COMPASS C5 Shortage Occupation List (SOL) Employer Guide

Released in November 2024 (applicable to new and renewal applications from 1 January 2025)

This guide is prepared to help applicants comply with the requirement that they perform the job duties as the declared shortage occupation so as to use the SOL bonus points to pass COMPASS, and/or qualify for the longer five-year duration EP for tech professionals.

How to use this guide

1. Your candidate must be performing the **key job duties** listed for the specific shortage occupation. If not, the candidate's role is not covered under the shortage occupation.
2. Applicants should select one of the **eligible job titles** in the EP application form. This must be the same as the occupation for the job advertisement in MyCareersFuture (MCF), unless you are exempted from the FCF job advertising requirement.
3. Your application must meet the **additional requirements** specific to the shortage occupation. This can include:
   a. Relevant qualifications, to be uploaded under the qualifications section of the EP application form
   b. Work experience in relevant job titles, to be selected under the work experience section in the EP application form
   c. Registration proof, to be uploaded in the agency support question in the EP application form
4. If you have any questions pertaining to the additional requirements for each shortage occupation, you may contact the supporting sector agency listed in this guide.

Details of the shortage occupations

S/N	Shortage occupation	Eligible job titles	Key job duties	Additional requirements	Supporting sector agency
Agritech					

1.	Alternative protein food application scientist	• Alternative protein food application scientist	• Conduct new product development to innovate new food products in the alternative protein space by leveraging processes such as fermentation, extrusion etc.
			
			• Other work related to:
			
			   o Functionalities and use of various raw materials like plant-based protein, flavours, fats and lipids for use in alternative food applications etc.
			   o Recipe formulation to optimise taste and texture of product.
			   o Consumer acceptance and sensory evaluation studies.
			
			• Food processing technologies.
				Applicants should meet both criteria (1) and (2):
				
				(1) Be from a firm involved in the Agritech space. MOM verifies this directly with EDB and Enterprise Singapore (EnterpriseSG), so no additional documentation is required. New entrants to the Agritech space can reach out to EDB/EnterpriseSG.
				
				(2) Either (2a) or (2b):
				
				(2a) At least a Bachelor's degree in any of these faculties:
				
				   o Bioengineering
				   o Biomedical Sciences
				   o Biomolecular Engineering
				   o Chemical Engineering
				   o Food Engineering
				   o Food Science
				   o Nutrition
				
				   OR
				
				   At least a Diploma in any of these faculties:
				
				   o Culinary Arts
				   o Culinary Sciences
				
				(2b) Minimum total three years' work experience in any of these job titles:
				
				   o Alternative protein food application scientist
				   o Chef
				   o Food and drink technologist
				   o Food processing engineer
				   o Food processing technician
				   o Food production technician
				   o Food science technician
				   o Research and development chef
					Economic Development Board (EDB)

2.	Novel food biotechnologist	• Novel food biotechnologist	• Develop bioprocess parameters and protocols for production of protein, lipids, or other nutrients from biotech processes such as fermentation, cell-culture. • Test and finetune bioprocess parameters to optimise yields, efficiency, and product quality of protein, lipids, or other nutrients from biotech processes such as fermentation, cell-culture.	Applicants should meet both criteria (1) and (2): (1) Be from a firm involved in the Agritech space. MOM verifies this directly with EDB and EnterpriseSG, so no additional documentation is required. New entrants to the Agritech space can reach out to EDB/EnterpriseSG. (2) Either (2a) or (2b): (2a) At least a Bachelor's degree in any of these faculties:	EDB

