

**CERRITOS COLLEGE**

**ENGINEERING DESIGN TECHNOLOGY, ENGINEERING TECHNOLOGY, AND NEW PRODUCT DEVELOPMENT PROGRAMS  
TECHNICAL STANDARDS/ESSENTIAL FUNCTIONS**

The following listing has been prepared to assist you in understanding the technical standards of the Engineering Design Technology, Engineering Technology, and New Product Development programs in order to affiliate in the industry and ultimately practice the profession. The technical standards as stated herewith are not conditions of admission to a program of study. Rather, they reflect performance abilities that are necessary for a student to successfully complete the requirements of the specified Technology program.

The purpose of this document is to notify prospective Engineering Design Technology, Engineering Technology, and New Product Development students of these technical standards to enable them to make an informed decision regarding enrollment in the Engineering Design Technology, Engineering Technology, and New Product Development programs at Cerritos College.

The delivery of safe, effective practice requires that students be able to perform functions related to the technical standards outlined here. The inability of a student to perform these functions may result in the student being unable to meet course objectives and to progress in the Engineering Design Technology, Engineering Technology, and New Product Development programs. Additionally, if a student is unable to perform these required competencies, the student may pose a risk of harm to the customer(s) for whom service is provided.

All applicants meeting the appropriate academic requirements shall be considered equally for admission to Cerritos College or any academic program regardless of physical or mental disability, gender, gender identity, gender expression, nationality, race or ethnicity, religion, sexual orientation, age, marital status, or genetic information. (Education Code section 66270, Government Code section 11135, Penal Code section 422.6)

<b>Technical Standards Essential Function</b>	<b>Standard Performed Description</b>	<b>Examples of Activities (Not All Inclusive)</b>
<b>Cognitive Ability</b>	<ul style="list-style-type: none"> <li>• Demonstrate ability to use logic and technical analysis to identify the strengths and weaknesses of different approaches to design.</li> <li>• Demonstrate personal time management to complete projects by given deadlines.</li> <li>• Exhibit ability to translate written and/or verbal information into actual projects.</li> <li>• Demonstrate ability to execute work requirements in accordance with written and oral instructions.</li> </ul>	<ul style="list-style-type: none"> <li>• Establish and manage time requirements for designing part or assembly.</li> <li>• Demonstrate judgment and decision making as required to organize various tasks to complete design or drafting assignments and projects.</li> <li>• Determine solutions and procedures to guarantee conformance with user needs/design input or specifications.</li> <li>• Use self-evaluation of performance to determine new approaches for personal improvement.</li> </ul>

	<ul style="list-style-type: none"> <li>Exhibit deductive reasoning.</li> </ul>	<ul style="list-style-type: none"> <li>Exhibit the ability to analyze documentation like blueprints and specifications and then use this knowledge to envision, design and draft the manufacturable part.</li> <li>Accept constructive criticism from instructor and implement recommendations and/or solutions for improvement.</li> </ul>
<b>Technical Standards Essential Function</b>	<b>Standard Performed Description</b>	<b>Examples of Activities (Not All Inclusive)</b>
<b>Communication Ability</b>	<ul style="list-style-type: none"> <li>Demonstrate use of multiple approaches to convey information.</li> <li>Demonstrate ability to follow verbal directions.</li> <li>Demonstrate ability to follow written directions.</li> <li>Discuss directions and methods required to complete a specific engineering design task.</li> <li>Demonstrate use of industry specific engineering design terms to communicate information.</li> </ul>	<ul style="list-style-type: none"> <li>Use a variety of strategies to convey the necessary design intent information required to complete a specific design task or project.</li> <li>Discuss available alternatives and methods that may be used to accomplish the objective.</li> <li>Use oral expression, reading, and writing comprehension to verify the information was received.</li> <li>Use engineering design terms to represent information on blueprints, projects, work orders, and engineering procedure specifications.</li> </ul>
<b>Interpersonal/ Intrapersonal Skills and Behavior</b>	<ul style="list-style-type: none"> <li>Demonstrate awareness of other people’s reactions and understand why they react the way they do and how you can improve the reception of your work.</li> <li>Demonstrate ability to identify the nature of problems.</li> <li>Demonstrate ability to collaborate with others in a group.</li> <li>Demonstrate ability to maintain and control self-behavior in a group setting.</li> </ul>	<ul style="list-style-type: none"> <li>Demonstrate respect for individual differences.</li> <li>Assist peers in resolving problems or conflicts.</li> <li>Respond appropriately to emergencies.</li> <li>Work cooperatively within a group to achieve a goal.</li> <li>Maintain appropriate self-behavior in a group and/or social environment like a classroom lecture or laboratory demonstration.</li> </ul>

