

ARCH 331. Study Guide for Quiz 3

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 7, 8, 9 & 10

- Equivalent center of load area
- Equivalent Force Systems
- Composite shape
- Centroid, moment of inertia, Q , radius of gyration
- Negative area method
- Parallel axis theorem
- Bending & shear stress (beams)
- Relation of strain to stress & Modulus of Elasticity
- Neutral axis, section modulus, Q , extreme fiber
- Stiffness (relative to EI/L through Δ)
- Maximum bending stress (& location along length and in cross section)
- Maximum shear stress (& location along length and in cross section)
- Maximum shear stress by beam shape (proper equations)
- Economical selection by A or S charts
- Shear flow and shear center
- Connected area
- Nail capacity and pitch for resisting longitudinal shear
- Statically Determinate vs. Indeterminate
- Restrained
- Continuous
- Inflection point
- Compound beams with pins
- Use of Beam Diagrams and Formulas
- Pinned arches and frames
- Rigid vs. non-rigid pinned frames
- Rigid frame behavior
- Internal pin connections
- Free Body Diagram rule for force at a pin of a frame
- Two-force bodies and relationship to loads
- Three-force bodies
- Moment *redistribution* for statically indeterminate beams
- Connection types and load/moment transfer
- Types and purpose of bracing
- Stability
- Buckling
- Slenderness
- Critical Buckling and Euler’s Formula
- Effective length, K & bracing
- Beam-columns
- Combined bending and compression - *interaction*
- P- Δ effect
- Eccentricity
- Load combinations on rigid frames
- One-way and two-way slab behavior and support types
- Relative joint stiffness for determining effective length (ψ)