S/N	Shortage occupation	Eligible job titles	Key job duties	Additional requirements	Supporting sector agency
			• Conduct treatment of ingredients and products post-bioprocessing, including downstream processing steps such as purification, concentration, drying, with the intent of incorporating them into various food matrixes. • Conduct or validate laboratory analysis and findings on products to map out functionalities and results in order to optimise model of production • Develop new innovations in bioprocessing to improve product cost and quality	○ Bioengineering ○ Biomedical Sciences ○ Biomolecular Engineering ○ Chemical Engineering ○ Food Engineering ○ Food Science ○ Nutrition (2b) Minimum total three years' work experience in any of these job titles. ○ Bioprocess engineer ○ Food and drink technologist ○ Food processing engineer ○ Food processing technician ○ Food production manager ○ Food production technician ○ Food science technician ○ Manufacturing engineer ○ Novel food biotechnologist ○ Process engineer ○ Production engineer	
Financial services					
3.	Financial/ investment adviser (ultra-high/high net worth, family office & philanthropy)	• Investment advisor (ultra-high/high net worth / family office / philanthropy)	• Serve as strategic advisor on client's overall investment portfolio to drive holistic portfolio construction and asset allocation activities to provide tailored investment proposals, portfolio analysis, review and aftersales services to **ultra-high/high net worth or family office clients and relationship managers, including in emerging areas such as philanthropy**. • Understand and assess client's overall risk appetite, investment objectives and client suitability. • Educate sales force on product solutions.	Applicants should meet both criteria (1) and (2): (1) Employer is a Singapore licensed financial institution (FI) with private banking business. MOM verifies this directly with the Monetary Authority of Singapore (MAS), so no additional documentation is required. FIs can reach out to MAS for clarifications. (2) Minimum total three years' work experience in any of these job titles: ○ Investment advisor (ultra-high/ high net worth/ family office/ philanthropy).	Monetary Authority of Singapore (MAS)
		• Relationship manager (ultra-high/high net worth / family office / philanthropy)	• Develop keen understanding of **ultra-high/high net worth or family office** clients' holistic needs, and work with colleagues in investment products and solutions teams to develop and provide bespoked trusted advice and solutions to clients across successive generations and international borders, **including in emerging areas of client interest such as philanthropy**. • Build, establish and grow client relationship. • Take a strategic view of clients' investments and closely monitor their portfolio quality.	Applicants should meet both criteria (1) and (2): (1) Employer is a Singapore licensed FI with private banking business. MOM verifies this directly with MAS, so no additional documentation is required. FIs can reach out to MAS for clarifications. (2) Minimum total three years' work experience in any of these job titles: ○ Relationship manager (ultra-high/high net worth / family office / philanthropy).	MAS
		• Wealth planner (ultra-high/high net worth / family office / philanthropy)	• Develop bespoke solutions that may involve trust planning, tax and estate planning, family office solutions, and insurance-related needs, as well as emerging areas of client interest such as **philanthropy** for **ultra-high/high net worth or family office clients** across successive generations and international borders. • Apply understanding of political, tax and economic developments in specific countries to client situations whilst ensuring that	Applicants should meet both criteria (1) and (2): (1) Employer is a Singapore licensed FI with private banking business. MOM verifies this directly with MAS, so no additional documentation is required. FIs can reach out to MAS for clarifications. (2) Minimum total three years' work experience in any of these job titles: ○ Wealth planner (ultra-high/high net worth / family office / philanthropy).	MAS

S/N	Shortage occupation	Eligible job titles	Key job duties	Additional requirements	Supporting sector agency
			wealth planning business continues to meet the bank's general and wealth planning specific standards and policies. • Support relationship managers in client meetings, structuring, presentations and after-sales activities relating to asset ownership and asset transfer. • Provide wealth planning technical and application training to relationship managers.		
Green economy					
4.	Carbon project/program manager	• Carbon programme manager • Carbon project originator • Carbon project manager	• Combine technical and project management skills to develop carbon projects, ensure that they are successfully registered, and can issue carbon credits under the requirements of relevant crediting mechanisms. • Other work related to: ○ International regulations for carbon markets (e.g. Kyoto Protocol, Paris Agreement). ○ Application of carbon offset project standards and frameworks. ○ Technology-based and nature-based solutions for carbon credit. ○ Project development in the Asian/Southeast Asian context.	Applicants should meet both criteria (1) and (2): (1) Be from a firm involved in the Carbon Services space. MOM verifies this directly with EDB and EnterpriseSG, so no additional documentation is required. New entrants to the Carbon Services space can reach out to EDB/EnterpriseSG. (2) Either (2a) or (2b): (2a) At least a Bachelor's degree in any of these faculties: ○ Earth Sciences ○ Environmental Engineering ○ Environmental Management ○ Environmental Policy ○ Sustainability Management ○ Sustainability Policy (2b) Minimum total three years' work experience in at least one of these job titles: ○ Carbon auditor ○ Carbon programme manager ○ Carbon project manager ○ Carbon project originator ○ Carbon rating analyst ○ Carbon standards & methodology developer ○ Carbon verification & audit specialist ○ Chief sustainability officer ○ Conservation officer ○ Conservation scientist ○ Energy and sustainability manager ○ Environmental auditor ○ Environmental compliance officer ○ Environmental impact analyst ○ Environmental management consultant ○ Environmental officer (environmental protection) ○ Environmental programme coordinator ○ Natural resource analyst ○ Sustainability officer ○ Sustainability specialist	EDB
5.	Carbon standards and methodology analyst	• Carbon rating analyst • Carbon standards & methodology developer	• Develop appropriate frameworks that can be used to credibly assess carbon projects. Examples of standards include those published by international organisations such as The Gold Standard and Verified Carbon Standard, which cover a broad range of carbon offset projects from nature-based solutions (e.g. mangrove planting, afforestry, deforestation prevention) to technology solutions (e.g. renewable energy, biogas, high-efficiency cookstoves).	Applicants should meet both criteria (1) and (2): (1) Be from a firm involved in the Carbon Services space. MOM verifies this directly with EDB and EnterpriseSG, so no additional documentation is required. New entrants to the Carbon Services space can reach out to EDB/EnterpriseSG. (2) Either (2a) or (2b): (2a) At least a Bachelor's degree in any of these faculties: ○ Earth Sciences	EDB

