

GEO206 STRENGTH OF MATERIALS

Term: 2016-17 Spring

Lecturers: Dr. Koray Ulanış (Group A), Dr. Korhan Esat (Group B)

COURSE OUTLINE

Weeks

1-2: INTRODUCTION TO MATERIAL CONCEPT

Definition of "material" in engineering with emphasis on geology. Types and use of geological materials. Units and conversions.

3-4: PRINCIPLES of FORCE, MOMENT and EQUILIBRIUM

Introduction to force, moment and equilibrium. Equilibrium of deformable bodies.

5-6: INTERNAL AND EXTERNAL FORCES

Definition of internal and external forces. Force concept applied to geology.

7: MIDTERM

8-9: PRINCIPLES OF STRESS CONCEPT

Normal, shear and torsion stresses. Stress components. Plane stress problems. Representation of stresses.

10-12: PRINCIPLES OF STRAIN CONCEPT

Deformation and strain, normal and shear strain, Hooke's law, Poisson's Ratio and elastic constants, concept of "Factor of Safety". Elastic and plastic deformation.

13-14: APPLICATION of STRENGTH PROBLEMS to GEOLOGICAL ENGINEERING

Strength problems related to geological materials. Tectonic understanding of stress-strain. Use of strength and strain in engineering geology. Rheology of the lithosphere.

15: FINAL EXAM

GRADING

50% Final Exam

30% Midterm

10% Quizzes

10% Attending class

SUGGESTED REFERENCES

- ✓ Aköz, A.Y, Eratlı, N.,2011. Statik Mukavemet, 2. Baskı. Beta Basım, ISBN: 978-605-377-622-2, 480s. İstanbul.
- ✓ Ersoy, U., Wasti, S.T. and Canbay, E., 2008. Introductory Mechanics of Deformable Bodies. METU Publications, ISBN: 978-9944-0716-0-4. 452p. Ankara
- ✓ Fossen, H., 2016. Structural Geology, Second Edition. Cambridge University Press, 524p.
- ✓ İnan, M., 2015. Cisimlerin Mukavemeti, 9. Baskı, İTÜ Vakfı Yayınları, ISBN: 978-975-7563-05-4, 602 s. İstanbul.
- ✓ Nash, W., Potter, M.C., 2011. Strength of Materials, Fifth Edition. McGraw Hill, ISBN: 978-0-07-163507-3, 201 p.
- ✓ Yayla, P., 2010. Cisimlerin Mukavemeti (Teori ve Çözümlü Problemler), Üçüncü Baskı. Çağlayan Kitabevi, ISBN: 978-975-436-076-9, 406s. İstanbul.