

SKILLS FRAMEWORK FOR AEROSPACE			
SKILLS MAP - Manufacturing Engineer/Production Engineer (Manufacturing)			
Sector	Aerospace		
Track	Manufacturing		
Occupation	Industrial and Production Engineer		
Job Role	Manufacturing Engineer/Production Engineer (Manufacturing)		
Job Role Description	<p>The Manufacturing Engineer/Production Engineer (Manufacturing) develops detailed operation sheets throughout the manufacturing cycle, from receipt of materials to parts shipment using specification sheets. He/She coordinates shop floor operations and process control, and plans resources to meet production targets. He is conversant with tools and fixtures design, computer numerical control (CNC) programming and computer integrated manufacturing (CIM) technologies. He determines appropriate resources and processes for engineering application while ensuring working conditions of manufacturing equipment and machinery. He also verifies conformance of manufactured components and parts to specifications.</p> <p>He ensures adherence of manufacturing operations to legislative and airworthiness requirements, as well as with the organisation's standard operating procedures (SOPs), safety, health and quality systems. He identifies opportunities for continuous improvement through data analytics, research and innovation, and implements lean and sustainability practices in manufacturing. He monitors staff performance and is expected to provide technical guidance to technicians to meet production targets and product quality standards.</p>		
Critical Work Functions and Key Tasks / Performance Expectations	Critical Work Functions	Key Tasks	Performance Expectations (For legislated / regulated occupations)*
	Manage manufacturing and production planning	Develop detailed operation and specification sheets	<ul style="list-style-type: none"> In accordance with: <ul style="list-style-type: none"> 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 <p>*Performance Expectations are non-exhaustive and subject to prevailing regulations</p>
		Plan for manpower, materials and resources to meet production targets	
		Identify production process enhancements to improve cost efficiency, yield, quality and cycle times	
		Deploy computer integrated manufacturing (CIM) technologies	
		Coordinate shop floor operations and process control	
		Conduct negotiations with customers to reconcile product requirements with manufacturing parameters and business needs	
	Manufacture components and end products	Design tooling, jigs and fixtures for manufacturing	
		Determine appropriate materials, hardware and processes for engineering application	
		Manage advanced machining and computer-aided manufacturing (CAM) techniques	
		Produce and post-process the tool path data into machine specific codes for multi-axis computer numerical control (CNC) machining	
		Verify conformance of component or product dimensions and finishing to specifications	
		Verify working conditions of manufacturing equipment and machinery as per job requirements	
	Conform to management system requirements	Ensure documentation in accordance with regulatory and organisational requirements	
		Ensure adherence of manufacturing operations to standard operating procedures (SOPs)	
		Ensure compliance with legislative requirements and airworthiness standards	
		Enforce conformance to environment, safety and health systems, policies and procedures	
		Implement organisational quality and risk management systems	
	Contribute to continuous improvement	Implement sustainability practices for manufacturing	
		Identify opportunities for continuous improvement projects	
		Implement lean practices for manufacturing	
		Contribute to research on market trends and technology applications to drive innovation	
	Manage people and organisational development	Analyse data for identification of operational and business insights	
		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			
Technical Skills and Competencies		Generic Skills and Competencies	
Additive Manufacturing	Level 3	Problem Solving	Intermediate
Aerodynamics Principles Application	Level 3	Decision Making	Basic
Aerospace Heat Treatment Process	Level 3	Sense-Making	Advanced
Aerospace Materials and Hardware Selection	Level 3	Service Orientation	Intermediate
Augmented Reality Application	Level 2	Teamwork	Advanced
Automated System Design	Level 3		
Automation Process Control	Level 3		
Aviation Legislation Compliance	Level 3		

Skills & Competencies	Business Negotiation	Level 3		
	Business Opportunities Development	Level 2		
	Chemical Processing	Level 3		
	Coating	Level 3		
	Computer-aided Manufacturing	Level 3		
	Condition-based Assets Monitoring Management	Level 3		
	Continuous Process Improvement	Level 3		
	Cutting	Level 3		
	Digital Techniques Application	Level 3		
	Elastomer Seals Application	Level 3		
	Electrical Fundamentals Application	Level 3		
	Electronic Fundamentals Application	Level 3		
	Engineering Drawing Interpretation and Management	Level 3		
	Engineering Problem Solving	Level 4		
	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		
	Jigs and Fixtures Design	Level 3		
	Knowledge Management	Level 3		
	Laser and Optics Application	Level 4		
	Lean Manufacturing	Level 2		
	Machining	Level 3		
	Manufacturing Process Management	Level 3		
	Material Joining	Level 3		
	Mathematical Concepts Application	Level 3		
	Metallic Material Characterisation	Level 3		
	Non-metallic Materials Manufacturing	Level 3		
	Non-metallic Materials Testing	Level 3		
	Physics Concepts Application	Level 3		
	Piston Aeroplane Aerodynamics, Structures and Systems Principles Application	Level 3		
	Piston Engine Principles Application	Level 3		
	Product Lifecycle Management	Level 3		
	Production Line Set-up	Level 3		
	Propeller Principles Application	Level 3		
	Propulsion Principles Application	Level 3		
	Quality System Management	Level 3		
	Robotics and Automation Application	Level 3		
	Sealants Process	Level 3		
	Surface Enhancement	Level 3		
	Surface Preparation and Protection for Aerospace Manufacturing	Level 3		
	Turbine Aeroplane Aerodynamics, Structures and Systems Principles Application	Level 3		

	Welding Process	Level 3		
	Workplace Safety and Health Framework Development and Implementation	Level 3		
	Workshop Practices Application	Level 2		
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