S/N	Shortage occupation	Eligible job titles	Key job duties	Additional requirements	Supporting sector agency
			• Create robust templates and procedures for project developers to follow in order for the project to issue carbon credits. • Update rules and procedures as climate issues evolve. • Other work related to: o International regulations for carbon markets (e.g. Kyoto Protocol, Paris Agreement) o Technology-based and nature-based solutions for carbon credits o Application of carbon offset project standards and frameworks o Project development in the Asian/Southeast Asian context	o Environmental Engineering o Environmental Management o Environmental Policy o Sustainability Management o Sustainability Policy (2b) Minimum total three years' work experience in at least one of these job titles: o Carbon auditor o Carbon programme manager o Carbon project manager o Carbon project originator o Carbon rating analyst o Carbon standards & methodology developer o Carbon verification & audit specialist o Chief sustainability officer o Conservation officer o Conservation scientist o Energy and sustainability manager o Environmental auditor o Environmental compliance officer o Environmental impact analyst o Environmental management consultant o Environmental officer (environmental protection) o Environmental programme coordinator o Natural resource analyst o Sustainability officer o Sustainability specialist	
6.	Carbon trader	• Carbon trader	• Trade/ broker carbon credits. • Originate and structure carbon credit deals. • Facilitate transactions between buyers and sellers of carbon credits. • Perform carbon market research and analysis on: o Different types of carbon credits and their attributes (e.g. project type, region, co-benefits, crediting mechanism). o Quality of carbon credits (e.g. Core Carbon Principles and Assessment Framework). o Factors that affect price dynamics in over-the-counter markets or exchanges. o International regulations and policies regarding carbon markets (e.g. Paris Agreement Article 6), as well as global and national compliance schemes and its evolving regulations (e.g. Australia, China, European Union Emissions Trading System).	Applicants must minimally meet both criteria (1) and (2): (1) Minimum total three years' work experience in carbon markets or carbon credit-related fields. (2) At least a degree-equivalent qualification (i.e. score 10 points on COMPASS Criterion 2). EnterpriseSG will assess all applications that meet these criteria and may contact employers for a business profile, including details on their carbon trading business.	EnterpriseSG
7.	Carbon verification and audit specialist	• Carbon auditor • Carbon verification & audit specialist	• Assess whether carbon project issuing carbon credits meet the regulatory requirements. • Undertake field visits, or deploy technological solutions such as geospatial imaging/satellite data that determine whether the data reported by project developers correspond to actual emission reductions.	Applicants should meet both criteria: (1) Be from a firm involved in the Carbon Services space. MOM verifies this directly with EDB and EnterpriseSG, so no additional documentation is required. New entrants to the Carbon Services space can reach out to EDB/EnterpriseSG. (2) Either (2a) or (2b): (2a) At least a Bachelor's degree in any of these faculties:	EDB

