

**Winslow Township School District**  
**10-12 CAD I**  
**Unit 2: Advanced Commands & System Variables**

**Overview:** In this unit, students will utilize advanced AutoCAD commands.

Overview	Standards	Unit Focus	Essential Questions
<p><a href="#"><u>Unit 2</u></a></p> <p><b>Advanced Commands &amp; System Variables</b></p>	<ul style="list-style-type: none"> <li>• <b>8.1.12.CS.2</b></li> <li>• <b>8.1.12.CS.3</b></li> <li>• <b>8.1.12.DA.2</b></li> <li>• <b>8.2.12.ED.2</b></li> <li>• <b>8.2.12.ITH.3</b></li> <li>• <b>8.2.12.NT.2</b></li> <li>• <b>9.3.12.AC.1</b></li> <li>• <b>9.3.12.AC-DES.6</b></li> </ul>	<ul style="list-style-type: none"> <li>• Compare and contrast methods of selecting objects.</li> <li>• Demonstrate an understanding of importing raster drawings into AutoCAD's vector environment.</li> <li>• Increase student work rate through the use of more advanced and efficient commands.</li> <li>• Students will identify and explore system variable commands.</li> </ul>	<ul style="list-style-type: none"> <li>• What is the difference between a blue selection window and a green crossing window?</li> <li>• What can be done to minimize the process of selecting objects?</li> <li>• How does the manufacturer alert the user to any new or improved commands?</li> <li>• What advanced methods of editing objects are used on larger scale projects?</li> <li>• What are system variables?</li> </ul>
<p><i>Unit 2: Enduring Understandings</i></p>	<ul style="list-style-type: none"> <li>• The blue selection window only includes objects contained within that window. The green crossing window includes objects in and crossing through that window.</li> <li>• When selecting multiple objects use a crossing window or drag the mouse to draw a freeform window. Keyboard shortcuts such as fence, previous, remove, etc. streamline the process.</li> <li>• Autodesk updates the software yearly in addition to frequent mini updates. Any new tools are highlighted and videos are distributed to licensed end users. This information is then stored in the Help menu.</li> <li>• Advanced methods, such as adding attributes to blocks, not only assigns data to object, but allows the end user to store this information and create reports..</li> <li>• System variables are special settings commands. They can only be answered with the binary answers 1 or 0. They mainly effect the way information is displayed on screen.</li> </ul>		

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Curriculum Unit 2	Standards		Pacing	
			Days	Unit Days
<b>Unit 2: Advanced Commands &amp; System Variables</b>	<b>8.1.12.CS.2</b>	Model interactions between application software, system software, and hardware.	2	27
	<b>8.1.12.CS.3</b>	Compare the functions of application software, system software, and hardware.	1	
	<b>8.1.12.DA.2</b>	Describe the trade-offs in how and where data is organized and stored.	2	
	<b>8.2.12.ED.2</b>	Create scaled engineering drawings for a new product or system and make modification to increase optimization based on feedback.	6	
	<b>8.2.12.ITH.3</b>	Analyze the impact that globalization, social media, and access to open source technologies has had on innovation and on a society's economy, politics, and culture.	2	
	<b>8.2.12.NT.2</b>	Redesign an existing product to improve form or function.	4	
	<b>9.3.12.AC.1</b>	Use vocabulary, symbols and formulas common to architecture and construction.	4	
	<b>9.3.12.AC-DES.6</b>	Apply the techniques and skills of modern drafting, design, engineering and construction to projects.	4	
	Assessment, Re-teach and Extension			

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**Unit 2 Grade 10-12**

Enduring Understanding	Indicator #	Performance Expectation
A computing system involves interaction among the user, hardware, application software, and system software.	<b>8.1.12.CS.2</b>	Model interactions between application software, system software, and hardware.
A computing system involves interaction among the user, hardware, application software, and system software.	<b>8.1.12.CS.3</b>	Compare the functions of application software, system software, and hardware.
Choices individuals make about how and where data is organized and stored affects cost, speed, reliability, accessibility, privacy, and integrity.	<b>8.1.12.DA.2</b>	Describe the trade-offs in how and where data is organized and stored.
Engineering design is a complex process in which creativity, content knowledge, research, and analysis are used to address local and global problems.	<b>8.2.12.ED.2</b>	Create scaled engineering drawings for a new product or system and make modification to increase optimization based on feedback.

