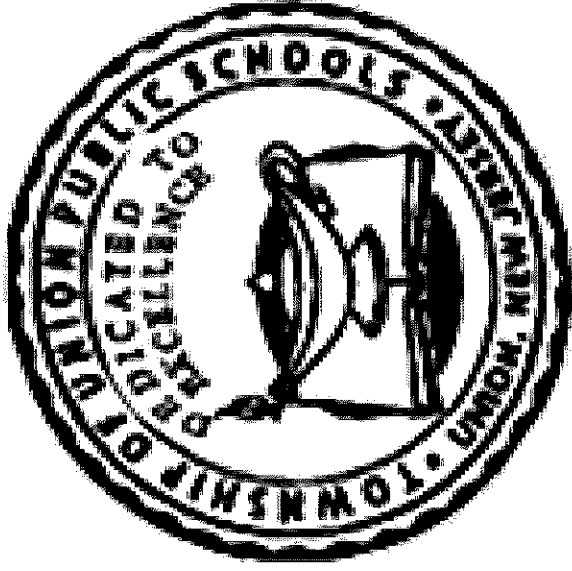


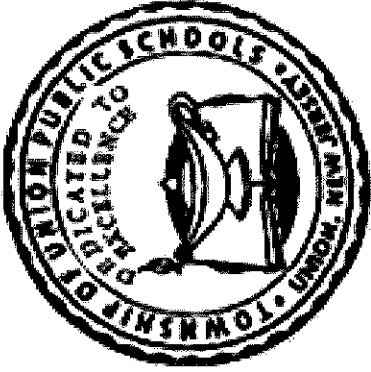
**TOWNSHIP OF UNION PUBLIC SCHOOLS**



**DRAFTING AND DESIGN / CAD IV**  
**TE 450**

**Curriculum Guide**

Curriculum Guide Approved June 2015



## **Board Members**

**David Arminio, President**

**Vito Nufrio, Vice President**

**Guy Francis**

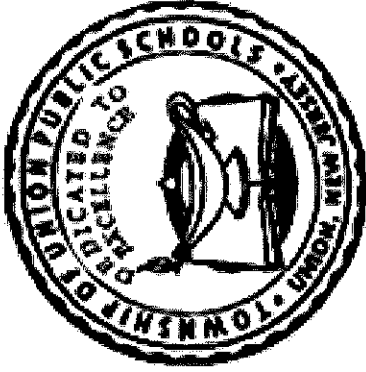
**Richard Galante**

**Lois Jackson**

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**Nancy Zuena**



**TOWNSHIP OF UNION PUBLIC SCHOOLS**  
Administration

**Superintendent** .....**Mr. Gregory Tatum**

**Assistant Superintendent** .....**Dr. Noreen Lishak**

**Director of Student Information/Technology** .....**Ms. Ann M. Hart**

**Director of Athletics, Health, Physical Education and Nurses**.....**Ms. Linda Ionta**

## DEPARTMENT SUPERVISORS

All Academic Areas K-2 .....	Ms. Maureen Corbett
Language Arts/Social Studies 3-5 .....	Mr. Robert Ghiretti
Mathematics/Science 3-5 .....	Ms. Theresa Matthews
Guidance K-12/SAC .....	Ms. Nicole Ahern
Language Arts.....	Ms. Mary Malyska
Math 8-12.....	Mr. Jason Mauriello
Science 6-12.....	Ms. Maureen Guilfoyle
Social Studies/Business.....	Ms. Libby Galante
World Language/ESL/Career Education/G&T/Computer Technology.....	Ms. Yvonne Lorenzo
Art/Music .....	Mr. Ronald Rago

**DRAFTING AND DESIGN / CAD IV**  
**TE 450**

**Curriculum Committee Members**

**Edwin Oyola**

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## **Mission Statement**

The Township of Union Board of Education believes that every child is entitled to an education designed to meet his or her individual needs in an environment that is conducive to learning. State standards, federal and state mandates, and local goals and objectives, along with community input, must be reviewed and evaluated on a regular basis to ensure that an atmosphere of learning is both encouraged and implemented. Furthermore, any disruption to or interference with a healthy and safe educational environment must be addressed, corrected, or when necessary, removed in order for the district to maintain the appropriate educational setting.