S/N	Shortage occupation	Eligible job titles	Key job duties	Additional requirements	Supporting sector agency
			• Apply international and local regulations relating to greenhouse gas emissions. • Use impact indicators for measurement and reporting purposes. • Apply knowledge of climate governance issues. • Use specific technologies (e.g. Geographic Information System data, sensors) used to verify emissions data submitted by project developers.	o Earth Sciences o Environmental Engineering o Environmental Management o Environmental Policy o Sustainability Management o Sustainability Policy (2b) Minimum total three years' work experience in at least one of these job titles: o Carbon auditor o Carbon programme manager o Carbon project manager o Carbon project originator o Carbon rating analyst o Carbon standards & methodology developer o Carbon verification & audit specialist o Chief sustainability officer o Conservation officer o Conservation scientist o Energy and sustainability manager o Environmental auditor o Environmental compliance officer o Environmental impact analyst o Environmental management consultant o Environmental officer (environmental protection) o Environmental programme coordinator o Natural resource analyst o Sustainability officer o Sustainability specialist	
Healthcare					
8.	Clinical psychologist	• Clinical psychologist	• Assess mental health and social needs, formulate care and deliver a range of psychological therapies including Cognitive Behavioural Therapy across the age range and across hospital and community settings. • More details on the job duties can be found on the Ministry of Health's (MOH) Care to Go Beyond website: https://www.caretogobeyond.sg/ahp/highlights/care-gallery/webisodes/clinical-psychologist	Applicants should have at least a Master's degree in Clinical Psychology. MOH will assess all applications and may contact employers for more information.	Ministry of Health (MOH)
9.	Diagnostic radiographer	• Diagnostic radiographer • Magnetic resonance imaging technologist • Mammographer • Medical diagnostic radiographer • Radiologic technologist	• Plan, prepare and perform diagnostic imaging examinations and post processing, with a wide range of equipment and techniques using X-rays, strong magnetic fields or Magnetic Resonance Imaging (MRI) and high frequency sound (ultrasound). • More details on the job duties can be found on AHPC's website: • https://www.healthprofessionals.gov.sg/ahpc/about-the-professions/diagnostic-radiography	Applicants should be registered with MOH's Allied Health Professional Council.	MOH
10.	Occupational therapist	• Ergotherapist • Occupational therapist • Occupational therapist manager • Occupational therapist researcher	• Help individuals with physical, cognitive, developmental, social or emotional conditions to improve their basic functions and abilities, so they can reintegrate with society, and return to work, school, or daily life. • More details on the job duties can be found on AHPC's website:	Applicants should be registered with MOH's Allied Health Professional Council.	MOH

S/N	Shortage occupation	Eligible job titles	Key job duties	Additional requirements	Supporting sector agency
			• https://www.healthprofessionals.gov.sg/ahpc/about-the-professions/occupational-therapy		
11.	Physiotherapist	• Aquatic physiotherapist • Clinical physiotherapist • Physical therapist • Physiotherapist • Physiotherapist manager • Physiotherapist researcher • Sports physiotherapist • Sports physical therapist	• Assess, plan and implement rehabilitative programmes that improve or restore human motor functions, maximise movement ability, relieve pain syndromes, and treat or prevent physical challenges associated with injuries, diseases and other impairments • Apply a broad range of physical therapies and techniques such as exercises, manual techniques, electrical physical agents, technology, aids and appliances and other techniques. • More details on the job duties can be found on Allied Health Professional Council website: https://www.healthprofessionals.gov.sg/ahpc/about-the-professions/physiotherapy	Applicants should be registered with MOH's Allied Health Professional Council.	MOH
12.	Registered nurse	• Assistant director of nursing • Assistant nurse clinician • Chief nurse • Clinic nurse • Clinical nurse • Deputy director of nursing • Director of nursing • Emergency nurse • Industrial nurse • Maternity nurse • Nurse anaesthetist • Nurse clinician • Nurse educator • Nurse manager • Nurse midwife • Matron (nursing) • Obstetrics nurse • Occupational health nurse • Orthopaedic nurse • Paediatric nurse • Perioperative nurse • Professional nurse • Psychiatric nurse • Public health nurse • Registered nurse • School nurse • Sister (nursing) • Staff nurse	• Use evidence-based nursing knowledge and professional nursing judgement to assess health needs, provide nursing care, educate clients and support individuals to manage their health holistically. • Practice in collaboration with other healthcare professionals and may practise in a variety of clinical contexts depending on their education preparation and practice experience. • More details on the job duties can be found on the Singapore Nursing Board website: https://www.healthprofessionals.gov.sg/snb/guidelines-and-standards	Applicants should be registered with MOH's Singapore Nursing Board.	MOH
Infocomm technology					

13.	Artificial intelligence (AI) scientist/ engineer	• AI engineer	• Support the production of scalable and optimised AI/machine learning (ML) models
			
			• Focus on building algorithms for the extraction, transformation and loading of large volumes of real-time, unstructured data to deploy AI/ML solutions from theoretical data science models.
			
