ARCH 331. Study Guide for Quiz 2

This guide is not providing "answers" for the conceptual questions. It is a list of topical concepts and their application you should be familiar with. It is an *aid* to help prepare for the quiz.

Covers material of Lectures 4, 5, & 6

- ☐ Scale (square-cube) effect
- ☐ Normal stress (compression & tension)
- ☐ Shear stress (non beams)
- ☐ Bearing stress
- ☐ Bending & shear stress (beams)
- ☐ Torsional (shear) stress
- ☐ Relation of strain to stress & Modulus of Elasticity
- ☐ Stiffness (relative to AE/L through δ)
- ☐ Brittle, Ductile & Semi-brittle material behavior
- ☐ Yield strength (or point & proportional limit)
- ☐ Ultimate strength
- ☐ Strength vs. stress
- ☐ Rupture / Fatigue behavior
- ☐ Orthotropic vs. Isotropic vs. Anisotropic materials
- ☐ Creep
- ☐ Stress concentration
- ☐ Thermal vs. elastic strains
- ☐ Geometric constraints
- ☐ Dynamics vs. Statics
- ☐ Serviceability
- ☐ Deformation with stress (deflection & elongation)
- ☐ *Superposition Method*
- ☐ Allowable Stress Design
- ☐ Load and Resistance Factor Design
- ☐ Factored loads
- ☐ Resistance Factors
- ☐ "Design" values vs. "Capacity"
- ☐ Factor of Safety
- ☐ Equilibrium
- ☐ Newton's Third Law
- ☐ Method of Sections
- ☐ Coplanar parallel force systems
- ☐ Free Body Diagram
- ☐ Reactions at a support and relationship to motion prevented
- ☐ Short link or cable, roller, rocker, pin or hinge, smooth surface, rough surface, fixed
- ☐ Negative result for a variable from equilibrium equations from free body diagram
- ☐ "Best" location for summation of moment
- ☐ Statically Determinate vs. Indeterminate
- ☐ Direction and type of force in a cable with relation to geometry
- ☐ Two-force bodies and relationship to loads
- ☐ Three-force bodies
- ☐ Concentrated loads
- ☐ Distributed loads – uniform / non-uniform & hydrostatic
- ☐ Beam support configurations
- ☐ Simply supported
- ☐ Overhang
- ☐ Cantilever
- ☐ Continuous
- ☐ w vs. W
- ☐ Equivalent center of load area
- ☐ Types of beam stresses

- ☐ Prestressing or post tensioning
- ☐ Influence of moment, material, and cross section on deflected shape
- ☐ Internal shear, axial force & bending moment
- ☐ Inflection point
- ☐ The Equilibrium Method
- ☐ The Semigraphical Method
- ☐ Areas under a curve and *change*
- ☐ Effect of forces on shear diagram
- ☐ Effect of moments on moment diagram
- ☐ Location of zero shear (x) and relation to maximum moment
- ☐ How to find location of zero shear
- ☐ Slope relationships with integration
- ☐ Positive vs. negative bending moment "shape"
- ☐ How to use Beam Diagrams and Formula for shear and bending moment