## **Philosophy Statement**

The Township of Union Public School District, as a societal agency, reflects democratic ideals and concepts through its educational practices. It is the belief of the Board of Education that a primary function of the Township of Union Public School System is to formulate a learning climate conducive to the needs of all students in general, providing therein for individual differences. The school operates as a partner with the home and community.

## **Statement of District Goals**

- **Develop reading, writing, speaking, listening, and mathematical skills.**
- **Develop a pride in work and a feeling of self-worth, self-reliance, and self-discipline.**
- **Acquire and use the skills and habits involved in critical and constructive thinking.**
- **Develop a code of behavior based on moral and ethical principles.**
- **Work with others cooperatively.**
- **Acquire a knowledge and appreciation of the historical record of human achievement and failures and current societal issues.**
- **Acquire a knowledge and understanding of the physical and biological sciences.**
- **Participate effectively and efficiently in economic life and the development of skills to enter a specific field of work.**
- **Appreciate and understand literature, art, music, and other cultural activities.**
- **Develop an understanding of the historical and cultural heritage.**
- **Develop a concern for the proper use and/or preservation of natural resources.**
- **Develop basic skills in sports and other forms of recreation**



## **Course Description**

**DRAFTING & DESIGN / CAD IV - Advanced**  
(prerequisites): **Intro to CAD, CAD II & CAD III)**

**Enrollment: Grades 12**

### **Purpose and Overview**

Students will be introduced to three-dimensional modeling so they can develop and enhance their drawing and computer skills under supervised independent study in three major areas: machine drafting, architecture and / or design and problem solving. Students will work independently creating primitives and composites, viewing and displaying three-dimensional models, model extrusions and revolutions, sweeps and lofts, mesh modeling, advanced surface modeling, Solid modeling, text and dimension in 3D, visual style settings, materials in AutoCAD, and renderings. Student will take the Autodesk / AutoCAD Certification Test.

## **Recommended Textbooks**

**Drafting and Design for Architecture & Construction** – Donald Hepler, Paul Wallach, Dana Hepler, Delmar Cengage Learning  
9<sup>th</sup> Edition

**AutoCAD and Its Applications: Comprehensive 2015** – Terence M Shumaker, David P. Madsen, Jeffrey A. Laurich,  
J.C. Malitzke, and Craig P. Black  
22<sup>nd</sup> Edition

## **Course Proficiencies**

**Students will be able to...**

### **CAD IV**

**At the completion of CAD IV the student will demonstrate:**

1. an advanced knowledge of AutoCAD 3D.
2. the ability to construct a 3d model house in autocad.
3. the ability to create cameras and show motion to view a model.
4. the ability to problem solve higher level projects
5. the ability to work in cooperative teams
6. the proper care for the computer and peripherals and equipment
7. appropriate classroom rules and regulations
8. the ability to prepare and pass the Autodesk / AutoCAD certification exam

## Curriculum Units

- Unit 1: Introduction to Three- Dimensional Modeling
- Unit 2: Creating Primitives and Composites
- Unit 3: Viewing and Displaying Three- Dimensional Mo.
- Unit 4: Understanding Coordinates and Systems
- Unit 5: Using Model Space Viewports
- Unit 6: Model Extrusions and Revolutions
- Unit 7: Sweeps and Lofts
- Unit 8: Creating and Working with Solid Model Features
- Unit 9: Mesh Modeling
- Unit 10: Advanced Surface Modeling
- Unit 11: Sub-object Editing
- Unit 12: Solid Model Editing
- Unit 13: Text and Dimensions in 3D
- Unit 14: Model Documentation, Analysis, and Point Clouds
- Unit 15: Visual Style Settings and Basic Rendering
- Unit 16: Materials in AutoCAD
- Unit 17: Lighting
- Unit 18: Advanced Rendering
- Unit 19: Using Show Motion to view a Model
- Unit 20: Cameras, Walkthroughs, and Flybys
- Unit 21: Autodesk / AutoCAD Certification

