Engineering Graphics

One Year (1 Credit)
10th – 12th grades
Prerequisite: Intro to Drafting
Texts:

The student will be familiar with accepted techniques used to illustrate threaded parts, cams, gears, developments and intersections. All drawings will include proper dimensions and tolerances.

The student will construct working drawings using acceptable mechanical drafting techniques. These drawings will include all necessary views including, but not limited to, auxiliaries, sections, pictorials and assembly drawings.

The student will be introduced to a CAD system with the opportunity to solve basic drafting problems on it.

Engineering Graphics

I. Use of tools and equipment pages 15, 18, 21, 22
   A. Diazo machine will be used to produce blue prints
   B. Continue use of drafting tools and equipment
   C. Continue use of precision measuring instruments

II. Sketching and shape description pages 75 - 77 & 79 - 81
   A. Identify and construct various types of sketches
   B. Construct various types of pictorial drawings
   C. Construct various types of presentation drawings

III. Working drawings pages 72 - 74
   A. Identify and select from various layouts
   B. Interpret information from several types of metalworking processes

IV. Hardware and fasteners pages 65 - 66
   A. Identify various types of mechanical fasteners including screws, bolts, keys, pins, and rivets
   B. Identify welding symbols and construct a welding assembly drawing
   C. Draw bolts, screws, and nuts including threads

V. Manufacturing Processes
   A. Identify and construct metalworking processes including: casting, forging, welding, stamping, and sheet metal bending
   B. Identify manufacturing processes including numerical control machinery

VI. Dimensioning and tolerances pages 76, & 78 - 81

A. Demonstrate understanding of the basic concepts of tolerancing
B. Calculate and dimension various types of fits using fit tables
C. Demonstrate a basic understanding of terminology with surface finishing
D. Use tolerance dimension in a drawing

VII. Development and intersections pages 82, 83, 85 & 86

A. Construct drawings of intersections and developments
B. Identify industrial applications for intersections and development
C. Demonstrate an understanding of the terms: projection planes, reference lines, points in space, true length of a line, auxiliary planes, point of view of a line, plane in space, true shape of a plane
D. Construct various types of developments
E. Construct length of lines and true size planes using auxiliary views

VIII. Power Transmission page 69 and Engineering Design Graphics page 347 problem 1

A. Identify various types of gears and construct a drawing of several types of gears
B. Calculate a gear ratio and speeds
C. Identify common types of cams and followers and their motion
D. With necessary information construct a drawing of a car and follower
E. Identify types of bearings and select the proper one for the application

IX. Computer-aided drafting

A. Demonstrate a basic knowledge of the computer and the software
B. Construct a set of drawings including an isometric drawing and plot them
C. Store information on external storage device