Technical Standards Essential Function	Standard Performed Description	Examples of Activities (Not All Inclusive)
<b>Visual Ability</b>	<ul style="list-style-type: none"> <li>• Exhibit recommended 20/20 vision -natural or corrected.</li> <li>• Exhibit accurate vision from 6” to 36” required.</li> <li>• Demonstrate ability to perform required task in both low and bright lighted environments.</li> <li>• Demonstrate ability to visually obtain information from technical drawings or written standards.</li> </ul>	<ul style="list-style-type: none"> <li>• Perform evaluation, parts inspection/measurements, and blueprint reading from 6” to 36” with natural vision or corrected vision with contacts or glasses.</li> <li>• Identify visually material discontinuities and defects like: size, shape, undercut, or cracks.</li> <li>• Precision use of tools and measurement devices such as dial calipers, micrometers, height gages, or others using the thousandths or ten-thousandths scale.</li> <li>• Demonstrate ability to read detailed orthographic blueprints, symbols, and engineering procedure specifications.</li> </ul>
<b>Auditory Ability</b>	<ul style="list-style-type: none"> <li>• Demonstrate hearing ability sufficient to communicate with peers in close or far proximity.</li> <li>• Demonstrate hearing awareness of potentially hazardous industrial equipment.</li> <li>• Demonstrate ability to hear, feel or visually see alarms, bells, sirens, and various other safety alerts.</li> <li>• Demonstrate ability to detect and/or identify equipment or tools under load and/or being strained.</li> <li>• Tolerate exposure to extremely noisy and loud environments.</li> </ul>	<ul style="list-style-type: none"> <li>• Communicate effectively with other engineers, designers, machinists or coworkers inside of an industrial shop or in the field by voice, loud speaker, phone, and/or two way radio.</li> <li>• Hear and detect safety hazards.</li> <li>• Hear and detect industrial equipment problems, overloading, and/or failures.</li> <li>• Demonstrate ability to properly identify machines under load and to take precaution in working in a hazardous industrial environment.</li> <li>• Demonstrate ability to concentrate and perform surveying, sketching and inspections duties while being exposed to an industrial noisy environment for lengthy periods of time.</li> </ul>

Technical Standards Essential Function	Standard Performed Description	Examples of Activities (Not All Inclusive)
<b>Tactile Ability</b>	<ul style="list-style-type: none"> <li>• Demonstrate tactile ability sufficient for physical control of tools and equipment.</li> <li>• Demonstrate manual hand dexterity with repetitive precision movements and techniques.</li> <li>• Demonstrate ability to manually manipulate small parts less than 1/16" in diameter.</li> <li>• Demonstrate ability to tactically use multiple extremities simultaneously.</li> <li>• Demonstrate ability to use finger and hand pressure to grip various shaped objects.</li> </ul>	<ul style="list-style-type: none"> <li>• Perform functions of physical control with various measuring, inspection and disassembly tools and equipment</li> <li>• Perform repetitive keyboard and mouse movements in multiple positions with both hands simultaneously.</li> <li>• Demonstrate ability to have individual hands perform different manual functions simultaneously. One hand holding a part and the other measuring one of the part's characteristics.</li> <li>• Manipulate small parts tactically with hands and fingers.</li> <li>• Perform inspection and measurement operations using both hands.</li> </ul>
<b>Olfactory Ability</b>	<ul style="list-style-type: none"> <li>• Demonstrate ability sufficient to detect contaminant odors in the workplace.</li> <li>• Demonstrate ability to detect gas leaks.</li> <li>• Exhibit identification ability when working with chemicals, solvents, and petroleum based liquids.</li> <li>• Demonstrate ability to detect various burning materials.</li> <li>• Demonstrate ability to detect electrical and/or burning synthetic materials.</li> </ul>	<ul style="list-style-type: none"> <li>• Detect hazardous and/or objectionable fumes.</li> <li>• Detect specific flammable leaks in a manufacturing environment.</li> <li>• Detect various burning materials.</li> <li>• Detect smells that represent a potential hazard such as smoke from a fire or burning electrical equipment and/or synthetic materials.</li> <li>• Tolerate the normal smells and fumes produced by manufacturing processes, such as machine coolant, composites resins, molten plastics, solvent, etc.</li> </ul>