## Pacing Guide- Course

<u>Content</u>		<u>Number of Days</u>
<u>Unit 1:</u>	Introduction to Three- Dimensional Mo.	3 week block 15 days
<u>Unit 2:</u>	Creating Primitives and Composites	2 week block 10 days
<u>Unit 3:</u>	Viewing and Displaying Three- Dimen. Mo.	3 week block 15 days
<u>Unit 4:</u>	Understanding Coordinates and Systems	2 week block 10 days
<u>Unit 5:</u>	Using Model Space Viewports	3 week block 15 days
<u>Unit 6:</u>	Model Extrusions and Revolutions	4 week block 20 days
<u>Unit 7:</u>	Sweeps and Lofts	4 week block 20 days
<u>Unit 8:</u>	Creating and Working with Solid Mod. Feat.	4 week block 20 days
<u>Unit 9:</u>	Advanced Rendering	2 week block 10 days
<u>Unit 10:</u>	Using Show Motion to view a Model	2 week block 10 days
<u>Unit 11:</u>	Cameras, Walkthroughs, and Flybys	2 week block 10 days
<u>Unit 12:</u>	Autodesk / AutoCAD Certification	2 week block 10 days
		<b>33 weeks +/-</b> 3 weeks +/- testing, assessments, writing

## Unit 1:

Essential Questions	Instructional Objectives/ Skills and Benchmarks (CP/s)	Activities	Assessments
<p>What purpose does the right hand rule serve?</p> <p>Which three fingers are used in the right hand rule?</p> <p>What are the three coordinates needed to locate any point in 3d space?</p> <p>In a 2d drawing, what is the value for z coordinate?</p>	<p><b><u>SWAT:</u></b></p> <p>Describe how to locate points in 3d space.</p> <p>Describe the right hand rule of 3d visualization.</p> <p>Explain the function of the ribbon.</p> <p>Identify the functions of the viewport controls and the view cube.</p> <p>Set a visual Style Current.</p> <p><b>9.3.12.AC.1</b></p> <p><b>9.3.12.AC.2</b></p> <p><b>9.3.12.AC.6</b></p>	<p>Design a model with different viewpoints.</p> <p>Render the drawing.</p> <p>Using the visual style controls fly out in the viewport controls and set visual style current</p>	<ul style="list-style-type: none"><li>• Teacher observations</li><li>• Presentations</li><li>• Projects</li><li>• Rubrics</li><li>• Checklists</li><li>• Tests / quizzes</li><li>• Self-evaluation</li></ul>

**Unit 2:**

Essential Questions	Instructional Objectives/ Skills and Benchmarks (CPIs)	Activities	Assessments
<p>What is a solid Primitive?</p> <p>How is a solid cube created?</p> <p>Where is the center of a wedge located?</p> <p>How are two or more solids combined to make a composite solid?</p> <p>How can a 2d section view be converted to a 3d solid model?</p>	<p><b>SWAT:</b></p> <p>Explain the dynamic feedback presented when constructing solid primitives</p> <p>Remove portions of a solid using the subtract command.</p> <p>Create regions</p> <p><b>9.3.12.AC.1</b>  <b>9.3.12.AC.2</b>  <b>9.3.12.AC.6</b>  <b>9.3.12.AC-CST.4</b></p>	<p>Construct 3d solid primitives.</p> <p>Create a new solid from the common volume between two solids.</p> <p>Draw 2d objects in 3d.</p>	<ul style="list-style-type: none"> <li>• Teacher observations</li> <li>• Presentations</li> <li>• Projects</li> <li>• Rubrics</li> <li>• Checklists</li> <li>• Tests / quizzes</li> <li>• Self-evaluation</li> </ul>

