

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 15, 16, 17 & 18

- 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
- Braced vs. unbraced length
- W (first number meaning) x (second number meaning)
- Area of web
- Load tracing & tributary width (vs. area)
- Self-weight
- Neutral axis, section modulus, Q , extreme fiber
- Use of Beam Diagrams and Formulas
- Deflections & superpositioning (+ *units*)
- Lateral buckling (and bracing)
- Design methodologies
- Allowable Stress Design
- Load and Resistance Factor Design
- Unified Design Method
- Factored loads
- Resistance Factors
- “Design” values vs. “Capacity”
- Factor of Safety
- Load types (and directions) (*like D, L, S ...*)
- Load combinations
- Minimum Design Loads & Requirements
- Serviceability and limits
- 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*
- kl/r limit for steel
- Compact section criteria
- Use of column load capacity charts
- Check for column design efficiency
- Bolt designations
- Gross area
- Effective net area
- Area of web
- Connection types
- Weld strengths
- Throat thickness
- Fillet, butt, plug, slot
- Coping
- Tension member, spacing and gage
- Shear lag
- Gusset plates
- Simple shear connector
- Single vs. double shear
- Capacity of a connection
- Block Shear Rupture
- Effective length, K & bracing
- Beam-Columns
- Combined bending and compression – *interaction*
- P- Δ effect
- Eccentricity