Lecture 13:
Strength models
Strength models for beams (I/II)
1.050 – Content overview

I. Dimensional analysis
   1. On monsters, mice and mushrooms
   2. Similarity relations: Important engineering tools

II. Stresses and strength
   2. Stresses and equilibrium
   3. Strength models (how to design structures, foundations.. against mechanical failure)

III. Deformation and strain
   4. How strain gages work?
   5. How to measure deformation in a 3D structure/material?

IV. Elasticity
   5. Elasticity model – link stresses and deformation
   6. Variational methods in elasticity

V. How things fail – and how to avoid it
   7. Elastic instabilities
   8. Plasticity (permanent deformation)
   9. Fracture mechanics

Lectures 1-3 Sept.
Lectures 4-15 Sept./Oct.
Lectures 16-19 Oct.
Lectures 20-31 Nov.
Lectures 32-37 Dec.
I. Dimensional analysis

II. Stresses and strength

- Lecture 8: Beam stress model
- Lecture 9: Beam model II and summary
- Lecture 10: Strength models: Introduction (1D)
- Lecture 11: Mohr circle – strength criteria 3D
- Lecture 12: Application – soil mechanics: How to build sandcastles
- Lecture 13: Strength criterion in beams (I/II)
- Lecture 14: Strength criterion in beams (II/II) – convexity of strength domain
- Lecture 15: Closure strength models & review for quiz

III. Deformation and strain

IV. Elasticity

V. How things fail – and how to avoid it
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http://members.tripod.com/str_n_tips/eq/eq_rcc2/g23.jpg
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