### Unit 3:

Essential Questions	Instructional Objectives/ Skills and Benchmarks (CPIs)	Activities	Assessments
<p>Where is the thumbnail image of a new view displayed?</p> <p>How do you select a standard isometric preset view?</p> <p>What happens when one of the four view cube compass letters is picked?</p> <p>What is a steering wheel?</p>	<p><b>SWAT:</b></p> <p>Use viewports controls to display views.</p> <p>Use the navigation bar to perform a variety of display manipulation functions.</p> <p>Use the view cube to display orthographic plans.</p> <p>Use steering wheels to display any angles.</p> <p><b>9.3.12.AC.1</b> <b>9.3.12.AC.2</b> <b>9.3.12.AC.6</b> <b>9.3.12.AC-CST.4</b></p>	<p>Create and save views.</p> <p>Customize your navigation to fit your style.</p> <p>Reposition your toolbar so you can use your UCS.</p>	<ul style="list-style-type: none"><li>• Teacher observations</li><li>• Presentations</li><li>• Projects</li><li>• Rubrics</li><li>• Checklists</li><li>• Tests / quizzes</li><li>• Self-evaluation</li></ul>

**Unit 4:**

Essential Questions	Instructional Objectives/ Skills and Benchmarks (CPIs)	Activities	Assessments
<p>Explain spherical coordinate entry?</p> <p>What is a user coordinate system?</p> <p>How do you return to the wcs from any ucs?</p> <p>What is the function of the object option?</p>	<p><b><u>SWAT:</u></b></p> <p>Describe rectangular, spherical, and cylindrical methods of coordinate entry.</p> <p>Describe the function of the world and user coordinate systems.</p> <p>Use dynamic ucs.</p> <p>Use the UCS icon grips to move and rotate the ucs.</p> <p><b>9.3.12.AC.1</b>  <b>9.3.12.AC.6</b>  <b>9.3.12.AC-CST.4</b>  <b>9.3.12.AC-CST.8</b></p>	<p>Draw 3d polylines.</p> <p>Move the user coordinate system to any surface.</p> <p>Rotate the coordinate system to a 45 degree angle.</p> <p>Control ucs icon visibility in viewports.</p>	<ul style="list-style-type: none"> <li>• Teacher observations</li> <li>• Presentations</li> <li>• Projects</li> <li>• Rubrics</li> <li>• Checklists</li> <li>• Tests / quizzes</li> <li>• Self-evaluation</li> </ul>



**Unit 5:**

Essential Questions	Instructional Objectives/ Skills and Benchmarks (CPIs)	Activities	Assessments
<p>What is the purpose of viewpoints?</p> <p>How can named viewpoint configuration be redisplayed?</p> <p>What is the significance of the dominant viewpoint when two ports are joined?</p>	<p><b><u>SWAT:</u></b></p> <p>Describe the function of model space viewpoints.</p> <p>Use multiple viewpoints to construct a drawing.</p> <p>Analyze the next step to extrude an object.</p> <p><b>9.3.12.AC.1</b>  <b>9.3.12.AC.6</b>  <b>9.3.12.AC-CST.4</b>  <b>9.3.12.AC-DES.3</b></p>	<p>Create and save viewpoint configurations.</p> <p>Alter the current viewpoint configuration.</p> <p>Use</p>	<ul style="list-style-type: none"> <li>• Teacher observations</li> <li>• Presentations</li> <li>• Projects</li> <li>• Rubrics</li> <li>• Checklists</li> <li>• Tests / quizzes</li> <li>• Self-evaluation</li> </ul>

**Unit 6:**

Essential Questions	Instructional Objectives/ Skills and Benchmarks (CPIs)	Activities	Assessments
<p>What is an extrusion?</p> <p>How do you create a surface extrusion?</p> <p>What is the range in which a taper angle can vary?</p> <p>What are five different options for selecting the axis of revolution for a revolved solid</p>	<p><b>SWAT:</b></p> <p>Understand the concept of extrusion</p> <p>Learn how to revolve regions and surfaces.</p> <p>Understand surface modeling variable panels.</p> <p>Analyze a variety of modeling methods.</p> <p><b>9.3.12.AC.1</b>  <b>9.3.12.AC.6</b>  <b>9.3.12.AC-CST.4</b>  <b>9.3.12.AC-CST.8</b></p>	<p>Create solids and surfaces by extruding 2d profiles.</p> <p>Create symmetrical 3d solids and surfaces by revolving.</p> <p>Extrude and revolve objects using constraints.</p>	<ul style="list-style-type: none"> <li>• Teacher observations</li> <li>• Presentations</li> <li>• Projects</li> <li>• Rubrics</li> <li>• Checklists</li> <li>• Tests / quizzes</li> <li>• Self-evaluation</li> </ul>

