## ARCH 331. Study Guide for Quiz 5

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 18, 19, 20, & 21

- Steel materials, hot-rolled, cold-formed, corrosion, fatigue, strength loss with heat
- □ Steel grades (standard properties)
- □ Yield strength vs. ultimate strength
- □ Local buckling in web & flange
- □ Lateral torsional buckling
- □ Bearing on flange
- □ Plastic section modulus
- □ Plastic moment & plastic hinges
- $\Box$  Braced vs. unbraced length
- □ W (first number meaning) X (second number meaning)
- $\Box$  Area of web
- □ Load tracing & tributary width (vs. area)
- □ Self-weight
- $\Box \quad \text{Neutral axis, section modulus, } Q, \\ \text{extreme fiber}$
- □ Use of Beam Diagrams and Formulas
- $\Box$  Deflections & superpositioning (+ *units*)
- □ Lateral buckling (and bracing)
- □ Design methodologies
- □ Allowable Stress Design
- □ Load and Resistance Factor Design
- □ Unified Design Method
- $\Box$  Factored loads
- □ Resistance Factors
- □ "Design" values vs. "Capacity"
- □ Factor of Safety
- □ Load types (and directions) (*like D, L, S* ...)

- $\hfill\square$  Load combinations
- Minimum Design Loads & Requirements
- □ Serviceability and limits
- $\Box$  Economical selection by Z charts
- □ Design vs. analysis
- □ Use of beam moment capacity charts
- Equivalent distributed load based on a maximum moment
- □ Use of Load Tables
- Horizontal distribution of sloped dead load
- Depth with respect to span length and shape
- □ Joist vs. beam vs. girder
- □ Plate girder
- □ Web stiffener plates
- □ Decking (composite vs. non)
- Open web joist
- □ Method of Sections
- "Best" location for summation of moment
- □ Truss configurations and assumptions for analysis
- □ Zero-force member
- □ Special truss member configurations at joints and conditions
- □ Compound truss, space truss, tensegrity
- Diagonal tension counters and solution method
- □ Lateral bracing and trusses
- □ Compression and trusses

- □ Indeterminate trusses
- □ Slenderness criteria & l/r
- □ with respect to least radius of gyration
- $\Box$  kl/r limit for steel
- □ Compact section criteria
- $\Box$  Use of column load capacity charts
- $\Box$  Check for column design efficiency
- □ Bolt designations
- $\Box$  Gross area
- □ Effective net area
- $\Box$  Area of web
- □ Connection types
- $\Box$  Weld strengths
- □ Throat thickness
- $\Box$  Fillet, butt, plug, slot

- $\Box$  Coping
- $\Box$   $\,$  Tension member, spacing and gage
- $\Box$  Shear lag
- $\Box$  Gusset plates
- $\Box$  Simple shear connector
- $\Box$  Single vs. double shear
- $\Box$  Capacity of a connection
- □ Block Shear Rupture
- □ Effective length, K & bracing
- □ Beam-Columns
- □ Combined bending and compression *interaction*
- $\Box$  P- $\Delta$  effect
- □ Eccentricity