			• Run experiments to test the performance of deployed models,
				Applicants should have either (1a) or (1b):
				
				(1a) At least a Bachelor's degree in any of these faculties:
				
				    o Computer Science
				    o Information Technology
				    o Programming & Systems Analysis
				    o Science (Computer Studies)
				
				(1b) Minimum total three years' work experience in at least one of these job titles:
				
				    o AI engineer
					Infocomm Media Development Authority (IMDA)

S/N	Shortage occupation	Eligible job titles	Key job duties	Additional requirements	Supporting sector agency
			and identifies and resolves bugs that arise in the process. • Work in a team setting and apply knowledge in statistics, scripting and programming languages required by the firm. • Work with the relevant software platforms in which the models are deployed.		

		• AI researcher/ scientist	• Plan and lead the development of new and advanced data analytic techniques, methodologies and analytical solutions from design, prototyping, and testing.
			
			• Identify and develop core data and AI science components for the delivery of projects, architect specialised database and computing environments, explore and visualise complex data set to provide incremental business value.
			
			• Extract and integrate data from various sources, and create advanced models and algorithms suitable for the business use case.
			
			• Conduct testing on data and AI models, interprets findings from testing, and evaluates model performance for scaling and deployment.
			
			• Work in a team setting and apply proficient in statistics, scripting and programming languages required by the firm.
			
			• Work with relevant software platforms on which the solution is deployed.
				Applicants should have either (1a) or (1b):
				
				(1a) At least a Bachelor's degree in any of these faculties:
				
				  o Computer Science
				  o Information Technology
				  o Programming & Systems Analysis
				  o Science (Computer Studies)
				
				(1b) Minimum total three years' work experience in at least one of these job titles:
				
				  o AI researcher/scientist
					IMDA

14.	Applications/ systems programmer	• Analyst programmer
		• Applications programmer
		• Computer programmer
		• Multimedia programmer
		• Systems programmer
		• Technical programmer
			• Write and maintain programmable code outlined in technical instructions and specifications for software applications and operating systems.	Applicants should have either (1a) or (1b):
				
				(1a) At least a Bachelor's degree in any of these faculties:
				
				  o Computer Science
				  o Information Technology
				  o Programming & Systems Analysis
				  o Science (Computer Studies)
				
				(1b) Minimum total three years' work experience in at least one of these job titles:
				
				  o Analyst programmer
				  o Applications programmer
				  o Computer programmer
				  o Multimedia programmer
				  o Systems programmer
				  o Technical programmer
					IMDA

15.	Cloud specialist	• Cloud architect
		• Cloud engineer
		• Cloud operations engineer
		• Cloud specialist
			• Deploy and configure solutions in the cloud.
			
			• Automate cloud operations, develop infrastructure automation scripts and participates in the continuous improvement of cloud solutions.
			
			• Participate in the specification, setup and run Proof of Concepts and demonstrations of cloud solutions.
				Applicants should have either (1a) or (1b):
				
				(1a) At least a Bachelor's degree in any of these faculties:
				
				  o Computer Science
				  o Information Technology
				  o Programming & Systems Analysis
				  o Science (Computer Studies)
				
				(1b) Minimum total three years' work experience in at least one of these job titles:
					IMDA