**Unit 7:**

Essential Questions	Instructional Objectives/ Skills and Benchmarks (CPIs)	Activities	Assessments
<p>What is a loft?</p> <p>What is the purpose of the base point option?</p> <p>What is the difference between the ruled and smooth fit options?</p> <p>Which sweep command option is used to taper the sweep?</p> <p>Which objects may be used as a sweep path?</p>	<p><b><u>SWAT:</u></b></p> <p>Understand what needs to be lofted along a path.</p> <p>Control the loft with a path to secure proper angles.</p> <p>Understand smooth fit option to create smooth or rounded edges.</p> <p><b>9.3.12.AC.1</b>  <b>9.3.12.AC.2</b>  <b>9.3.12.AC.6</b>  <b>9.3.12.AC-CST.4</b></p>	<p>Create 3d solid surface objects by lofting a series of cross sections.</p> <p>Sweep shapes along a 2d or 3d path to create a solid surface object.</p> <p>Create a furniture leg.</p>	<ul style="list-style-type: none"> <li>• Teacher observations</li> <li>• Presentations</li> <li>• Projects</li> <li>• Rubrics</li> <li>• Checklists</li> <li>• Tests / quizzes</li> <li>• Self-evaluation</li> </ul>

**Unit 8:**

Essential Questions	Instructional Objectives/ Skills and Benchmarks (CPIs)	Activities	Assessments
<p>How does a 3d polar array differ from a 2d polar array?</p> <p>Which properties of a solid can be changed in the properties palette?</p> <p>What does the history property control?</p> <p>Name four types of surfaces that can be used to slice objects?</p>	<p><b><u>SWAT:</u></b></p> <p>Change properties on solids.</p> <p>Align objects.</p> <p>Chamfer solid objects.</p> <p>Slice a solid using various methods.</p> <p>Fillet solid objects.</p> <p>Mirror objects in three dimension.</p> <p><b>9.3.12.AC.1</b>  <b>9.3.12.AC.6</b>  <b>9.3.12.AC-CST.4</b>  <b>9.3.12.AC-DES.3</b></p>	<p>Create 3d arrays.</p> <p>Construct features on a solid model.</p> <p>Remove features from a solid model.</p> <p>Construct an 8" diameter, 90 degree elbow pipe fitting.</p>	<ul style="list-style-type: none"> <li>• Teacher observations</li> <li>• Presentations</li> <li>• Projects</li> <li>• Rubrics</li> <li>• Checklists</li> <li>• Tests / quizzes</li> <li>• Self-evaluation</li> </ul>

**Unit 9:**

Essential Questions	Instructional Objectives/ Skills and Benchmarks (CPIs)	Activities	Assessments
<p>Describe the three panes of the render window?</p> <p>What are the three possible destinations for render output?</p> <p>List the render presets autocad provides?</p> <p>What is the benefit of final gathering?</p> <p>Describe how create a custom render preset?</p>	<p><b>SWAT:</b></p> <p>Understand and gather information on how to configure settings.</p> <p>Identify the render window.</p> <p>Analyze the history pane of all renderings created..</p> <p>Understand illumination and presets.</p> <p><b>9.3.12.AC.1</b> <b>9.3.12.AC.2</b> <b>9.3.12.AC.6</b></p>	<p>Make advanced rendering settings.</p> <p>Set the resolution for a rendering.</p> <p>Save a rendering to an image file.</p> <p>Add fog / depth cueing to a scene.</p>	<ul style="list-style-type: none"> <li>• Teacher observations</li> <li>• Presentations</li> <li>• Projects</li> <li>• Rubrics</li> <li>• Checklists</li> <li>• Tests / quizzes</li> <li>• Self-evaluation</li> </ul>

