Wallenpaupack Area School District
Planned Course Curriculum Guide

Visual Art Department

Art for Engineering

Course Description:

Art for Engineering is designed as an integrated course for the study of art and its application across multiple engineering disciplines. Students will explore the elements and principles of art and design while experiencing various methods and materials in both 2-D and 3-D. They will strengthen visual aesthetic skills while applying them to project-based engineering applications. Students will develop career-focused artifacts.

Initial Creation Date (if applicable) and Revision Dates:

12/3/25

Wallenpaupack Area School District Curriculum	
COURSE: Art for Engineering	**GRADE/S: 9-12**
UNIT 1: Foundations of Art and Engineering Design	**TIMEFRAME: 4 classes**

PA COMMON CORE/NATIONAL STANDARDS:

9.1.12 Know and use the elements and principles of each art form to create works in the arts and humanities. Visual Arts: color, form/shape, line, space, texture, value

All WAHS courses are aligned to the PA State Standards and Common Core Standards, where applicable.

UNIT OBJECTIVES (SWBATS):

Students will understand the connection between art and engineering design. Students will apply elements and principles of design to technical sketches and prototypes. Students will explore design thinking as a problem-solving process.

Key concepts: Design thinking process, visual communication in engineering, scale, proportion, and precision.

INSTRUCTIONAL STRATEGIES/ACTIVITIES:

- Lecture and discussion on design thinking and aesthetics in engineering.
- Analyze examples of engineered products with strong visual appeal.
- Create a technical sketch of a simple product using proper proportions.
- Introduce CAD/SketchUp software for basic modeling exercises.

ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):

Completion of class projects using the following rubric:

- Technique (25%): Mastery of the skills that are covered in unit/project.
- Craftsmanship (25%): Neatly crafted and completed.
- Creativity (25%): Original use of an idea, theme, concept or unique use of materials or principles.
- Professionalism (25%): Class Work—project work done during class time.

DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment):

- Demonstration and lecture
- Small group
- Practice activities
- Paraprofessional support
- Accommodations outlined in students' IEPs

RESOURCES (Technology Based Resources, Text Resources, etc.):

Student samples, YouTube, Internet resources

KEY VOCABULARY:	Proportion
Design Thinking	Orthographic Projection
Prototype	CAD/SketchUp

Scale	Rhythm
Balance	Unity
Contrast	Movement
Emphasis	Symmetry
Hierarchy	Functionality

Wallenpaupack Area School District Curriculum	
COURSE: Art for Engineering	**GRADE/S: 9-12**
UNIT 2: Technical Drawing and Visualization	**TIMEFRAME: 5 classes**

PA COMMON CORE/NATIONAL STANDARDS:

9.1.12 Know and use the elements and principles of each art form to create works in the arts and humanities. Visual Arts: color, form/shape, line, space, texture, value

All WAHS courses are aligned to the PA State Standards and Common Core Standards, where applicable.

UNIT OBJECTIVES (SWBATS):

Students will develop skills in technical drawing for engineering application. Students will use perspective and orthographic views to represent objects accurately. Students will apply rendering techniques for visual clarity.

Key concepts: Orthographic vs. isometric projection, line types and conventions, visual hierarchy in technical drawings.

INSTRUCTIONAL STRATEGIES/ACTIVITIES:

- Practice hand-drawn orthographic and isometric sketches.
- Create a rendered drawing of an engineered object with shading and color.
- Peer critique to evaluate clarity and accuracy of drawings.

ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):

Completion of class projects using the following rubric:

- Technique (25%): Mastery of the skills that are covered in unit/project.
- Craftsmanship (25%): Neatly crafted and completed.
- Creativity (25%): Original use of an idea, theme, concept or unique use of materials or principles.
- Professionalism (25%): Class Work—project work done during class time.

DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment):

- Demonstration and lecture
- Small group
- Practice activities
- Paraprofessional support
- Accommodations outlined in students' IEPs

RESOURCES (Technology Based Resources, Text Resources, etc.):

Student samples, internet resources, YouTube

KEY VOCABULARY:

Orthographic	Section view
Isometric	Rendering
Perspective Drawing	Visible Line
Auxiliary View	Hidden Line
Scale	Center Line
Emphasis	Line Weight
Extension Line	Alignment
Leader Line	Dimension Line
	Phantom Line

Wallenpaupack Area School District Curriculum	
COURSE: Art for Engineering	**GRADE/S: 9-12**
UNIT 3: Materials and Aesthetic Engineering	**TIMEFRAME: 4 classes**

PA COMMON CORE/NATIONAL STANDARDS:

9.1.12 Know and use the elements and principles of each art form to create works in the arts and humanities. Visual Arts: color, form/shape, line, space, texture, value

All WAHS courses are aligned to the PA State Standards and Common Core Standards, where applicable.

