Wolcott Public Schools

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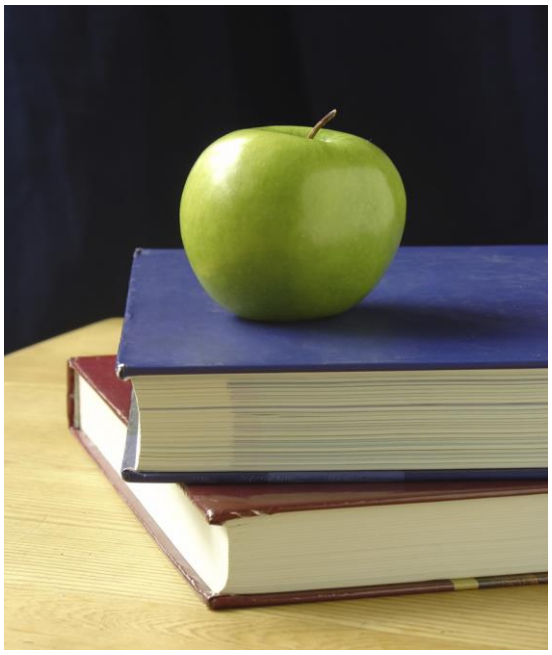
High School Curriculum
Career and Technology Education
Grade 9 to 12



Children are our Future…

Acknowledgements

Curriculum Writers:

John Matthews

We acknowledge and celebrate the professionalism, expertise, and diverse perspectives of these teachers. Their contributions to this curriculum enrich the educational experiences of all Wolcott students.

Mr. Frank Purcaro
Director of Curriculum and Professional Development

Date of Presentation to the Board of Education: Sept. 10, 2015

Computer Assisted Drafting and Design

Computer Assisted Drafting and Design

Mission Statement:
The mission of the Wolcott Public Schools is to promote the academic, social, and emotional development of all students to become contributing members of the global community.

Departmental Philosophy:

Design is the basic element in all STEM disciplines. It is found in science in creating investigations that help students understand their physical world; in technology students find design in the creation of tools and materials to make their world easier to manage; engineering is all about the design process. New ideas are designed, tested, changed and designed again based on the results of testing; mathematics uses design to solve complex and challenging problems. It is engineering that the design concepts are mastered and applied to real world solution. Design (through engineering) is the method to solve practically any problem and is how students will learn to change their environment to meet their own and the community's needs and desires.

STEM will provide students with the knowledge and practice necessary to transfer acquired skills in new and unfamiliar situations. With a rapidly changing world, students will be required to take what they already know and achieve and apply it in situations that cannot be imagined today. Change is the one constant throughout a student's life, learning to adapt and command change cannot be left for chance but must be taught and practiced.

Course Description:

CADD / TECHNICAL DRAFTING
Grades 9-12, 1 Unit

This challenging course is designed for students with a strong math and technical background who are interested in interior design, any field of engineering, architecture, and drafting or design. Students learn basic drafting skills then prepare drawings in the CADD lab using the latest software including Solid Works, AutoCad, and various Architecture programs. Hands on engineering models will also be produced.

Computer Assisted Drafting and Design

Content Standard: **(CT-CAD) A.** Identify and describe the basic elements used in computer aided drafting and design
E. Creating and Manipulating Mechanical Drawing Information: Describe and demonstrate the process for creating various types of views using a well-organized process
(ITEEA) Std. 17. Students will develop an understanding of and be able to select and use information and communication technologies

Performance Standards	*Sample Activities*	*Assessment Strategies*	*Resources*
B-12. Identify and describe the purpose of program components.	**How do you use the program?** - Lesson/Demonstration on how to navigate the Menu's and tool bars - Students will follow along on their computers	N/A	• Computers with AutoCAD 2015 • AutoCAD 2015 Tutorial – Frist Level: 2D Fundamentals Intro 2-14

Computer Assisted Drafting and Design

Content Standard: **(CT-CAD) C.** Describe the process of utilizing various hardware and operating systems
E. Creating and Manipulating Mechanical Drawing Information: Describe and demonstrate the process for creating various types of views using a well-organized process
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Performance Standards	*Sample Activities*	*Assessment Strategies*	*Resources*
C-14. View file names on a storage device. **C-15**. Store, copy, move, and retrieve information to/from various drives. **C-16.** Rename and backup files. **E-21**. Describe the process for setting and editing drawing elements. **E-22**. Create and edit line types, colors and layers/levels. **E-23**. Create and edit basic geometry.	**How do you use the program?** • Students will begin to learn the basic drawing commands to complete a simple freehand sketch	• Visual check	- Computers with AutoCAD 2015 AutoCAD 2015 Tutorial - First Level: 2D Fundamentals. Chapter 1