S/N	Shortage occupation	Eligible job titles	Key job duties	Additional requirements	Supporting sector agency
			• Administer and maintain servers across virtual platforms.	○ Cloud architect ○ Cloud engineer ○ Cloud operations engineer ○ Cloud specialist	
16.	Cyber risk specialist	• Cyber compliance specialist • Cyber governance specialist • Cyber risk analyst • Cyber risk manager • Cyber threat monitoring analyst • Cyber security consultant • ICT resilience analyst • ICT resilience manager • ICT security consultant • ICT security specialist • Information security analyst • Information technology security specialist	• Conduct cyber risk assessment in support of technology initiatives to help identify IT related risk and determine appropriate controls to mitigate risks. • Monitor, track, and manage risk mitigations and exceptions and ensure adequate monitoring capability is incorporated into solutions.	Applicants should have either (1a) or (1b): (1a) At least a Bachelor's degree in any of these faculties: ○ Computer Science ○ Information Technology ○ Programming & Systems Analysis ○ Science (Computer Studies) (1b) Minimum total three years' work experience in at least one of these job titles: ○ Cyber compliance specialist ○ Cyber governance specialist ○ Cyber risk analyst ○ Cyber risk manager ○ Cyber threat monitoring analyst ○ Cyber security consultant ○ ICT resilience analyst ○ ICT resilience manager ○ ICT security consultant ○ ICT security specialist ○ Information security analyst ○ Information technology security specialist	IMDA
17.	Cybersecurity architect	• Cybersecurity architect • Cybersecurity engineer • ICT security engineer • ICT security architect • Information systems security developer	• Design, develop, and implement secure system architectures. • Embed security principles into the design of system architectures to mitigate the risks posed by new technologies and business practices. • Design artefacts, spanning design, development, and implementation, into enterprise systems that describe security principles and how they relate to the overall enterprise system architecture. • Perform routine activities related to the periodic review and audit activities of infrastructure security systems and maintains documentation of security standards and procedures.	Applicants should have either (1a) or (1b): (1a) At least a Bachelor's degree in any of these faculties: ○ Computer Science ○ Information Technology ○ Programming & Systems Analysis ○ Science (Computer Studies) (1b) Minimum total three years' work experience in at least one of these job titles: ○ Cybersecurity architect ○ Cybersecurity engineer ○ ICT security engineer ○ ICT security architect ○ Information systems security developer	IMDA
18.	Cybersecurity operations specialist	• Cyber defense incident responder • Cyber incident responder • ICT security operations analyst • ICT threat monitoring analyst	• Perform real-time analysis and trending of security log data from various security devices and systems. • Maintain data sources feeding the log monitoring system, develop and maintain detection and alerting rules. • Respond to user incident reports and evaluates the type and severity of security events. • Execute initial triage of incidents to rule out false positives. • Identify recurring security issues and risks and develops mitigation plans and recommends process improvements.	Applicants should have either (1a) or (1b): (1a) At least a Bachelor's degree in any of these faculties: ○ Computer Science ○ Information Technology ○ Programming & Systems Analysis ○ Science (Computer Studies) (1b) Minimum total three years' work experience in at least one of these job titles: ○ Cyber defense incident responder ○ Cyber incident responder ○ ICT security operations analyst ○ ICT threat monitoring analyst	IMDA

S/N	Shortage occupation	Eligible job titles	Key job duties	Additional requirements	Supporting sector agency
			• Interpret and apply security policies and procedures. • Establish escalation processes for security incidents and develops contingency plans and disaster recovery procedures.		
19.	Data scientist	• Chief data scientist • Data engineer • Data scientist • Head of data analytics	• Develop and implement techniques and analytics applications to transform raw data into meaningful information using data-oriented programming languages and visualisation software. • Apply data mining, data modelling, natural language processing, and machine learning to extract and analyse information from large structured and unstructured datasets. • Visualise, interpret, and report data findings and may create dynamic data reports as well.	Applicants should have either (1a) or (1b): (1a) At least a Bachelor's degree in any of these faculties: o Computer Science o Information Technology o Programming & Systems Analysis o Science (Computer Studies) (1b) Minimum total three years' work experience in at least one of these job titles: o Chief data scientist o Data engineer o Data scientist o Head of data analytics	IMDA
20.	Digital forensics specialist	• Computer forensics expert • Computer forensics investigator • Cyber forensics expert • Cyber forensics investigation specialist • Cyber incident investigation specialist • Cyber threat investigation specialist • Digital forensic expert • Digital forensics analyst • ICT forensics expert • Information forensics expert	• Conduct complex post-incident forensic analysis to investigate causes of intrusion, attack, loss, or breach occurring in an organisation. • Identify and define forensic issues and root causes. • Develop reports that detail incident timeline, evidence, findings, conclusions and recommendations. • Support the design of a breach notification process after a security incident to minimise damage and downtime when attacks and exploits occur. • Select, test, and deploy security products and collect information about Internet-based criminal activities. • Recommend corrective actions to prevent and mitigate internal control failures.	Applicants should have either (1a) or (1b): (1a) At least a Bachelor's degree in any of these faculties: o Computer Science o Information Technology o Programming & Systems Analysis o Science (Computer Studies) (1b) Minimum total three years' work experience in at least one of these job titles: o Computer forensics expert o Computer forensics investigator o Cyber forensics expert o Cyber forensics investigation specialist o Cyber incident investigation specialist o Cyber threat investigation specialist o Digital forensic expert o Digital forensics analyst o ICT forensics expert o Information forensics expert	IMDA
21.	Penetration testing specialist	• Ethical hacker • Exploitation analyst • ICT security tester • Network security tester • Penetration testing specialist • Security penetration tester • Security penetration testing manager • System security tester • Vulnerability analyst	• Design and perform tests and check cases to determine if infrastructure components, systems and applications meet confidentiality, integrity, authentication, availability, authorisation, and non-repudiation standards. • Translate requirements into test plan, write and execute test scripts or codes in line with standards and procedures to determine vulnerability to attacks. • Certify infrastructure components, systems and applications that meet security standards.	Applicants should have either (1a) or (1b): (1a) At least a Bachelor's degree in any of these faculties: o Computer Science o Information Technology o Programming & Systems Analysis o Science (Computer Studies) (1b) Minimum total three years' work experience in at least one of these job titles: o Ethical hacker o Exploitation analyst o ICT security tester o Network security tester o Penetration testing specialist o Security penetration tester o Security penetration testing manager o System security tester o Vulnerability analyst	IMDA