UNIT OBJECTIVES (SWBATS):

Students will explore material properties and their impact on design aesthetics. Students will understand how material choice affects function and appearance. Students will apply sustainable design principles.

Key concepts: Texture and finish in engineering design, sustainable materials, ergonomics and user-centered design.

INSTRUCTIONAL STRATEGIES/ACTIVITIES:

- Examine samples of different materials and discuss their aesthetic qualities.
- Design a product prototype considering both functionality and visual appeal.
- Group discussion on sustainability and material selection.

ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):

Completion of class projects using the following rubric:

- Technique (25%): Mastery of the skills that are covered in unit/project.
- Craftsmanship (25%): Neatly crafted and completed.
- Creativity (25%): Original use of an idea, theme, concept or unique use of materials or principles.
- Professionalism (25%): Class Work—project work done during class time.

DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment):

- Demonstration and lecture

- Small group
- Practice activities
- Paraprofessional support
- Accommodations outlined in students' IEPs

RESOURCES (Technology Based Resources, Text Resources, etc.):
Student samples, internet resources

KEY VOCABULARY:

Composite
Roughness
Tactile Texture
Visual Texture
Biodegradable
Upcycling
Life Cycle Assessment
Ergonomics
Sustainable Design
Surface Finish
Coating
Anodizing
Powder Coating
Carbon Footprint
Renewable Resource

Wallenpaupack Area School District Curriculum	
COURSE: Art for Engineering	**GRADE/S: 9-12**
UNIT 4: 3-D Modeling and Prototyping	**TIMEFRAME: 6 classes**

PA COMMON CORE/NATIONAL STANDARDS:
9.1.12 Know and use the elements and principles of each art form to create works in the arts and humanities. Visual Arts: color, form/shape, line, space, texture, value

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UNIT OBJECTIVES (SWBATS):
Students will apply sculptural and modeling techniques to engineering prototypes and understand spatial relationships and structural integrity. Students will explore additive and subtractive manufacturing processes.

Key concepts: Form and volume in engineering design, additive vs. subtractive processes, model-making for functional testing.

INSTRUCTIONAL STRATEGIES/ACTIVITIES:
- Demonstrate basic sculpting and model-building techniques.
- Create a 3-D prototype using foam, clay, or 3D printing.
- Discuss how aesthetics influence usability and marketability.

ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):
Completion of class projects using the following rubric:
- Technique (25%): Mastery of the skills that are covered in unit/project.

- Craftsmanship (25%): Neatly crafted and completed.
- Creativity (25%): Original use of an idea, theme, concept or unique use of materials or principles.
- Professionalism (25%): Class Work—project work done during class time.

DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment):

- Demonstration and lecture
- Small group
- Practice activities
- Paraprofessional support
- Accommodations outlined in students' IEPs

RESOURCES (Technology Based Resources, Text Resources, etc.):
Student samples, YouTube, internet resources

KEY VOCABULARY:	Additive Manufacturing
Armature	Subtractive Manufacturing
Volume	Structural Integrity
Profile	Fit and Finish
Scale	Casting
Form	Fabrication
Massing	Prototype
Contour	Scale Model

Wallenpaupack Area School District Curriculum	
COURSE: Art for Engineering	**GRADE/S: 9-12**
UNIT 5: Digital Visualization and Rendering	**TIMEFRAME: 6 classes**

PA COMMON CORE/NATIONAL STANDARDS:
9.1.12 Know and use the elements and principles of each art form to create works in the arts and humanities. Visual Arts: color, form/shape, line, space, texture, value

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UNIT OBJECTIVES (SWBATS):
Students will use digital tools to create realistic renderings of engineered designs, apply color theory and lighting for visual impact, and prepare presentation graphics for engineering proposals.

Key concepts: Digital rendering techniques, lighting and shadow for realism, texture mapping and material simulation.

INSTRUCTIONAL STRATEGIES/ACTIVITIES:

- Create a digital rendering of a product using CAD or design software.
- Experiment with different finishes and lighting effects.

