SKILLSFuture SG

SKILLS FRAMEWORK FOR AEROSPACE

SKILLS MAP - Design Engineer

Sector	Aerospace
Track	Manufacturing
Occupation	Engineer
Job Role	**Design Engineer**
Job Role Description	The Design Engineer is responsible for day-to-day designing and engineering activities. He/She is expected to be proficient in executing system design calculations and developing technical drawings and models using computer-aided software, in compliance with industry standards and international conventions. He also collaborates with stakeholders to resolve design and engineering gaps. He ensures adherence of manufacturing design operations to legislative and airworthiness requirements, as well as with the organisation's standard operating procedures (SOPs), quality and risk management systems. He identifies opportunities for continuous improvement and implements lean and sustainability practices in the workplace, while also contributing to research on market trends and technology applications for innovation and business insights. He is meticulous and detail-orientated. He possesses excellent mathematical, analytical and problem-solving skills. He is adaptable to changing customer requirements and is responsible to provide technical guidance to peers and junior team members.

Critical Work Functions and Key Tasks / Performance Expectations

Critical Work Functions	Key Tasks	Performance Expectations (For legislated / regulated occupations)*
Develop engineering designs	Execute system design calculations to ascertain technical specifications	In accordance with: • International Civil Aviation Organisation (ICAO) legislation • Air Navigation Order (ANO) • Singapore Airworthiness Requirements (SAR) • Relevant foreign aviation legislations • Workplace Safety and Health (WSH) Act • Environmental standards • Aerospace quality management system standards • ISO, AN, MS, NAS and MIL standards • Air Transport Association of America (ATA) standards • Special process standards *Performance Expectations are non-exhaustive and subject to prevailing regulations
	Develop design plan sketches based on customer requirements and engineering calculations	
	Create technical drawings using computer-aided design (CAD) techniques	
	Generate 3D models of prototype designs	
	Ensure compliance with industry standards and international conventions in drawings and models	
	Resolve design and engineering gaps with stakeholders	
Conform to management system requirements	Ensure adherence of manufacturing design operations to standard operating procedures (SOPs)	
	Ensure compliance with legislative requirements and airworthiness standards	
	Implement organisational quality and risk management systems	
	Adopt sustainability practices in manufacturing design	
Contribute to continuous improvement	Identify opportunities for continuous improvement projects	
	Implement lean practices in manufacturing design	
	Contribute to research on market trends and technology applications to drive innovation	
	Analyse data for identification of business insights	
Manage people and organisational development	Communicate with team members and customers to ensure smooth day-to-day operations	
	Monitor staff performance	
	Provide technical guidance to peers and junior team members	

Skills & Competencies

Technical Skills and Competencies		Generic Skills and Competencies	
Additive Manufacturing	Level 3	Problem Solving	Intermediate
Aerodynamics Principles Application	Level 3	Decision Making	Basic
Aerospace Materials and Hardware Selection	Level 3	Creative Thinking	Basic
Augmented Reality Application	Level 2	Sense-Making	Advanced
Aviation Legislation Compliance	Level 3	Teamwork	Advanced
Business Negotiation	Level 3		
Business Opportunities Development	Level 2		
Composite Structures Design and Maintenance	Level 3		
Computer-aided Design Application	Level 3		
Continuous Process Improvement	Level 3		
Digital Techniques Application	Level 3		
Electrical Fundamentals Application	Level 3		
Electronic Fundamentals Application	Level 3		
Engineering Problem Solving	Level 4		
Engineering Product Design Facilitation	Level 3		

Skills & Competencies	Gas Turbine Engine Principles Application	Level 3		
	Helicopter Aerodynamics, Structures and Systems Principles Application	Level 3		
	Human Factors Application and Error Management	Level 3		
	Internet of Things Implementation	Level 3		
	Knowledge Management	Level 3		
	Lean Manufacturing	Level 2		
	Mathematical Concepts Application	Level 3		
	Non-metallic Materials Manufacturing	Level 3		
	Physics Concepts Application	Level 3		
	Piston Aeroplane Aerodynamics, Structures and Systems Principles Application	Level 3		
	Piston Engine Principles Application	Level 3		
	Propeller Principles Application	Level 3		
	Propulsion Principles Application	Level 3		
	Quality System Management	Level 3		
	Robotics and Automation Application	Level 3		
	Turbine Aeroplane Aerodynamics, Structures and Systems Principles Application	Level 3		
	Workplace Safety and Health Framework Development and Implementation	Level 3		
Programme Listing	*For a list of training programmes available for the Aerospace sector, please visit <https://www.skillsfuture.sg/skills-framework/aero>*			

The information contained in this document serves as a guide.