
December 1	Tuesday	9
December 3	Thursday	REVIEW AND QUESTIONS
December 11	Friday	12.30 PM – 2.30 PM - FINAL EXAM

Grades

Homeworks (30%)

Midterm (30%)

Comprehensive final exam (40%)