

Intro to Engineering and Architectural Drafting, Engineering Drafting, Architectural Drafting, and Architectural Models Syllabus

2016-17

Instructor Information

Instructor
Ms. Pontius

Email
pontius@gaylord.k12.mi.us

Office Location & Hours
Room 128 3rd Hour: 9:54 AM-10:56 AM

General Information

Description

Intro: Students will study the fundamental concepts of engineering and architectural drafting through freehand sketching, as well as mechanical drafting and computer aided design. Students will apply these concepts by creating projects which help them understand how Engineers and Architects design products. Some examples of these projects include the design of bridges, simple cars, and vacation homes. Students will also explore the various careers and post high school educational opportunities available to them upon the successful completion of this course. This course meets the on-line learning experience which is required for graduation. *THIS COURSE MEETS THE MICHIGAN STANDARDS FOR A REQUIRED VISUAL, PERFORMING & APPLIED ARTS CREDIT AND THE ON-ONLINE LEARNING EXPERIENCE.*

Engineering: Students will study the advanced concepts of engineering drafting through freehand sketching, as well as mechanical drafting and computer aided design. Students will apply these concepts through two and three dimensional drawings as well as hands on projects which will enhance the students understanding of how engineers solve problems. Post high school educational and career opportunities will also be explored.

Architectural: Students will study the advanced concepts of modern architectural design through two and three dimensional drawings, color rendering, models and computer aided design. Students will apply these concepts by designing their dream home. Post high school educational and career opportunities will also be explored

Architectural Models: Students will study the concepts of how architects construct and use models to convey ideas and market projects. Students will apply these concepts through color site planning, three dimensional landscaping and interior and exterior modeling techniques. The use of digital photography will also be used to create a portfolio of the completed model.

Expectations

Students will be respectful of the teacher, fellow students, the tools and environment in which they work, and of the work they and others create.

Students will report to class on time, and prepared (includes bringing a pencil and any work they may have removed from the room)

Students will not use their phones for texting, pictures, social media, or any other purpose, without permission from the teacher.

Students will use the hall pass sparingly, and if a pass is necessary, students will obtain permission and then sign out/in via the form on teacher desk.

Students will work within the daily goals set through collaboration between the teacher and the student based on the learning objectives.

Goals/Learning Objectives

Students will be expected to meet the State of Michigan Visual, Performing and Applied Arts Standards.

Students will create industry acceptable work based on an assignment specific rubric while utilizing tools of the trade.

Students will learn the terminology and tools related to the fields of CAD, Drafting, and Design.

Students will make connections between CAD, drafting, and design principals, and math and science principals.

Students will learn to measure using standard and metric systems, and conversions of measurements to scaled drawings/renderings.

Students will learn, understand, and utilize the technology components of CAD, Drafting, and Design.

Course Materials

Required Materials

Pencils-Mechanical or Manual. Lead is available on a limited basis for mechanical pencils. Should you forget a pencil; extras will be made available, but must be returned at the end of the hour. All other materials will be provided to students in class.

Required Text

All textual items will be provided in class. Students will not be responsible for taking a text to and from class.

Intro Assessment:

3 Drawings of the same object

1 Isometric

-Graded on:

- Accuracy of measurements
- Accuracy of line usage
- Neatness
- Accuracy of the isometric drawing...are all lines going in the correct direction?

1 Cavalier Oblique

-Graded on:

- Accuracy of measurements
- Accuracy of line usage
- Neatness
- Accuracy of the oblique drawing...are all lines going in the correct direction?

1 Multiview

-Graded on:

- All views present?
- All views in proper place?
- All views spaced correctly?
- All lines present?
- All features represented? Hidden lines/features shown on correct views?

Dimension all three drawings

-Graded on:

- Accuracy of measurements
- Extension lines present?
- Dimension lines present?
- All extension lines and dimension lines proper distance from the drawing?
- Leader lines?
- Proper symbols used?
- All dimensions aligned properly?