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<b>Strength and Mobility</b>	<ul style="list-style-type: none"> <li>• Demonstrate ability to push and pull equipment.</li> <li>• Demonstrate ability to lift and move projects</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrate ability to pick up and carry objects.</li> <li>• Demonstrate ability to work in numerous positions from on the ground to overhead as well as over, under, and around parts, projects and/or structures.</li> </ul>
<b>Motor Skills</b>	<ul style="list-style-type: none"> <li>• Demonstrate physical abilities including: standing, sitting, walking, stooping, crawling, reaching, squatting, lifting, and bending.</li> <li>• Exhibit full range-of-motion of all extremities.</li> <li>• Demonstrate balance sufficient to conduct precision repetitive movements.</li> <li>• Demonstrate ability to keep balance and equilibrium when in various physical positions.</li> <li>• Demonstrate ability to perform controlled accurate movements, motor skills, and techniques with both hands and both arms independently and/or simultaneously.</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrate ability to perform physical engineering operations in an industrial laboratory while wearing all required personal protective equipment.</li> <li>• Perform various engineering tasks while the body is in an awkward and/or uncomfortable position for extended periods of time.</li> <li>• Demonstrate ability to perform repetitive physical movements and motor skills intermittently and/or continuously for extended periods of time.</li> <li>• Demonstrate ability to continuously improve and further develop manual motor skills and engineering techniques.</li> <li>• Demonstrate ability to develop and refine manual dexterity motor skills to implement various engineering techniques required to produce acceptable parts.</li> </ul>

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<b>Physical Endurance</b>	<ul style="list-style-type: none"> <li>• Demonstrate sufficient physical endurance to complete assigned design engineering work.</li> <li>• Perform industrial work activities for up to 8 hours while wearing required safety equipment.</li> <li>• Demonstrate ability to work with hands and arms extended overhead or below the waist for long periods of time.</li> <li>• Demonstrate ability to perform manual activities with inspection, test and measurement equipment for extended periods of time.</li> <li>• Demonstrate ability to work long extended overtime hours including weekends.</li> <li>• Demonstrate physical endurance to perform work duties in environments like when ambient temperatures exceed 100° F.</li> </ul>	<ul style="list-style-type: none"> <li>• Sit and/or stand for up to 8 hours a day operating computer keyboard and mouse, lab equipment, and/or industrial equipment.</li> <li>• Make repetitive motions (measurements and inspections) for several hours with the hands, wrists, arms, and feet.</li> <li>• Perform manual operations for extended periods of time.</li> <li>• Perform surveying, inspection, measurement, sampling, production, and sketching for up to 8 hours while wearing all required personal protective equipment while utilizing and working with measurement and inspection equipment.</li> <li>• Perform strenuous engineering and cutting activities in adverse conditions and environments that may be hot, cold, dusty, windy, noisy, and/or in direct sunlight.</li> </ul>

Technical Standards Essential Function	Standard Performed Description	Examples of Activities (Not All Inclusive)
<b>Environmental Tolerance</b>	<ul style="list-style-type: none"> <li>• Demonstrate ability to function safely in an industrial laboratory environment.</li> <li>• Demonstrate ability to work in extremely hot, dusty, noisy environments.</li> <li>• Demonstrate ability to work in highly ventilated and/or forced air environments.</li> <li>• Demonstrate ability to work inside for extended periods of time.</li> <li>• Tolerate exposure to industrial and lab equipment and other potentially hazardous equipment.</li> </ul>	<ul style="list-style-type: none"> <li>• Adapt and work in congested areas and/or confined spaces like a small engineering or inspection area.</li> <li>• Perform surveying and inspection tasks and work in hot, dusty, noisy and/or highly ventilated forced air environments.</li> <li>• Tolerate odors and fumes associated with various manufacturing operations.</li> <li>• Work indoors while wearing full protective safety equipment.</li> <li>• Tolerate exposure to an environment that contains industrial hazards like: heavy parts and metals, flammable gasses, sharp objects, metal saws, grinders, hydraulic and electrical equipment.</li> </ul>

**Disability Statement:**

*If you have a disability or acquire one, you may be entitled to receive support services and/or accommodations intended to assure you an equal opportunity to participate in, and benefit from, the program. Reasonable accommodations for students with disability related needs will be determined on an individual basis taking into consideration the standards and essential skills which must be performed to meet the program objectives. To receive more information or to apply for services, please contact the Center for Access and Disability Services (CADS) at (562) 860-2451 ext. 2335 or (562) 274-7164 (VP), or visit them in the Santa Barbara Building. All prospective and current Engineering Design Technology, Engineering Technology, and New Product Development students must be able to meet these standards with or without reasonable accommodations.*