S/N	Shortage occupation	Eligible job titles	Key job duties	Additional requirements	Supporting sector agency
22.	Product manager (digital)	• Digital product manager	• Manage the entire product line life cycle, from strategic planning to tactical activities. • Support product positioning and customer demand, and guide product development from conception to launch. • Evaluate product functionalities and performance and propose enhancements to products based on market feedback. • Research and analyse potential partner relationships for the product and generate ideas to grow market share, improve customer experience and drive growth. • Drive market research studies to explore new technology and oversee development of business proposals for new opportunities.	Applicants should have either (1a) or (1b): (1a) At least a Bachelor's degree in any of these faculties: o Computer Science o Information Technology o Programming & Systems Analysis o Science (Computer Studies) (1b) Minimum total three years' work experience in at least one of these job titles: o Digital product manager.	IMDA
23.	Software and applications manager (technical lead/ supervisor)	• Application development manager • Head of applications development • Software and applications manager • Software development manager	• Oversee the acquisition and development of software systems in organisational units. • Monitor the results and quality of the different software solutions and projects implemented in the organisation. • Oversee the development of Proof-of-Concept/ solutions and provide technical expertise on the development of software and platform features, ensuring that appropriate security and risk factors are considered.	Applicants should have either (1a) or (1b): (1a) At least a Bachelor's degree in any of these faculties: o Computer Science o Information Technology o Programming & Systems Analysis o Science (Computer Studies) (1b) Minimum total three years' work experience in at least one of these job titles: o Application development manager o Head of applications development o Software and applications manager o Software development manager	IMDA
24.	Software developer	• Applications developer • Blockchain architect • Blockchain developer • Blockchain engineer • Computer software engineer • Cryptography architect • Cryptography developer • Cryptography engineer • Platform engineer • Platform engineering manager • Programmers and software development professional • Software developer • Software engineer	• Research, design, and develop computer and network software or specialised utility programs. • Analyse user needs and develop software solutions, applying principles and techniques of computer science, engineering, and mathematical analysis. • Update software, enhances existing software capabilities, and develops and direct software testing and validation procedures. • Work with computer hardware engineers to integrate hardware and software systems and develop specifications and performance requirements.	Applicants should have either (1a) or (1b): (1a) At least a Bachelor's degree in any of these faculties: o Computer Science o Information Technology o Programming & Systems Analysis o Science (Computer Studies) o Software Engineering (1b) Minimum total three years' work experience in at least one of these job titles: o Applications developer o Blockchain architect o Blockchain developer o Blockchain engineer o Computer software engineer o Cryptography architect o Cryptography developer o Cryptography engineer o Platform engineer o Platform engineering manager o Programmers and software development professional o Software developer o Software engineer o Software development engineer	IMDA
		•	•		
25.	Web and mobile applications developer	• Mobile applications developer • Web developer	• Research, analyse and evaluate requirements for existing or new web and mobile applications. • Design, develop, test and maintain web and mobile	Applicants should have either (1a) or (1b): (1a) At least a Bachelor's degree in any of these faculties: o Computer Science	IMDA