Grading:

Isometric: 45 points

Cavalier Oblique: 45 points

Multiview: 50 points

Dimensioning: 45 points total...15 points per drawing

Intro to Architectural and Engineering Drafting Mid-Term Exam

You are to pick a 3-Dimensional Object. Using that object, you must create multiple Drawings.

Multiview Drawing-

- Line Thickness consistent
- Corners meet
- Views in Correct place on paper
- All necessary views present
- Crisp, clear object lines
- All necessary lines present, i.e. center lines, hidden lines
- Views positioned properly-1" over 1" up, 1" in between views
- Measurements Accurate

Isometric Drawing-

- Lines at appropriate angle- 30°
- Line thickness consistent
- Corners meet
- Crisp, clear object lines
- Measurements Accurate

Two-Point Perspective-

- Object drawn to 2 vanishing points
- Projection lines erased/not drawn (only object shows on paper)
- Measurements Accurate
- Line thickness consistent
- Corners Meet
- Crisp, clear object lines

Pattern-

- Cut-lines solid, fold-lines dashed
- Crisp, clear lines
- Corners Meet
- Measurements Accurate
- Line thickness consistent
- Tabs for folding and connecting present
- Pattern is easy to understand and fold
- Pattern makes the 3-D object

3D Object-

- Matches Pattern
- Fits together nicely
- Dimensions match the other drawings

Grading:

- Multiview: 40 points
- Isometric: 25 Points
- Two-Point: 30 points
- Pattern: 40 points
- 3D Object: 25 points
- Overall Appearance: 20 points
- Total: 180 Points

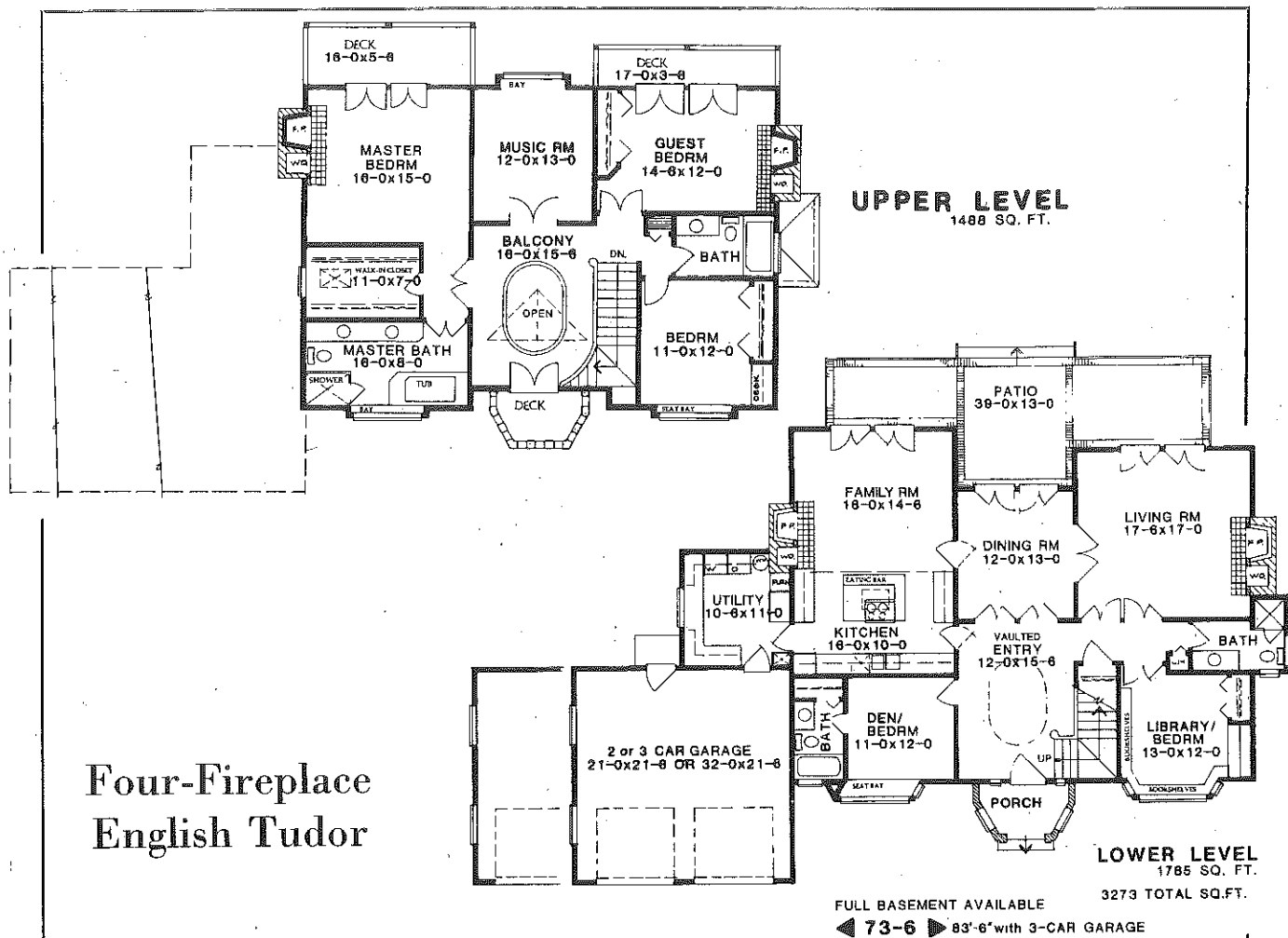
Intro to Architectural and Engineering Drafting Quarterly Exam #2