**Unit 10:**

Essential Questions	Instructional Objectives/ Skills and Benchmarks (CPIs)	Activities	Assessments
<p>For what is the show motion tools used?</p> <p>What is a view category?</p> <p>Define view as it relates to the show motion tool?</p> <p>List six buttons on the show motion toolbar?</p>	<p><b>SWAT:</b></p> <p>Explain the show motion tool.</p> <p>Change the properties of a shot.</p> <p>Analyze camera drop down list.</p> <p>Change a shots view category and properties.</p> <p><b>9.3.12.AC.1</b>  <b>9.3.12.AC.2</b>  <b>9.3.12.AC.6</b>  <b>9.3.12.AC-CST.4</b></p>	<p>Create still shots of 3d models</p> <p>Create walk shots of 3d models.</p> <p>Create a cinematic shot of 3d models.</p> <p>Replay single shots and sequence of shots.</p>	<ul style="list-style-type: none"> <li>• Teacher observations</li> <li>• Presentations</li> <li>• Projects</li> <li>• Rubrics</li> <li>• Checklists</li> <li>• Tests / quizzes</li> <li>• Self-evaluation</li> </ul>

**Unit 11:**

Essential Questions	Instructional Objectives/ Skills and Benchmarks (CPIs)	Activities	Assessments
<p>Which system variable controls the display of camera glyphs?</p> <p>When is the camera preview window displayed?</p> <p>What is the field of view?</p> <p>How do you start recording a walkthrough or flyby?</p> <p>Which types of objects may be used as a motion path?</p>	<p><b><u>SWAT:</u></b></p> <p>Understand the control of a viewpoint.</p> <p>Identify the speed and quality of the animation.</p> <p>Understand how to make a camera.</p> <p>Understand how to change camera views.</p> <p><b>9.3.12.AC.1</b> <b>9.3.12.AC.2</b> <b>9.3.12.AC-CST.7</b></p>	<p>Create a camera to define a static 3d view.</p> <p>Create walkthroughs and flybys by following a path.</p> <p>Activate and adjust front and back clipping planes</p> <p>Record a flyby of a 3d model to a movie file.</p>	<ul style="list-style-type: none"> <li>• Teacher observations</li> <li>• Presentations</li> <li>• Projects</li> <li>• Rubrics</li> <li>• Checklists</li> <li>• Tests / quizzes</li> <li>• Self-evaluation</li> </ul>

**Unit 12:**

Essential Questions	Instructional Objectives/ Skills and Benchmarks (CPIs)	Activities	Assessments
<p>What is the purpose of certification?</p> <p>What information is needed to pass the certification test?</p> <p>What terminology is used in the test?</p> <p>What areas need review?</p>	<p><b>SWAT:</b></p> <p>Understand the concept of: Becoming certified, reflects your proven knowledge of drafting and design. Certification can enhance your credibility as a professional, improve your opportunities for promotion and provide a competitive edge in a highly technical job market</p> <p>When employers hire an Autodesk Certified Drafter, they know that the new employee meets certification criteria and that they have demonstrated initiative and pride in the profession by becoming certified. Thus, certification can serve as one criterion for differentiating among candidates in the selection process.</p> <p>Certification serves educators as a supplementary measurement of a student's performance on a recognized national level.</p>	<p>Students will review learned material to enhance knowledge in testable areas</p> <p>Assign students a variety of tests and quizzes to enhance proficiency.</p>	<ul style="list-style-type: none"> <li>• Teacher observations</li> <li>• Presentations</li> <li>• Projects</li> <li>• Rubrics</li> <li>• Checklists</li> <li>• Tests / quizzes</li> <li>• Self-evaluation</li> </ul>



