

<b>TSC Category</b>	Technical and Engineering Design					
<b>TSC</b>	Computer-aided Design Application					
<b>TSC Description</b>	Use computer-aided design software and tools to design products, components and parts for manufacture					
<b>TSC Proficiency Description</b>	<b>Level 1</b>	<b>Level 2</b>	<b>Level 3</b>	<b>Level 4</b>	<b>Level 5</b>	<b>Level 6</b>
			<b>AER-DES-3044-1.1</b>	<b>AER-DES-4044-1.1</b>	<b>AER-DES-5044-1.1-1</b>	
			Create three-dimensional (3D) solid models, assembly drawings and detail drawings of components for manufacturing using computer-aided design (CAD) software	Perform engineering analyses using simulation and analysis tools and methods to assist in making engineering decisions	Design parts and assemblies, in compliance with drawing standards, using computer-aided design (CAD) systems	
<b>Knowledge</b>			<ul style="list-style-type: none"> <li>International and industry drawing and design practices and standards</li> <li>CAD practices and applications</li> <li>Types of engineering tables and catalogues, electronic searches and databases relevant to CAD</li> <li>Application of library catalogues, development and use of object libraries</li> <li>Types of CAD drawings, drawing and drafting symbols and dimensioning and projection lines</li> <li>Geometrical constructions of two-dimensional (2D) and three-dimensional (3D) objects</li> <li>Techniques of solid modelling</li> <li>Orthogonal projections</li> <li>Sectioning methods</li> <li>Fits and tolerances</li> <li>Drawing documentation</li> </ul>	<ul style="list-style-type: none"> <li>Theory and concept of finite element analysis</li> <li>Concepts of basic structural dynamics</li> <li>Concepts of rigid and flexible dynamic analysis</li> <li>Concepts of heat transfer analysis</li> <li>Non-linear thermal and transient analyses</li> <li>Concepts of structural contact and fatigue analysis</li> <li>Concepts of turbulence flow modelling</li> <li>Concepts of rotating machinery simulation</li> <li>Geometry creation and meshing</li> <li>Solution setting, optimisation setup and parameters setting operations</li> <li>Types and procedures of pre-processing, solving and post-processing industry-specific analyses</li> </ul>	<ul style="list-style-type: none"> <li>International and industry drawing and design practices and standards</li> <li>Applications of CAD</li> <li>Analytical techniques for three-dimensional (3D) modelling</li> <li>Concepts of 3D CAD solid modelling, co-ordinate systems, datum and planes, primitive features, curves, sketches and drafting in engineering</li> <li>Assembly techniques</li> <li>Principles and techniques of material selection</li> <li>Concept and principles of geometric dimensioning and tolerancing (GD&amp;T)</li> <li>Communication of design through drafting</li> </ul>	

**SKILLS FRAMEWORK FOR AEROSPACE  
TECHNICAL SKILLS AND COMPETENCIES (TSC) REFERENCE**

<p><b>Abilities</b></p>			<ul style="list-style-type: none"> <li>• Interpret international drawing conventions and standards</li> <li>• Carry out measurements required for preparation of drawings</li> <li>• Generate preliminary design drawings, in accordance with design specifications</li> <li>• Create wire mesh models, surfaces and 3D solid models in isometric view</li> <li>• Create assembly drawings from the 3D models</li> <li>• Create detail drawings for each part of the assembly</li> <li>• Apply rendering techniques to render solid models, according to specified criteria</li> <li>• Create library of components to enhance speed of work</li> <li>• Document drawings and associated data</li> <li>• Return printed copies of all authorised drawings or CAD files after use</li> </ul>	<ul style="list-style-type: none"> <li>• Perform pre-processing for mechanical stress simulations</li> <li>• Perform structural contact</li> <li>• Perform post-processing for mechanical stress simulations</li> <li>• Perform assignment of material properties, including Wohler curves (S-N curves)</li> <li>• Perform post-processing for results with fatigue tools for stress and strain life</li> <li>• Perform geometry creation and meshing</li> <li>• Perform board level simulation analyses</li> <li>• Perform meshing and non-conformal meshing</li> <li>• Complete solution setting, optimisation set-ups and parameters setting operations</li> <li>• Evaluate and conduct post-processing</li> <li>• Conduct computational fluid dynamics (CFD) analyses with single reference frame (SRF), multiple reference frame (MRF) and sliding mesh (SMM)</li> </ul>	<ul style="list-style-type: none"> <li>• Identify design constraints, functions and specifications, in accordance with design requirements</li> <li>• Plan design scopes, budgets and schedules, in accordance with design requirements</li> <li>• Verify materials, machining and manufacturing processes and relevant technical information, in accordance with design specifications</li> <li>• Conceptualise part designs to meet functional requirements</li> <li>• Generate parts using sketches, explicit curves and primitive features</li> <li>• Generate CAD models for parts</li> <li>• Create top-down and bottom-up assemblies</li> <li>• Produce module assembly drawings</li> <li>• Produce exploded view for assemblies</li> <li>• Create animations for assemblies</li> <li>• Create models in orthographic view</li> <li>• Apply GD&amp;T principles in producing drafts and models</li> <li>• Produce detailed drawings with dimensions for parts, in compliance with drawing standards</li> <li>• Review final designs for possible improvements, according to specifications</li> </ul>	
-------------------------	--	--	---	---	--	--