On a plain sheet of white paper, recreate the attached floor plan.

Use the $1/8'' = 1'$ scale.

Start with a square that is $54' \times 47'-8''$

Worth 100 points



Four-Fireplace English Tudor

PLAN 6607SP—Classical Old English lines highlight the exterior of this family home. Left of the vaulted entry is a den with a connected bath, ideal for use as a guest room or in home office. The spacious kitchen is a busy homemakers dream with plentiful counter space and center cooking island/bar. A utility room, located off the kitchen, features a convenient sewing counter. Carrying out the Old English theme are the two fireplaces which are prominent in both the family and living rooms. The stairway to the right of the entry leads to the upper bedroom level. The three, possible four bedrooms, would make this home perfect for the large family. The master bedroom extends onto the walk-out deck by double French doors. A walk-in closet, and large master bath are also featured in this suite. Four fireplaces, window seats, and spacious rooms calls your attention to the timeless accents of the 3,273 square foot residence.



Intro to Architectural and Engineering Drafting Final Exam

Total Points: 238

Part 1:

For each topic, write and draw everything you know about the topic on a separate sheet of paper.

Alphabet of lines (14 points)

Multiview Drawings (30 points)

Isometric Drawings (20 points)

Oblique Drawings (20 points)

Perspective Drawings (15 points)

Patterns (10 points)

Tools used for drawing (10 points)

Floor Plans (40 points)

Part 2:

Measure the lines on the attached pages using the scale listed on the bottom of the page. (40 points)

Part 3: Answer the following questions:

1. Necessity is the mother of invention. How does this statement relate to engineering and technology? (2 points)
2. What is the strongest shape? Why? How does this shape relate to squares? Or cylinders? (5 points)
3. Define the following terms: substructure, superstructure, roadbed (3 points)
4. Explain how something can be efficient...how to materials, performance, and cost relate to the efficiency of something? How do you know something is efficient? How could a bridge be efficient? (8 points)
5. What is the formula for velocity? (2 points)
6. Define the following terms: aerodynamics, apogee, drag (3 points)
7. Calculate the efficiency of a bridge that weighs 5 grams and holds 35 kg. Efficiency = Load held/bridge mass (4 points)
8. Calculate the potential energy of a rocket with a mass of 56 grams, and a height of 40 meters $PE=m \times g \times h$ (4 points)
9. Calculate the velocity of a rocket that went 50 meters in 60 seconds. (4 points)
10. Using the velocity from question 9, what is the kinetic energy of a rocket that has a mass of 50 grams? $KE= \frac{1}{2} \times m \times v^2$ (4 points)