New Jersey Core Curriculum Content Standards  
Academic Area

**9.3- Career & Technical Education (CTE)**  
**Content Area: 21<sup>st</sup> Century Life and Careers**

<b>CONTENT AREA:</b>	STANDARD 9.3 CAREER AND TECHNICAL EDUCATION
<b>ARCHITECTURE &amp; CONSTRUCTION CAREER CLUSTER</b>	
<b>Number</b>	Standard Statement
By the end of Grade 12, Career and Technical Education Program completers will be able to:	
<b>Career Cluster:</b>	<b>Architecture &amp; Construction (AC)</b>
9.3.12.AC.1	Use vocabulary, symbols and formulas common to architecture and construction.
9.3.12.AC.2	Use Architecture and construction skills to create and manage a project.
9.3.12.AC.3	Comply with regulations and applicable codes to establish and manage a legal and safe workplace.
9.3.12.AC.4	Evaluate the nature and scope of the Architecture & Construction Career Cluster and the role of architecture and construction in society and the economy.
9.3.12.AC.5	Describe the roles, responsibilities, and relationships found in the architecture and construction trades and professions, including labor/management relationships.
9.3.12.AC.6	Read, Interpret and use technical drawings, documents and specifications to plan a project.
9.3.12.AC.7	Describe career opportunities and means to achieve those opportunities in each of the Architecture & Construction Career Pathways.

<b>PATHWAY:</b>	<b>Construction (AC-CST)</b>
9.3.12.AC-CST.1	Describe contractual relationships between all parties involved in the building process.
9.3.12.AC-CST.2	Describe approval procedures required for successful completion of a construction project.
9.3.12.AC-CST.3	Implement testing and inspection procedures to ensure successful completion of a construction project.
9.3.12.AC-CST.4	Apply scheduling practices to ensure the successful completion of a construction project.
9.3.12.AC-CST.5	Apply practices and procedures required to maintain jobsite safety.
9.3.12.AC-CST.6	Manage relationships with internal and external parties to successfully complete construction projects.
9.3.12.AC-CST.7	Compare and contrast the building systems and components required for a construction project.
9.3.12.AC-CST.8	Demonstrate the construction crafts required for each phase of a construction project.
9.3.12.AC-CST.9	Safely use and maintain appropriate tools, machinery, equipment and resources to accomplish construction project goals.
<b>PATHWAY:</b>	<b>Design/Pre-Construction (AC-DES)</b>
9.3.12.AC-DES.1	Justify design solutions through the use of research documentation and analysis of data.
9.3.12.AC-DES.2	Use effective communication skills and strategies (listening, speaking, reading, writing and graphic communications) to work with clients and colleagues.
9.3.12.AC-DES.3	Describe the requirements of the integral systems that impact the design of buildings
9.3.12.AC-DES.4	Apply building codes, laws and rules in the project design.
9.3.12.AC-DES.5	Identify the diversity of needs, values and social patterns in project design, including accessibility standards.

9.3.12.AC-DES.6	Apply the techniques and skills of modern drafting, design, engineering and construction to projects.
9.3.12.AC-DES.7	Employ appropriate representational media to communicate concepts and project design.
9.3.12.AC-DES.8	Apply standards, applications and restrictions pertaining to the selection and use of construction materials, components and assemblies in the project design
<b>PATHWAY:</b>	<b>Maintenance/Operations (AC-MO)</b>
9.3.12.AC-MO.1	Recognize and employ universal construction signs and symbols to function safely in the workplace.
9.3.12.AC-MO.2	Use troubleshooting procedures when solving a maintenance problem in buildings.
9.3.12.AC-MO.3	Apply construction skills when repairing, restoring or renovating existing buildings.
9.3.12.AC-MO.4	Determine work required to repair or renovate an existing building.
9.3.12.AC-MO.5	Plan and practice preventative maintenance activities to service existing buildings.
9.3.12.AC-MO.6	Maintain and inspect building systems to achieve safe and efficient operation of buildings.

