

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

TSC Category	Aerospace and Engineering Fundamentals					
TSC	Physics Concepts Application					
TSC Description	Apply physics concepts to solve engineering problems					
TSC Proficiency Description	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
		AER-SYS-2010-1.1	AER-SYS-3010-1.1			
		Apply physics concepts in engineering applications	Apply physics concepts in engineering applications which include statics, kinetics, dynamics and fluid dynamics concepts			
Knowledge		<ul style="list-style-type: none"> Principles of nature of matter Concepts of mechanics Thermodynamics concepts Principles of optics (light) Concepts of wave motion and sound 	<ul style="list-style-type: none"> Principles of nature of matter Statics, kinetics, dynamics and fluid dynamics concepts Thermodynamics concepts Principles and application of optics (light) concepts Concepts wave motion and sound 			
Abilities		<ul style="list-style-type: none"> Assess the nature and mechanical properties of solids, liquids and gases Solve vector equations for velocity, acceleration and force vector calculations Perform energy, work and power calculations for bodies under applied force and material or structural stresses Analyse the kinematics of a rigid body for motion calculations Describe fluid pressures and their measurements using manometers Perform calculations for heat transfer principles including convection, radiation and conduction 	<ul style="list-style-type: none"> Evaluate the mechanical properties of solids, liquids and gases as a function of their structure and crystallographic quantities Solve vector equations for velocity, acceleration and force vector calculations Develop free body diagram for bodies under applied force, deformations and material or structural stresses Analyse the kinematics of a rigid body to predict linear, rotational, and periodic motion Apply Bernoulli's equation to solve fluid flow 			

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		<p>based on the three governing laws of thermodynamics</p> <ul style="list-style-type: none"> • Analyse the thermodynamic properties for ideal gases, water/steam and major refrigerant • Perform calculations involving latent heat, thermal energy, and heat of combustion • Explain and sketch the isothermal, adiabatic expansions and compression cycles • Apply principles of wave particle duality of light 	<p>problems for the determination of unknown variables</p> <ul style="list-style-type: none"> • Perform calculations for heat transfer principles including convection, radiation and conduction based on the three governing laws of thermodynamics • Evaluate the thermodynamic properties for ideal gases, water/steam and major refrigerant • Review calculations involving latent heat, thermal energy, and heat of combustion • Evaluate isothermal, adiabatic expansions and compression cycles to develop engine thermodynamic cycles • Evaluate the practical implications of wave particle duality of light 			
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