PTE-303 Engineering Drawing CAD DoDEA Career and Technical Education Competencies

About the Program:

Engineering Drawing - CAD prepares students for careers in science, technology, engineering and math. The course sequence focuses on duties and tasks performed by professionals in engineering and engineering technology as well as pre-employment and employment skills.

Major Concepts/Content: This course is recommended for students interested in engineering or related careers and/or aspiring to become engineers, architects, and engineer technicians. Engineering drawing is a Computer Aided Drawing and Design (CAD) course designed to provide students with instruction in computer graphic skills and design fundamentals. Students will learn the use of a CAD system for two-dimensional drawing and three-dimensional modeling. Through the use of the Internet students will explore the wide range of CAD technologies and applications.

Major Instructional Activities: Engineering Drawing will cover a thorough introduction to the fundamental concepts and principles of technical drawings. This will help the student to communicate with others by being able to draw as well as interpret drawings and sketches. The student will complete drawing and learn concepts from the following areas: but is not limited to, pictorial, multi-view, geometric construction, sectional views, dimensioning, threads and fasteners, and assembly drawings. Instructional activities are provided in the pre-engineering laboratory, using hands-on experiences with equipment and materials related to course content. Students will be required to plan and produce projects. They will develop solutions to problem solving activities, present ideas and information orally and in writing. Students will investigate content-related occupations and assume leadership roles and work cooperatively.

Major Evaluative Techniques: Course work completed will be analyzed and evaluated for accuracy and use of drawing concepts. Reports will be graded for content and form. In addition, the students will be evaluated on their ability to cooperatively work together and solve problems.

Essential Software: The focus of this course will be the use of the Autodesk Suite to design forms, model complex shapes and design in 3D.

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PTE-303 36 weeks	Engineering Drawing **TASKS/COMPETENCIES**
Implementing DoDEA's CTE Course Requirements	
• 001	Demonstrate DoDEA's Workplace Readiness Skills in course activities.
• 002	Identify issues related to this field of study that affect the environment and impact local and global communities.
• 003	Identify Internet safety issues and procedures for complying with acceptable use standards.
Investigating the Engineering Profession and Related Careers	
• 004	Explain the purpose and functions of the engineering design team.
• 005	Apply safety rules to laboratory activities.
• 006	Explain and/or demonstrate the correct use of industry terms, behaviors, methods and best practices.
• 007	Summarize the characteristics of professional engineers.
Relating Objectives of the Course to Students in a Technological World	
• 008	Identify the type of coursework needed to become an engineer.
• 009	Compare the different types of specialty fields within architecture.
• 010	Describe career qualifications, responsibilities, and wages using various resources and the Internet.
• 011	Use appropriate computer application programs to solve problems.
Engineering Drawing and the Engineering Design Process	
• 012	Describe how the Engineering Drawing fits into the Engineering Design Process
• 013	Compare and contrast Engineering Drawing within the different disciplines of Engineering
• 014	Create a path/timeline of a part drawing from idea to production line
• 015	Employ appropriate terminology
Sketching Skills	
• 016	Develop basic hand drawing skills
• 017	Create orthographic views of simple objects
• 018	Create Isometric views of simple objects
• 019	Employ appropriate terminology
Part Creation	
• 020	Discuss component creation techniques for 2D and/or 3D environments
• 021	Create components in a 2D and/or 3D environment
• 022	Modify components in a 2D and/or 3D environment
• 023	Employ appropriate terminology
Assembly Creation	
• 024	Discuss assembly creation techniques for 2D and/or 3D environments
• 025	Create 2D and/or 3D assemblies from individual components
• 026	Modify assembly in a 2D and/or 3D environment
• 027	Employ appropriate terminology
Dimension Skills	
• 028	Discuss dimensioning types and techniques for 2D and/or 3D environments
• 029	Dimension 2D and/or 3D assemblies from individual components
• 030	Modify dimensions in a 2D and/or 3D environment
• 031	Employ appropriate terminology
View Skills	
• 032	Understand appropriate uses of different types of views
• 033	Create:

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	• Isometric views • Orthographic views • Projected views • Section views • Detail views
• 034	Employ appropriate terminology
Sheet Skills	
• 035	Understand the purpose of sheet drawings
• 036	Understand appropriate uses of: • Title blocks • Notes • Bill of materials • View Placement • Revisions • Create sheet sets for selected projects
• 037	Employ appropriate terminology
Capstone project research	
• 038	Select topic for final project • Topic approval
• 039	Set deliverables and timeline
• 040	Develop a plan for CAD project
Capstone project build	
• 041	Utilize all CAD skills to create the desired
Capstone project presentation	
• 042	Develop portfolio containing representative examples of student work
• 043	Prepare and deliver final project