Computer Aided Drawing and Design 4
5 credit Honors Course
Revised 2008
Course Outline

Course Description:
Computer Aided Drawing and Design 4 seeks to expand student's ability to communicate through a formal system of symbols (technical drawing), as well as to expand technical skills as they relate to the subject area.

High Point Regional High School's curriculum and instruction are aligned to the State's Core Curriculum Content Standards and address the elimination of discrimination by narrowing the achievement gap, by providing equity in educational programs and by providing opportunities for students to interact positively with others regardless of race, creed, color, national origin, ancestry, age, marital status, affectional or sexual orientation, gender, religion, disability or socioeconomic status.

Prerequisites:
Computer Aided Drafting and Design 4 is an Honors level capstone class, and the first 3 levels of CADD are prerequisites.

Method of Instruction:
The curriculum is addressed through a series of teacher guided lessons and demonstrations. The instructor will seek to engage students in drawing assignments meant to reinforce concepts critical to efficiency in technical drawing communication.

Content Standards:
Engineering Design Technology 1 covers Standards:

- 8.1.A Computer and Information Literacy – Basic Computer Tools and Skills
- 8.1.B Computer and Information Literacy – Application and Productivity Tools
- 8.2.A Technology Education – Nature and Impact of Technology
- 8.2.B Technology Education – Design Process and Impact Assessment
- 8.2.C Technology Education – Systems in the Designed World

General Objectives:
At the conclusion of this curriculum, students will be able to:

- Prepare technical drawings in accordance to formal technical drawing rules
- Communicate through the use of manually generated two dimensional and three-dimensional representations.
- Communicate through the use of computer generated two and three-dimensional drawings.
- Define and utilize a variety of drawing styles.
- Simplify drawing technique through hand drawing and computer aided drawing.

Course Outlline:

Unit 1- CADD Review & Expectations- Time- 5 days

- For students to realize the role and importance of drawing skills to a variety of careers.
- Define the terms: graphic communication, spoken language, writing, technical graphics, and technical drawing.
- Identify occupations that require the ability to read and understand graphic information such as drawings, charts, and diagrams.
- Evaluate the importance of technical graphics to a real world problem.
- Explain the importance of spatial cognition to people in today's world.
- Classify drawings and models into similar categories.

Unit 2- Technical Sketching- Time 20 days

- For students to gain skills necessary to become proficient in sketching and design based work.
- Identify the tools, paper, and drawing styles common to drafting.
- Imitate lettering exercises according to recommended practices.
- Demonstrate proper sketching techniques
- Identify and construct the basic linetypes
- Combine drafting tools to draw incrementally angled lines.

Unit 3- Orthographic Projection-Time 30 days

- For students to develop their ability to accurately read and manually construct orthographic and isometric drawings.
- Define Orthographic Projection.
- Examine an Isometric drawing in order to complete a three view Orthographic Projection.
- Define dimension terminology.
- Summarize the role of title blocks to the related drafting fields.
- Demonstrate an understanding of the ANSI dimension rules.
- Define ANSI and ASME.
- Construct orthographic projection assignments.
- Demonstrate good drafting techniques.

Unit 4- 3-D modeling - Time 30 days

- For students to develop skills necessary to drafting communication through the use of a Computer Aided Design system.
- Utilize 4 coordinate input formats: relative, polar, absolute and mouse.
- Define the term workspace.
- Illustrate dimensioning techniques.
- Utilize 3-D modeling techniques to effectively communicate technical drawing information.
- Simplify toolbars to fit a user's unique needs.
- Imitate the method of creating and recalling a block.
- Construct an orthographic drawing.

Unit 5- Orthographic Generation from 3-D Modeling - Time 25 days

- For students to develop skills necessary to efficiently construct orthographic Drawings from 3-D computer models.
- Demonstrate an understanding of classifying drafting principals as they relate to orthographic drawing
- Utilize drafting tools and knowledge to complete Orthographic construction
- Utilize an array of CAD commands
- Utilize CAD systems to create a orthographic construction.
- Evaluate the efficiency of a Computer Aided Design system.
- Identify linestyles of the ANSI Alphabet of Lines.
- Utilize CAD layers (linestyles) to represent ANSI linetypes.

Unit 6- Sectional Drawings-Time 20 days

- For students to develop efficiency and understanding of sectional drawings.
- Identify the different types of Sectional Drawings: full section, half section and offset section.
- Examine the efficiency of the sectional drawing style for graphic representation and design.
- Examine the cutting plane of an isometric drawing to construct a full section view.
- Utilize the hatch command in a CAD system for full section construction.

Unit 7- 3-D Prototyping- Time 20 days

- For students to generate 3-D physical models of their computer generated 3-D models.
- Utilize proper drawing techniques to generate a 3-D model and prototype that model using rapid prototyping techniques.
- Generate typed descriptions of the solutions that are within the design requirements.
- Describe fields and careers related to 3-D prototyping, and how these concepts relate to engineering and other fields.

Unit 8- Animation- Time 25 days

- For students to generate and animate a three-dimensional object using a CAD and animation program.
- Utilize CAD software to generate a three-dimensional object of their product.
- Utilize Animation software to animate the three-dimensional object.

Assessment:

The assessment of student progress in the objectives cited on the previous pages will be primarily by, but not limited to, the following criteria:

- Drawings 40%
- Class Participation 40%
- Tests/quizzes 20%