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<p>Changes caused by the introduction and use of a new technology can range from gradual to rapid and from subtle to obvious, and can change over time. These changes may vary from society to society as a result of differences in a society's economy, politics, and culture.</p>	<p><b>8.2.12.ITH.3</b></p>	<p>Analyze the impact that globalization, social media, and access to open source technologies has had on innovation and on a society's economy, politics, and culture.</p>
<p>Technology, product, or system redesign can be more difficult than the original design.</p>	<p><b>8.2.12.NT.2</b></p>	<p>Redesign an existing product to improve form or function.</p>
	<p><b>9.3.12.AC.1</b></p>	<p>Use vocabulary, symbols and formulas common to architecture and construction.</p>
	<p><b>9.3.12.AC-DES.6</b></p>	<p>Apply the techniques and skills of modern drafting, design, engineering and construction to projects.</p>

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**Assessment Plan**

**Teacher Created Formative Assessments**

- Terminology Quizzes.
- Design Projects.
- Tutorial exercises and packets
- Pre-planning bubble diagrams

**Teacher Created Summative Assessments**

- End of Unit Exams.
- Mid-term Exams.
- Final Exams
- Portfolio Review

Alternative Assessments:

- Group Critiques of student work consisting of round robin style class discussions.
- Conduct short research projects on construction documentation as well as master architects/engineers including analysis and reflection.
- Observe online master videos and teacher created power points of CAD methods and techniques followed by round robin style group discussion.
- Flash card “buzz” word review presented in a game show style.

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Resources	Activities
<p><b>Textbooks:</b></p> <p>Kicklighter &amp; Thomas, <i>Architecture: Residential Drafting &amp; Design</i>, Goodheart- Wilcox, 12th edition.</p> <p>French &amp; Hesel, <i>Mechanical Drawing: Board and CAD Techniques, Student Edition</i>, McGraw-Hill Education, 13th edition.</p> <p>Brower, <i>Architectural Drafting Assignments Using AutoCAD</i>, Cengage Learning, 1st Edition.</p> <p>Ramsey/Sleeper, American Institute of Architects, <i>Architectural Graphic Standards</i>, Wiley; 12th student edition</p> <p>Finkelstein, <i>AutoCAD Bible</i>, Wiley; 2005</p> <p><b>Digital Imaging Software:</b></p> <ul style="list-style-type: none"> <li>○ <a href="#">AutoDesk: AutoCAD</a></li> </ul> <p><b>Other Software:</b></p> <ul style="list-style-type: none"> <li>• <a href="#">G Suite (Classroom, Slides, Docs, Sheets)</a></li> <li>• <a href="#">Microsoft Office (Word, Power Point)</a></li> <li>• <a href="#">Internet Browsers (Chrome, Safari)</a></li> <li>• <a href="#">PC Browsers (Finder, Explorer)</a></li> </ul> <ul style="list-style-type: none"> <li>• Diversity, Equity &amp; Inclusion Educational Resources  <a href="https://www.nj.gov/education/standards/dei/">https://www.nj.gov/education/standards/dei/</a></li> </ul>	<ul style="list-style-type: none"> <li>• Teacher will demonstrate and introduce the differences between the MAC and the Windows platform.</li> <li>• Teacher will routinely review any new updated commands or drawing methods and students will follow suit and practice using their machines.</li> <li>• Students will research and report back to class on their assigned tools. On the Smartboard, they will be demonstrating through examples, the use of these tools including any updates along with further expansion of existing tools through explanations of all options.</li> <li>• Students will create and maintain a "Command Notebook" listing new commands used in each project. It lists the command, its function and how to access it through the user interface.</li> <li>• Students will draw multiple objects to various scales</li> <li>• Students will determine which scales to use as opposed to having the instructor dictate.</li> <li>• Students are to complete tutorial “packets” demonstrating advanced software tools and functions.</li> <li>• Students will calculate building materials needed for a storage shed.</li> <li>• Students will electronically draw an isometric view of the storage shed to scale.</li> <li>• Students will electronically draw multiple sets of doors to be used throughout the school year using two different scales.</li> <li>• Students will electronically design and draw a plan and elevation view of a tiki hut.</li> <li>• Students will draw side views of a wrench and a nameplate which forces them to fit their drawing into an established footprint as well as determine and draw radii for circles and arcs.</li> </ul>