S/N	Shortage occupation	Eligible job titles	Key job duties	Additional requirements	Supporting sector agency
			solutions to meet the requirements. • Evaluate programming codes to ensure that they are properly structured, meet industry standards and are compatible with browsers and devices. • Develop website infrastructure and integrate websites with other computer applications.	o Information Technology o Programming & Systems Analysis o Science (Computer Studies) (1b) Minimum total three years' work experience in at least one of these job titles: o Mobile applications developer o Web developer	
Maritime					
26.	Marine superintendent	• Marine superintendent (deck) • Marine superintendent	• Direct or arrange on-shore services such as supply of ships' stores and equipment, ship inspections and overhauls, crew replacements and navigational information for shipping company vessels arriving in port. • Order ship's stores, deck and navigation equipment and fuel, for delivery according to ship master's requirements and arranges for inspections, tests and overhauls as required by regulations or company practices.	Applicants should have at least a Level 1 Certificate of Competency from Singapore's Maritime Port Authority (MPA) or any of these 69 maritime administrations, which should be declared as a post-secondary diploma in the EP application form.	Maritime and Port Authority of Singapore (MPA)
27.	Marine technical superintendent	• Marine/vessel manager • Marine superintendent (engineer) • Technical superintendent (marine)	• Oversee the technical/ engineering functions of the fleet. • Plan, control and execute all activities connected with maintenance, repairs, survey and certificate requirements, dry-docking, conversion or modification of assigned vessels in addition to monitoring and controlling costs of repairs and maintenance while ensuring that all vessels comply with factory, class or charterer requirements.	Applicants should have at least a Level 1 Certificate of Competency from Singapore's Maritime Port Authority or any of these 69 maritime administrations, which should be declared as a post-secondary diploma in the EP application form.	MPA
Semiconductor					
28.	Semiconductor engineer	• Semiconductor engineer • Integrated circuit designer • Microchip engineer • Product engineer • Test engineer	• Design and develop the layout for integrated circuits according to electronics engineering principles, using software to create design schematics and diagrams. • Manage manufacturing process of the products, including technology yield and performance of the products. • Develop test programmes and procedures to ensure the products meet their performance specifications. • Provide advice on aspects of semiconductor process technology and maintain and repair semiconductor process equipment.	Applicants should meet both criteria (1) and (2): (1) Be from a firm involved in the Semiconductor space. MOM verifies this directly with EDB, so no additional documentation is required. New entrants to the Semiconductor space can reach out to EDB. (2) At least a Bachelor's Degree in an engineering/science faculty, inclusive of, and not limited to: • Electrical Engineering • Mechanical Engineering • Chemical Engineering • Materials Engineering • Material Sciences	EDB
29.	Instrumentation engineer	• Instrumentation and control (IC) engineer	• Designs and develops apparatus, procedures, equipment and systems used for controlling and monitoring manufacturing systems, machinery uses and production processes. • Oversees the installation, calibration, commissioning and	Applicants should meet both criteria (1) and (2): (1) Be from a firm involved in the Semiconductor space. MOM verifies this directly with EDB, so no additional documentation is required. New entrants to the Semiconductor space can reach out to EDB.	EDB

S/N	Shortage occupation	Eligible job titles	Key job duties	Additional requirements	Supporting sector agency
			maintenance of these equipment and instruments and ensures compliance with relevant health and safety regulations and quality standards to support continuous manufacturing activities.	(2) At least a Bachelor's Degree in an engineering/science faculty, inclusive of, and not limited to qualifications relating to: • Electrical engineering	
30.	Process engineer	• Process engineer • Process technology engineer • Process engineer (electronic)	• Applies engineering principles and techniques to optimise the production processes in a manufacturing environment to meet organisational objectives. • Analyses and troubleshoots process engineering, manufacturing and/or maintenance issues and recommends engineering solutions, and develops work instructions for 'out of control' processes. • Leads production and manufacturing systems improvement projects, and develops operation plans in accordance with organisational objectives and other regulatory requirements.	Applicants should meet both criteria (1) and (2): (1) Be from a firm involved in the Semiconductor space. MOM verifies this directly with EDB, so no additional documentation is required. New entrants to the Semiconductor space can reach out to EDB. (2) At least a Bachelor's Degree in an engineering/science faculty, inclusive of, and not limited to: • Electrical Engineering • Mechanical Engineering • Chemical Engineering • Materials Engineering • Material Sciences	EDB