- Present renderings in a professional layout for critique.

ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):
Completion of class projects using the following rubric:

- Technique (25%): Mastery of the skills that are covered in unit/project.
- Craftsmanship (25%): Neatly crafted and completed.
- Creativity (25%): Original use of an idea, theme, concept or unique use of materials or principles.
- Professionalism (25%): Class Work—project work done during class time.

DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment):

- Demonstration and lecture
- Small group
- Practice activities
- Paraprofessional support
- Accommodations outlined in students' IEPs

RESOURCES (Technology Based Resources, Text Resources, etc.):
Student samples, internet resources

KEY VOCABULARY: Rendering Texture Mapping Bump Map Ray Tracing Reflectivity	Back Light Key Light Fill Light Visualization Secularity Translucency

Wallenpaupack Area School District Curriculum	
COURSE: Art for Engineering	**GRADE/S: 9-12**
UNIT 6: Ceramic Form and Structural Design	**TIMEFRAME: 10 classes**

PA COMMON CORE/NATIONAL STANDARDS:
9.1.12 Know and use the elements and principles of each art form to create works in the arts and humanities. Visual Arts: color, form/shape, line, space, texture, value

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UNIT OBJECTIVES (SWBATS):
Students will understand the properties of clay and its applications in engineering design. Students will explore form, balance, and structural integrity through ceramic construction. Students will apply principles of design to create functional or conceptual ceramic pieces.

Key concepts: Clay body types and their engineering uses, structural stability in ceramic forms, surface treatment and finishing techniques.

INSTRUCTIONAL STRATEGIES/ACTIVITIES:

- Demonstrate clay preparation and basic hand-building techniques.
- Students design and construct a ceramic object inspired by an engineering concept (e.g., architectural component, mechanical part).
- Discuss how ceramics are used in engineering (e.g., insulators, aerospace components).
- Apply surface treatments (texture, glaze) for aesthetic and functional qualities.

ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):

Completion of class projects using the following rubric:

- Technique (25%): Mastery of the skills that are covered in unit/project.
- Craftsmanship (25%): Neatly crafted and completed.
- Creativity (25%): Original use of an idea, theme, concept or unique use of materials or principles.
- Professionalism (25%): Class Work—project work done during class time.

DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment):

- Demonstration and lecture
- Small group
- Practice activities
- Paraprofessional support
- Accommodations outlined in students' IEPs

RESOURCES (Technology Based Resources, Text Resources, etc.):

Student samples, internet resources

KEY VOCABULARY:

Structural Integrity
Greenware
Slip
Incise
Additive
Subtractive
Kiln
Assemblage
Bisque
Texture
Hand-building
Wedging
Glaze
Free-standing
Firing
Pinch
Scoring
Symmetry/Asymmetry
Earthenware
Leather-hard

Wallenpaupack Area School District Curriculum	
COURSE: Art for Engineering	**GRADE/S: 9-12**
UNIT 7: Career-Focused Engineering Art Portfolio	**TIMEFRAME: 10 classes**

PA COMMON CORE/NATIONAL STANDARDS:

9.1.12 Know and use the elements and principles of each art form to create works in the arts and humanities. Visual Arts: color, form/shape, line, space, texture, value

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UNIT OBJECTIVES (SWBATS):

Students will compile a portfolio showcasing integrated art and engineering projects. Students will reflect on interdisciplinary applications and career pathways. Students will present work professionally with annotations and designer statements.

Key concepts: Professional presentation, sequential organization, designer statement for engineering context.

INSTRUCTIONAL STRATEGIES/ACTIVITIES:

- Assemble works from previous units into a cohesive portfolio.
- Write a designer statement connecting art and engineering principles.
- Conduct peer critique and final presentation for evaluation.

ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):

Completion of class projects using the following rubric:

- Technique (25%): Mastery of the skills that are covered in unit/project.
- Craftsmanship (25%): Neatly crafted and completed.
- Creativity (25%): Original use of an idea, theme, concept or unique use of materials or principles.
- Professionalism (25%): Class Work—project work done during class time.

DIFFERENTIATED INSTRUCTION (Acceleration/Enrichment):

- Demonstration and lecture
- Small group
- Practice activities
- Paraprofessional support
- Accommodations outlined in students' IEPs

RESOURCES (Technology Based Resources, Text Resources, etc.):

Student samples

KEY VOCABULARY:

Portfolio
Layout
Prototype
Narrative