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Instructional Best Practices and Exemplars	
1. Identifying similarities and differences 2. Summarizing and note taking 3. Reinforcing effort and providing recognition 4. Homework and practice 5. Nonlinguistic representations	6. Cooperative learning 7. Setting objectives and providing feedback 8. Generating and testing hypotheses 9. Cues, questions, and advance organizers 10. Manage response rates
9.1 Personal Financial Literacy, 9.2 Career Awareness, Exploration, Preparation and Training, 9.3 21 <sup>st</sup> Century Life and Careers & 9.4 Life Literacies and Key Skills	
<p><b>9.2.12.CAP.3</b> Investigate how continuing education contributes to one's career and personal growth.</p> <p><b>9.2.12.CAP.4</b> Evaluate different careers and develop various plans (e.g., costs of public, private, training schools) and timetables for achieving them, including educational/training requirements, costs, loans, and debt repayment.</p> <p><b>9.2.12.CAP.5</b> Assess and modify a personal plan to support current interests and postsecondary plans.</p> <p><b>9.2.12.CAP.6</b> Identify transferable skills in career choices and design alternative career plans based on those skills</p> <p><b>9.2.12.CAP.10</b> Identify strategies for reducing overall costs of postsecondary education (e.g., tuition assistance, loans, grants, scholarships, and student loans).</p> <p><b>9.3.12.AR.6</b> Evaluate technological advancements and tools that are essential to occupations within the Arts, A/V Technology &amp; Communications Career Cluster.</p> <p><b>9.3.12.AR-VIS.1</b> Describe the history and evolution of the visual arts and its role in and impact on society.</p> <p><b>9.3.12.AC.1</b> Use vocabulary, symbols and formulas common to architecture and construction</p> <p><b>9.3.12.AC-DES.6</b> Apply the techniques and skills of modern drafting, design, engineering and construction to projects.</p> <p><b>9.4.12.CI.1</b> Demonstrate the ability to reflect, analyze, and use creative skills and ideas (e.g., 1.1.12prof.CR3a).</p> <p><b>9.4.12.CT.1</b> Identify problem-solving strategies used in the development of an innovative product or practice (e.g., 1.1.12acc.C1b, 2.2.12.PF.3).</p> <p><b>9.4.12.CT.2</b> Explain the potential benefits of collaborating to enhance critical thinking and problem solving (e.g., 1.3E.12profCR3.a).</p>	

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**9.4.12.DC.1**

Explain the beneficial and harmful effects that intellectual property laws can have on the creation and sharing of content (e.g., 6.1.12.CivicsPR.16.a).

**9.4.12.DC.4**

Explain the privacy concerns related to the collection of data (e.g., cookies) and generation of data through automated processes that may not be evident to users (e.g., 8.1.12.NI.3).

**9.4.12.IML.1**

Compare search browsers and recognize features that allow for filtering of information.

**9.4.12.TL.1**

Assess digital tools based on features such as accessibility options, capacities, and utility for accomplishing a specified task (e.g., W.11-12.6.).

The implementation of the 21st Century skills and standards for students of the Winslow Township District is infused in an interdisciplinary format in a variety of curriculum areas that include, English language Arts, Mathematics, School Guidance, Social Studies, Technology, Visual and Performing Arts, Science, Physical Education and Health, and World Language.

Additional opportunities to address 9.1, 9.2 & 9.4:

**Philadelphia Mint**

<https://www.usmint.gov/learn/kids/resources/educational-standards>

**Different ways to teach Financial Literacy.**

<https://www.makeuseof.com/tag/10-interactive-financial-websites-teach-kids-money-management-skills/>



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**Modifications for Special Education/504**

*Students with special needs:* The students' needs will be addressed on an individual and grade level using a variety of modalities.

Accommodations will be made for those students who need extra time to complete assignment. Support staff will be available to aid students related to IEP specifications. 504 accommodations will also be attended to by all instructional leaders. Physical expectations and modifications, alternative assessments, and scaffolding strategies will be used to support this learning. The use of Universal Design for Learning (UDL) will be considered for all students as teaching strategies are considered.