## New Jersey Scoring Rubric

### New Jersey Registered Holistic Scoring Rubric - GEPA/HSPA

In Scoring, consider the grid of written language	Inadequate Command	Limited Command	Partial Command	Adequate Command	Strong Command	Superior Command
Score	1	2	3	4	5	6
<b>Content &amp; Organization</b>	<ul style="list-style-type: none"> <li>May lack opening and/or closing</li> <li>Minimal response to topic; uncertain focus</li> <li>No planning evident; disorganized</li> </ul>	<ul style="list-style-type: none"> <li>Attempts to focus and/or closing</li> <li>Attempts to focus</li> <li>May drift or shift focus</li> <li>Attempts organization</li> <li>Few, if any, transitions between ideas</li> </ul>	<ul style="list-style-type: none"> <li>May lack opening and/or closing</li> <li>Usually has single focus</li> <li>Some lapses or flaws in organization</li> <li>May lack some transitions between ideas</li> </ul>	<ul style="list-style-type: none"> <li>Generally has opening and/or closing</li> <li>Single focus</li> <li>Ideas loosely connected</li> <li>Transition evident</li> </ul>	<ul style="list-style-type: none"> <li>Opening and closing</li> <li>Single focus</li> <li>Sense of unity and coherence</li> <li>Key ideas developed</li> <li>Logical progression of ideas</li> <li>Moderately fluent</li> <li>Attempts compositional risks</li> </ul>	<ul style="list-style-type: none"> <li>Opening and closing</li> <li>Single, distinct focus</li> <li>Unified and coherent</li> <li>Well-developed</li> <li>Logical progression of ideas</li> <li>Fluent, cohesive</li> <li>Compositional risks successful</li> </ul>
<b>Usage</b>	<ul style="list-style-type: none"> <li>Details random, inappropriate, or barely apparent</li> <li>No apparent control</li> <li>Severe/numerous errors</li> </ul>	<ul style="list-style-type: none"> <li>Details lack elaboration, i.e., highlight paper</li> <li>Numerous errors</li> </ul>	<ul style="list-style-type: none"> <li>Repetitious details</li> <li>Several unelaborated details</li> <li>Errors/ patterns of errors may be evident</li> </ul>	<ul style="list-style-type: none"> <li>Uneven development of details</li> <li>Some errors that do not interfere with meaning</li> </ul>	<ul style="list-style-type: none"> <li>Details appropriate and varied</li> <li>Few errors</li> </ul>	<ul style="list-style-type: none"> <li>Details effective, vivid, explicit, and/or pertinent</li> <li>Very few, if any, errors</li> </ul>
<b>Sentence Construction</b>	<ul style="list-style-type: none"> <li>Assortment of incomplete and/or incorrect sentences</li> </ul>	<ul style="list-style-type: none"> <li>Excessive monotony/ same structure</li> <li>Numerous errors</li> </ul>	<ul style="list-style-type: none"> <li>Little variety in syntax</li> <li>Some errors</li> </ul>	<ul style="list-style-type: none"> <li>Some errors that do not interfere with meaning</li> </ul>	<ul style="list-style-type: none"> <li>Few errors</li> </ul>	<ul style="list-style-type: none"> <li>Very few, if any, errors</li> </ul>
<b>Mechanics</b>	<ul style="list-style-type: none"> <li>Errors so severe they detract from meaning</li> </ul>	<ul style="list-style-type: none"> <li>Numerous serious errors</li> </ul>	<ul style="list-style-type: none"> <li>Patterns of errors evident</li> </ul>	<ul style="list-style-type: none"> <li>No consistent pattern of errors</li> <li>Some errors that do not interfere with meaning</li> </ul>	<ul style="list-style-type: none"> <li>Few errors</li> </ul>	<ul style="list-style-type: none"> <li>Very few, if any, errors</li> </ul>

## Holistic Scoring Guide for Mathematics Open-Ended (OE) Items (Generic Rubric)

### **3 - Point Response**

The response shows complete understanding of the problem's essential mathematical concepts. The student executes procedures completely and gives relevant responses to all parts of the task. The response contains few minor errors, if any. The response contains a clear, effective explanation detailing how the problem was solved so that the reader does not need to infer how and why decisions were made.

### **2 - Point Response**

The response shows nearly complete understanding of the problem's essential mathematical concepts. The student executes nearly all procedures and gives relevant responses to most parts of the task. The response may have minor errors. The explanation detailing how the problem was solved may not be clear, causing the reader to make some inferences.

### **1 - Point Response**

The response shows limited understanding of the problem's essential mathematical concepts. The response and procedures may be incomplete and/or may contain major errors. An incomplete explanation of how the problem was solved may contribute to questions as to how and why decisions were made.

### **0 - Point Response**

The response shows insufficient understanding of the problem's essential mathematical concepts. The procedures, if any, contain major errors. There may be no explanation of the solution or the reader may not be able to understand the explanation. The reader may not be able to understand how and why decisions were made.