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Performance Standards	*Sample Activities*	*Assessment Strategies*	*Resources*
A 9. Identify the following basic geometric elements: line, circle, rectangle, sphere and cube. **E 20**. Explain the Cartesian coordinate system. **E-23**. Create and edit basic geometry.	**How can the Cartesian coordinate system be applied to a CAD drawing?** • Students will complete the Guide Plate drawing • Students will complete the Spacer drawing	• Drawing rubric • Answer review questions	- Computers with AutoCAD 2015 AutoCAD 2015 Tutorial - First Level: 2D Fundamentals. Chapter 2

Computer Assisted Drafting and Design

Content Standard: **(CT-CAD) A.** Identify and describe the basic elements used in computer aided drafting and design. **D. Interpreting and Reading Blueprints. E. Creating and Manipulating Mechanical Drawing Information:** Describe and demonstrate the process for creating various types of views using a well-organized process
(ITEEA) Std. 17. Students will develop an understanding of and be able to select and use information and communication technologies

Performance Standards	*Sample Activities*	*Assessment Strategies*	*Resources*
A-1. Describe objects as geometric entities. **A-3**. Describe and demonstrate the of graphic communication skills through sketching. **D-17**. Interpret basic views and dimensions in a working drawing. **D-19**. Interpret drawings, pictures, and symbols. **E-23.** Create and edit basic geometry.	**How do you construct a basic object?** • Students will utilize the Dynamic Input Functions • Students will complete the Rocker Arm drawing • Students will complete the review questions • Students will complete two additional drawings	• Drawing rubric • Answer review questions	- Computers with AutoCAD 2015 AutoCAD 2015 Tutorial - First Level: 2D Fundamentals. Chapter 2

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Performance Standards	*Sample Activities*	*Assessment Strategies*	*Resources*
A-1. Describe objects as geometric entities. **E-23**. Create and edit basic geometry.	**Geometric construction and editing tools.** Students will: - set up the display of drawing units - display toolbars - set up and use Object Snaps - Edit using Extend and Trim - use the Fillet command - Create parallel geometric entities - use the PEDIT command - use the Explode command Students will complete 2 exercises and one drawing.	• Drawing rubric • Answer review questions	- Computers with AutoCAD 2015 AutoCAD 2015 Tutorial - First Level: 2D Fundamentals. Chapter 3

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Performance Standards	*Sample Activities*	*Assessment Strategies*	*Resources*
E-21. Describe the process for setting and editing drawing elements. **E-22**. Create and edit line types, colors and layers/levels.	**What are layers used for?** Students will: - Create new layers - Control layer visibility - Move objects to different layers	• Answer review questions	- Computers with AutoCAD 2015 AutoCAD 2015 Tutorial - First Level: 2D Fundamentals. Chapter 4

Computer Assisted Drafting and Design

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Performance Standards	*Sample Activities*	*Assessment Strategies*	*Resources*
E - 25. Create orthographic, isometric, section and auxiliary views. **E – 27**. Generate a 2-D multiview drawing. **G - 34**. Create a 2-D drawing from a 3-D model.	**How do you make a shop drawing/blue print?** Students will: - Create 2D orthographic views - Use the Construction Line command - Use Running Object Snaps - Use projection lines between orthographic views - Use the Polar Tracking option Complete four orthographic drawings.	• Drawing rubric • Answer review questions	- Computers with AutoCAD 2015 AutoCAD 2015 Tutorial - First Level: 2D Fundamentals. Chapter 5

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Performance Standards	*Sample Activities*	*Assessment Strategies*	*Resources*
A-7. Evaluate the choice and placement of dimensions, notes, and annotations to clearly communicate design intent. **D-17.** Interpret basic views and dimensions in a working drawing. **E-24**. Place and edit text and fonts. **E-26**. Place and edit dimensions.	**How do you specify the sizes of different things?** Students will: - Understand dimensioning nomenclature and basics - Display and use the dimension toolbar - Create center marks - Add linear and angular dimensions - Use the Text command - Create special characters in notes Students will complete 4 orthographic drawings including all dimensions	• Drawing rubric • Answer review questions	- Computers with AutoCAD 2015 AutoCAD 2015 Tutorial - Frist Level: 2D Fundamentals. Chapter 6

