University of Arkansas – Fort Smith
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General Syllabus

CGT 1234 – Engineering Graphics I

Credit Hours: 4 **Lecture Hours:** 2 **Lab Hours:** 4
Effective Semester: Summer I 2014

I. Course Information

A. Catalog Description

Drawing fundamentals, including orthographic projection, geometric construction, lettering, dimensioning, sectioning, auxiliaries, and sketching. Course combines hand-drafting and an introduction to CAD software.

B. Additional Course Information

An introduction to drawing fundamentals including lettering, use of graphic instruments, graphic geometry, orthographic drawing, auxiliary views, sectional views, dimensioning and pictorial drawing will be covered in this course.

II. Student Learning Outcomes

A. Subject Matter

Upon successful completion of this course, the student will be able to:

1. Prepare basic engineering drawings using manual drafting techniques and drafting instruments.
2. Follow general safety procedures, adjust equipment for maximum comfort and usability, and describe ergonomic considerations.
3. Describe career options, identify educational experience and personal traits that benefit a drafter, and describe potential barriers to career advancement and strategies for removing them.
4. Describe various types of drawings, care for basic drafting equipment and tools, and employ the proper use of drafting tools based on instructor criteria.
5. Given a series of drawing assignments, demonstrate capability in measuring using architects, engineers, and metric scales.
6. Identify standard size, types of drawing media and apply line conventions.
7. Prepare freehand sketches and freehand lettering.
8. Perform metric to U.S. system conversions, apply basic mathematical skill to drawing operations, and apply mathematical calculations involving practical geometry and trigonometry.
9. Demonstrate use of geometric construction methods for drawing bisectors, angles, plane figures, circles and areas.
10. Demonstrate the ability to draw multiple views using the principle of orthographic projections.

11. Draw auxiliary views using orthographic projection and reference plane or folding line methods.
12. Draw section views using orthographic projection and cutting planes.
13. Based on lectures and textbooks, create drawings using the following American National Standards Institute documents:
    a. Line Conventions and Lettering
    b. Multi and Sectional View Drawing
    c. Abbreviations
    d. Dimensions for all types of drawings
    e. Select appropriate types of projections.
14. Demonstrate basic drafting techniques using CAD software.
15. Plan, organize and present a final portfolio.

B. University Learning Outcomes

This course enhances student abilities in the following areas:

Communication Skills

Students will develop skills in communicating using visual graphics. Examples will include geometric construction, multiview construction, section views and auxiliary views.

Technological Skills

Students will use traditional drafting tools to transfer technical principles, ideas and theories to new situations. Students will create examples, apply principles and/or demonstrate an ability or skill in the creation of multiview, section and auxiliary views.

Quantitative Reasoning

Students will be required to apply accurate dimensioning principles to all drawings that are completed. Students will be required to complete the quantitative reasoning required in computing text height, line type scale and dimension scale.

III. Major Course Topics

A. Professional Knowledge

1. Demonstrate ability to prepare basic engineering drawings using manual drafting techniques and drafting instruments.
2. Demonstrate capability in measuring using architects, engineers, and metric scales.
3. Based on lectures and textbooks, create drawings using the following American National Standards Institute documents:
    - Line Conventions and Lettering
    - Multi and Sectional View Drawing
    - Abbreviations
    - Dimensions for all types of drawings
    - Select appropriate types of projections
4. Demonstrate basic drafting techniques using CAD software.

B. Visualization Skills

1. Work with both paper and computer images.
2. Be able to identify industry standard drafting and CAD symbols.

3. Be able to generate necessary views from 2d or 3d representation of objects.
4. Demonstrate use of geometric construction methods for drawing bisectors, angles, plane figure, circles and areas.