CB362 Soil Mechanics

COURSE INFORMATION

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
CB361	3	6	2	2	2	3

COURSE AIM

The course aims at introducing the student to the fundamentals of soil mechanics as a basis for the design, analysis and construction of retaining structures and foundations through using; communication technologies and skills, engineering technologies, data collection and interpretation from laboratory and field, and writing technical reports referring to the relevant literature.

COURSE WEEKLY CONTENTS

1	Seepage: Seepage forces, quick condition, elements of flow net theory Flow nets for two-dimensional flow, determination of seepage quantity from flow nets, seepage through earth dams
2	Seepage: Seepage forces, quick condition, elements of flow net theory Flow nets for two-dimensional flow, determination of seepage quantity from flow nets, seepage through earth dams
3	Effective stress concept Total and effective stresses, seepage force calculation, pressure loading diagrams, calculating the earth pressure forces.
4	Effective stress concept Total and effective stresses, seepage force calculation, pressure loading diagrams, calculating the earth pressure forces.
5	Stresses in soils: distribution of pressure from point load, Boussinesq's equations, uniformly loaded circular area Pressure caused by uniformly loaded rectangular area, pressure caused by embankment load, Newmark's influence chart, approximate estimate
6	Stresses in soils: distribution of pressure from point load, Boussinesq's equations, uniformly loaded circular area Pressure caused by uniformly loaded rectangular area, pressure caused by embankment load, Newmark's influence chart, approximate estimate
7	Consolidation and settlement: Compressibility of soil, one-dimensional consolidation, mechanical analogy model, load-deformation characteristics of soils, one-dimensional consolidation theory + Midterm Exam
8	Consolidation test: Determination of coefficient of consolidation cv, log-time and root-time methods, one-dimensional consolidation test, secondary compression
9	Settlement of soils: Immediate (elastic) settlement, settlement predictions based on one-dimensional consolidation, settlement during construction, total and differential settlements, tolerable settlements in buildings

10	Shear strength of soil: Mohr's theory of failure, determination of the shear strength of cohesion-less and cohesive soils, factors affecting shear strength, in situ evaluation of shear strength
11	Shear strength of soil: Mohr's theory of failure, determination of the shear strength of cohesion-less and cohesive soils, factors affecting shear strength, in situ evaluation of shear strength
12	Stability of slopes: Infinite slopes, the circular arc analysis, ordinary method of slices, Bishop's simplified method, semi-graphical approximation
13	Stability of slopes: Stability charts, Cousin's approach for simple slopes, sliding on inclined plane; liquefaction, seismic effects and drawdown
14	Lateral earth pressure: Active and passive earth pressures, Rankine's theory for level and inclined surfaces, Coulomb's equation
15	Lateral earth pressure: Lateral earth pressure in partially cohesive soils, unsupported cuts in (c-f) soil, effect of surcharge loads, Culmann's method

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	**20 Midterm**	←	10 MARKS To be freely distributed among possible assessments			→	**30**
8 to 12	←		20 MARKS			→	**20**
13 to 15	←		10 MARKS			→	**10**
16 or 17	**40 Final**						**40**
Total	**Exams**	**Assign.**	**Quizzes**	**Reports**	**Present.**	**Lab.**	100

REFERENCES

Textbook	Mechanics of Geotechnical Engineering, Braja M. DAS, Cengage Learning, 8th Edition, 2014. Code of Practice for Foundation and Soil Mechanics, Code No. 203/2007.
Other	Soil Mechanics, CRAIG, R. F., Publisher: Chapman and Hall, 5th Edition 1992. Soil Mechanics, DAS, Braja M. Publisher: Taylor and Francis, Washington, 2nd Ed. 1997.