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Performance Standards	*Sample Activities*	*Assessment Strategies*	*Resources*
A-7. Evaluate the choice and placement of dimensions, notes, and annotations to clearly communicate design intent. **E-22**. Create and edit line types, colors and layers/levels. **E-25.** Create orthographic, isometric, section and auxiliary views.	**How do you draw the inside of an object?** Students will: - Use CAD methods to create section views - Use the object snap shortcut options - Change the linetype scale property - Stretch and move objects with Grips - Create Cutting Plane lines - Use the Hatch command Complete two section drawings including dimensions.	• Drawing rubric • Answer review questions	- Computers with AutoCAD 2015 AutoCAD 2015 Tutorial - First Level: 2D Fundamentals. Chapter 10

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Performance Standards	*Sample Activities*	*Assessment Strategies*	*Resources*
A-4. Send and access information through a network. **A-6**. Export and import images/files in a variety of file formats. **A-8**. Revise a design and update finished drawings appropriately. **C-15**. Store, copy, move, and retrieve information to/from various drives.	**How do you draw something which has multiple parts?** Students will: - Create an Assembly Drawing from part files - Load multiple drawings into a single AutoCAD session - Define a block - Create multiple copies using blocks - Copy and paste with the Windows clipboard - Use the Move and Rotate commands Create a set of detail and assembly drawings.	• Drawing rubric • Answer review questions	- Computers with AutoCAD 2015 AutoCAD 2015 Tutorial - First Level: 2D Fundamentals. Chapter - 11

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Performance Standards	*Sample Activities*	*Assessment Strategies*	*Resources*
A-2. Describe and demonstrate the process of using a mechanical or electronic caliper accurately as required by the design intent. **A-5.** Express a design of an object as a 3D model. **A-10.** Describe and apply the following basic geometric concepts to building 3D models: tangent and parallel concentric. **E-28.** Generate a pictorial drawing. **F-31.** Create an assembly in 3D geometry. **F-32**. Create an exploded view of a 3D assembly. **G-33.** Create and edit construction planes through reference geometry. **G-34.** Create a 2D drawing from a 3D model. **G-35**. Create a 3D model from a 2D drawing.	**How are 3D "virtual" objects drawn?** Students will complete the following Solid Works assignments:: - Introduction to Solid Works - Lessons 1-3 Parts, Assemblies and Drawings - Multi-Body Parts - Fillets - Pattern Features - Revolve and Sweep Features - Surfaces - Lofts - Sheet Metal - 3D Sketching - Advanced Designs Final project: Complete a reversed engineered virtual assembly of an object with at least 8 or more component parts	• Drawing rubric	- Computers with Solid Works

Computer Assisted Drafting and Design

CADD/Drafting

Pacing Guide

September: **Lettering**
Line Conventions
Measurement
Geometric constructions
Sketching
Orthographic projections

October: **Orthographic projections**
Section Drawings
Auxiliary Drawings
Isometric Drawings

November: **Perspective Drawings**
Pattern Developments
Introduction to AutoCad
Basic Object Construction and Dynamic Input

December: **Geometric Constructions**
Using Layers
Orthographic and Multiview Drawings

January: **Dimensioning with AutoCad**
Section Views with AutoCad
Assembly Drawings with AutoCad

February: **Introduction to Solid Works**
3D CAD Tutorials with Solid Works
Lessons 1-3 Parts, Assemblies and Drawings
Multi-Body Parts

March: **Fillets**
Pattern Features
Revolve and Sweep Features

April: **Surfaces**
Lofts
Sheet Metal

May: **3D Sketching**
Advanced Designs
Solid Works Final Project

June: **Solid Works Final Project**

Computer Assisted Drafting and Design

Essential Questions

1. How do you use the program?

2. How can the Cartesian coordinate system be applied to a CAD drawing?

3. How do you construct a basic object?

4. What are layers used for?

5. How do you make a shop drawing/blue print?

6. How do you specify the sizes of different things?

7. How do you draw the inside of an object?

8. How do you draw something which has multiple parts?

9. How are 3D “virtual” objects drawn?

Computer Assisted Drafting and Design

Skills Objectives
Assessments

[That are aligned to the curriculum – this will be done through the data teams throughout the year – no need to do them now, I just wanted to let you know where they will go in the curriculum, as we complete them. Thanks.]