CE 203 Engineering Geology (SPRING 2024)

Syllabus

Instructor:

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Class:

CE 203 Engineering Geology
Credit Value: (2+2) 3
Course will last 14 weeks,
One day a week and approximately, 4 hours a day.
Every Tuesday, 13:30-17:30 at CE 212 class

Objectives:

1.Give basic information on site investigation techniques and rock material/rock mass characteristics, 2.Integrate student's basic information on site investigation techniques, rock material and rock mass characteristics with previous background to solve engineering geological problems, 3.Educate students to plan, execute and evaluate the results of site investigation techniques applied to a number of engineering geological problems, 4.Educate students to deal with open-ended problems to enhance their thinking and problem solving abilities, 5.Improve student's background through discussing engineering geological case studies and stressing the importance of past mistakes on the safe design of engineering structures

Course Contents:

This course explores the fundamentals of geology applied to civil engineering problems. Topics include rock and mineral types, soil properties, rock mechanics, geologic structures, active tectonics and earthquake hazards, slope stability and landslides, groundwater, dams and tunnel and effect of geological factor on environmental and engineering structure. Team projects include classic engineering geology case studies and site assessment field investigations. Instruction is conducted through lecture and field trips.

1. Introducing Geology
2. Minerals and Rocks
3. Maps, Aerial Photographs and Remote Sensing
4. Weathering
5. Rock Mechanics
6. Soil Mechanics

7. Soil Mechanics and Exam
8. Mass wasting
9. Groundwater
10. Geologic Structures
11. The Essentials of Plate Tectonics, and Other Important Concept
12. Earthquakes
13. Dam
14. Urban Geology
15. Environmental Geology

Learning Outcomes

By the end of the course, students will: analyze problems from different view points apply logic in solving problems use knowledge from various courses in an integrated manner integrate basic knowledge of other engineering disciplines within the scope of the course's project use appropriate engineering tools and methods to solve problems

References:

1. Engineering Geology by Perry H.Rahn
2. Physical Geology by Charles C. Plummer and David McGeary
3. Earth-portrait of a planet by Stephen Marshak
4. Rock Mechanics by John P. Harrison
5. Rock Mechanics by Richard E. Goodman
6. Soil Mechanics by R.F. Craig
7. Mühendislik Jeolojisi- Kemal ErguvanGeochemistry, 2005.
8. Jacques W. Delleur, The Handbook of groundwater engineering, 2nd ed.
9. Morris, P., Therivel, R., Methods of Environmental Impact Assessment (Natural and Built Environment Series), Taylor and Francis Group, 2009.
10. Glasson, J., Therivel, R., Chadwick, A., Introduction to Environmental Impact Assessment (Natural and Buit Environment Series), Taylor and Francis Group, 2009.
11. Baba, A., Tayfur, G., Gunduz, O., Howard, K.W.F., Fridel, M.J., Chambel, A.,Climate Change and its Effects on Water Resources, Issues of National and Global Security, NATO Science Series. Springer. ISBN:978-94-007-1145-7. 2011.
12. Baba, A., Howard, K.W., Gunduz, O., Groundwater and Ecosystems, IV. Earth and Environmental Sciences, NATO Science Series. Springer. ISBN:1-4020-4737-1. 2007.

Grading:

Midterm exam: 30%
Project reports (Presentation + Report): 30%
Final Exam: 40%