FINAL EXAM REVIEW

Topics and Guide

Items in bold are items we think will be emphasized, or items we did not cover much. This does not mean you shouldn’t study other things, but simply seed to spend a little extra time emphasizing the bold items.

1. Pictorial Drawing Types:
   - Perspective
   - Exploded
   - Assembly
   - Isometric
   - Detail Drawing
   - Orthographic
   - Annotated Sketches
   - Freehand
   - Orthographic (Cab v. Cav)
   - Oblique
   - Working
   - Multiview

2. Design Process:
   - 12 steps
   - Brainstorm
   - Models
   - Prototype
   - Design Brief
   - Engineer’s Notebook
   - Portfolio
   - Technical Report
   - Deliverables
   - Constraints
   - Decision Matrix
   - Mock up

3. Parts of a Drawing sheet:
   - Balloons
   - Projected Views
   - Base Views
   - Parts List
   - Auxiliary, Detail Views
   - Title Block & Border
   - Hole Types
   - Sheet
   - Dimensions
   - Hole Notation
   - Hole Notation Techniques
   - Section, Auxiliary, Detail Views
   - Section/Hatch
   - Center Line
   - Cutting Plane
   - Break

4. Line Types:
   - Center
   - Hidden
   - Object
   - Leader
   - Construction
   - Extension
   - Dimension
   - Hole & Thread
   - Arrowheads
   - Center Mark
   - Baseline
   - Chain
   - 45°
   - Section/Hatch
   - Center Line
   - Baseline
   - Extension
   - Chain
   - Arrowheads
   - Center Mark
   - Baseline
   - Chain
   - Leader
   - Object
   - Construction
   - Extension
   - Dimension
   - Hole & Thread
   - Balloons
   - Projected Views
   - Base Views
   - Parts List
   - Auxiliary, Detail Views
   - Title Block & Border
   - Hole Types
   - Sheet
   - Dimensions
   - Hole Notation
   - Hole Notation Techniques
   - Section, Auxiliary, Detail Views
   - Section/Hatch
   - Center Line
   - Cutting Plane
   - Break

5. 2D Inventor Skills:
   - Circle (types)
   - Line
   - Point
   - Offset
   - Spline
   - Fillet
   - Chamfer
   - Rectangle
   - Polygon
   - Mirror
   - Pattern-Trim
   - Ellipse
   - Arc
   - Project Geometry
   - Numeric & Geometric Constraints
   - CAD
   - Circumscribe/Inscribe

6. 3D Inventor Skills:
   - Loft
   - Emboss
   - Hole
   - Extrude
   - Revolve
   - Shell
   - Pattern-Mirror
   - Decal
   - Sweep
   - Rib
   - Coil
   - Work Plane
   - Writing Modeling Steps

7. Basic Inventor Skills:
   - Browser
   - Ribbon
   - Drawing
   - Assembly
   - Part
   - Presentation
   - Degrees of Freedom
   - Dimensioning Guidelines
   - Parametric Modeling
   - Assembly Constraints
   - Tolerances
   - Parametric Modeling
   - Assembly Constraints
   - Adapatively
   - Drive Constraints

8. Mass Properties/Structural Analysis:
   - Mass
   - Density
   - Volume
   - Surface Area
   - Story Problems

9. Visual Design Principles and Elements
   - Elements: Line, Color, Form/Shape, Space, Texture, Value
   - Principles: Balance, Rhythm, Emphasis, Proportion and Scale, Unity (symmetry, asymmetry, etc)
10. **Functional Analysis**
- **black box model**
- mechanism
- **reverse engineering**
  - function
  - observation
  - system
  - hypothesis
  - output
  - input
  - process
  - reverse engineering
  - system

11. **Engineering Ethics**
- **by-product**
- ergonomics
- landfill
- recycle
- **trade-off**
  - carcinogen
  - ethical
  - OSHA
  - refurbish
  - waste
  - ecosystem
  - hazard
  - product lifecycle
  - raw material
  - refuse
  - residue
  - EPA
  - impact
  - product lifecycle
  - raw material
  - residue

12. **Teamwork Topics**
- arbitration
- **gantt chart**
- open-ended
- **virtual team**
  - consensus
  - mediation
  - protocol
  - critique
  - negotiation
  - norms
  - evaluate
  - critique
  - negotiation
  - norms
  - evaluate
  - synergy

13. **Statistics**
- Mean
- Frequency
- Median
- Distribution
- Mode
- **Graphs** (Line, Bar, Circle, Scatter, Histogram...)

14. **Other**
- **Innovation**
- **Invention**
- Marketing
- Packaging
- Bias
- ANSI
- Scale
- Designer
- ASME
- Manufacture
- Product Evolution

Overall

- Project Portfolio
- Engineering Notebook
- Technical Report
- Product Evolution vs. Invention vs. innovation
- Design Brief (Problem statement, Design Statement)
- Decision Matrix
- Table of contents
- Constraints (Geometric [all types], Design, numeric, assembly, dimensions)
- All Line types (Phantom, Construction, Hidden, Section, etc.)
- Orthographic
- Working drawing
- Assembly drawing
- Parts List
- Oblique (Cavalier/Cabinet)
- Isometric (view, drawing)
- Auxiliary view
- Section view
- Perspective (view, drawing)
- Holes (types and dimensioning)
- Dimension (Location, Nominal, Datum, overall, tolerance)
- Data set, Mean, median, mode, range
- Histogram vs. Pie chart vs. Diagram vs. Flow chart
- CAD
- OSHA
- ANSI
- Steps of the Design Process and their role
- Mock-up vs. Prototype vs. Mathematical model vs. scale model
- Reverse Engineering
- Physical Properties (Mass, Surface Area, Volume, Density, Center of gravity)
- Visual Analysis (Elements & Principles)
- Analysis (Finite Element, Mass property, Functional, Structural)
- Gantt Chart
- Engineering Ethics
- Product lifecycle
- Virtual Team
- Group Norms
- Consensus
- Periodic Self-Assessment
- Post Design Survey
- Mediation
- Synergy
- Critique