- Small group instruction and demonstration
- Electronic, printed and verbal instruction
- One-on-one demonstration
- Leveled informational texts and videos via online
- Modeling and guided practice
- Read directions aloud
- Repeat, rephrase and clarify directions
- Extended time as needed
- Break down assignments into smaller units
- Provide shortened assignments
- Modify testing format
- Preferential seating
- Graphic organizers
- Study guides, study aids and re-teaching as needed

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**Modifications for At-Risk Students**

Formative and summative data will be used to monitor student success. At first signs of failure, student work will be reviewed to determine support. This may include parent consultation, basic skills review and differentiation strategies. With considerations to UDL, time may be a factor in overcoming developmental considerations. More time will be made available with a certified instructor to aid students in reaching the standards.

- Contact parents, guidance & child study if students are in danger of failing.
- Provide an assignment sheet with step-by-step instructions as well as specifications for each project.
- Provide design templates.
- Provide study guides.
- Provide extended time for written assessments.
- Extended time as needed
- Read directions aloud
- Assist with organization
- Use of computer to create, edit and store student work.
- Emphasize/highlight key concepts
- Recognize success
- Provide timelines for work completion
- Break down multi-step tasks into smaller chunks
- Provide copy of class notes and graphic organizer

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English Language Learners	Modifications for Gifted Students
<p>All WIDA Can Do Descriptors can be found at this link:  <a href="https://wida.wisc.edu/teach/can-do/descriptors">https://wida.wisc.edu/teach/can-do/descriptors</a></p> <p><input type="checkbox"/> Grades 9-12 WIDA Can Do Descriptors:</p> <p style="padding-left: 20px;"><input type="checkbox"/> Listening <input type="checkbox"/> Speaking <input type="checkbox"/> Reading  <input type="checkbox"/> Writing <input type="checkbox"/> Oral Language</p> <p>Students will be provided with accommodations and modifications that may include:</p> <ul style="list-style-type: none"> <li>• Relate to and identify commonalities in Architectural &amp; Engineering studies in student’s home country</li> <li>• Use sentence/paragraph frames to assist with writing reports.</li> <li>• Work with a partner to develop and understand written and design projects</li> <li>• Provide extended time for written responses.</li> <li>• Assist with organization</li> <li>• Use of computer for quick translation</li> <li>• Emphasize/highlight key concepts</li> <li>• Teacher Modeling</li> <li>• Peer Modeling</li> <li>• Label Classroom Materials - Word Walls</li> </ul>	<p>Students excelling in mastery of standards will be challenged with complex, high level challenges related to the topic.</p> <ul style="list-style-type: none"> <li>• Raise levels of intellectual demands</li> <li>• Require higher order thinking, communication, and leadership skills</li> <li>• Differentiate content, process, or product according to student’s readiness, interests, and/or learning styles</li> <li>• Provide higher level texts</li> <li>• Expand use of open-ended, abstract questions</li> <li>• Critical and creative thinking activities that provide an emphasis on research and in-depth study</li> <li>• Enrichment Activities/Project-Based Learning/ Independent Study</li> </ul> <p>Additional Strategies may be located at the links:</p> <ul style="list-style-type: none"> <li>❖ <a href="#">Gifted Programming Standards</a></li> <li>❖ <a href="#">Webb’s Depth of Knowledge Levels and/or Revised Bloom’s Taxonomy</a></li> <li>❖ <a href="#">REVISED Bloom’s Taxonomy Action Verbs</a></li> </ul>

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**Interdisciplinary Connections**

**ELA**

**NJSLSA.SL1** Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

**NJSLSA.SL2** Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

**NJSLSA.R7.** Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.

**NJSLSA.R10.** Read and comprehend complex literary and informational texts independently and proficiently with scaffolding as needed.

**NJSLSA.W4.** Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience

**RI.9-10.1** Accurately cite strong and thorough textual evidence, (e.g., via discussion, written response, etc.) and make relevant connections, to support analysis of what the text says explicitly as well as inferentially, including determining where the text leaves matters uncertain.

**RI.9-10.2** Determine a central idea of a text and analyze how it is developed and refined by specific details; provide an objective summary of the text.

**W.9-10.6** Use technology, including the Internet, to produce, share, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically.

**SL.9-10.5** Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance findings, reasoning, and evidence and to add interest.

**SL.9-10.6** Adapt speech to a variety of contexts and tasks, demonstrating command of formal English.

**RI.11-12.1** Accurately cite strong and thorough textual evidence, (e.g., via discussion, written response, etc.), to support analysis of what the text says explicitly as well as inferentially, including determining where the text leaves matters uncertain.

**RI.11-12.2** Determine two or more central ideas of a text, and analyze their development and how they interact to provide a complex analysis; provide an objective summary of the text.