



Certificate

**CURRICULUM COMPLIANCE TO
QUALIFICATION PACK – NATIONAL OCCUPATIONAL STANDARDS**
is hereby issued by the

AEROSPACE & AVIATION SECTOR SKILL COUNCIL (AASCC)

for the

MODEL CURRICULUM

Complying to National Occupational Standards of

Job Role/Qualification Pack : **'Design Engineer Avionics/Electrical systems'** QP No. **'AAS/Q3102' NSQF level 6'**

Date of issuance : 22 December 2017
Valid up to : 21 December 2018
* Valid up to the next review date of the Qualification Pack



(Authorised signatory)
Aerospace & Aviation Sector Skill Council (AASCC)

TABLE OF CONTENTS

1. Curriculum	1
2. Trainer Prerequisites	6
3. Annexure: Assessment Criteria	7

Design Engineer Avionics/Electrical Systems

CURRICULUM / SYLLABUS

This program is aimed at training candidates for the job of a “Design Engineer Avionics/Electrical Systems”, in the “Aerospace and Aviation” Sector/Industry and aims at building the following key competencies amongst the learner

Program Name	Design Engineer Avionics/Electrical Systems		
Qualification Pack Name & Reference ID.	AAS/Q3102		
Version No.	1.0	Version Update Date	24 – 08 - 2017
Pre-requisites to Training	Degree in Electrical / Electronic / Avionics and allied engineering branches and equivalent qualification		
Training Outcomes	<p>After completing this programme, participants will be able to</p> <ul style="list-style-type: none"> • Carry out research by <ul style="list-style-type: none"> • testing • analysing and • optimizing the Avionics/Electrical systems in a responsible manner. • Develop good communication and interpersonal skills • Work well in a team. 		

This course encompasses 6 out of 6 National Occupational Standards (NOS) of “Design Engineer Avionics/Electrical Systems” Qualification Pack issued by “Aerospace and Aviation Sector Skill Council (AASCC)”.

Sr. No.	Module	Key Learning Outcomes	Equipment Required
1	<p>Maintain organisational safety and information security Theory Duration (hh:mm) 24:00 Practical Duration (hh:mm) 24:00 Corresponding NOS Code AAS/N3201</p>	<p>Candidates will be able to;</p> <ul style="list-style-type: none"> • comply with your organisation’s IT policies and procedures for safety of data and information • adhere to the organisation’s policies pertaining to accesses granted, usage, modification of any information or recording or destruction of information • report any identified breaches of data or information in any form to the authority as described by the organization • report any theft of intellectual property according to the organisation policy • record, control the document version and take appropriate approvals for the documents, plans or drawings according to organisational hierarchy • follow your organisation’s safety procedures at workplace and act promptly, calmly, and efficiently in case of disruption • recommend improvement related to safety and security at the workplace • comply to any health and safety requirements set by an organisation 	<p>White/Black board/ Chart paper, Markers/Computer and projector, trainer’s guide, student handbook, Charts regarding health & hygiene</p>
2	<p>Create documents for knowledge sharing Theory Duration (hh:mm) 12:00 Practical Duration (hh:mm) 36:00 Corresponding NOS Code SSC/N0703</p>	<p>Candidates will be able to;</p> <ul style="list-style-type: none"> • establish with appropriate people the purpose, scope, formats and target audience for the documents • access existing documents, language standards, templates and documentation tools from your organization’s knowledge base • liaise with appropriate people to obtain and verify the information required for the documents • confirm the content and structure of the documents with appropriate people • create documents using standard templates and agreed language standards • review documents with appropriate people and incorporate their inputs • submit documents for approval by appropriate people • publish documents in agreed formats • update your organization’s knowledge base with the documents 	<p>White/Black board/ Chart paper, Markers/Computer and projector, trainer’s guide, student handbook,</p>

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		<ul style="list-style-type: none"> comply with your organization's policies, procedures and guidelines when creating documents for knowledge sharing 	
3	<p>Create, maintain and design avionics systems. Theory Duration (hh:mm) 58:00 Practical Duration (hh:mm) 91:00 Corresponding NOS Code AAS/N3102</p>	<ul style="list-style-type: none"> perform conceptual and detailed avionics system design and analysis as required for variety of airborne platforms with inputs from ARP 5761 and ARP 4754. develop functional algorithms for avionics systems/LRUs and allied systems develop PVI/MMI specifications and associated logics perform modelling & simulation studies and analysis source/realize the avionics LRUs/development environment/testing environment perform software development and software engineering process as per DO 178C for development of avionics systems/on-board computers & ground integration rigs / test equipment perform hardware development and hardware engineering process as per DO 254 as applicable for Complex electronics only for development of avionics systems/on-board computers & ground integration rigs / test equipment perform software-software integration, hardware-software integration, static/dynamic testing, simulator testing, and hardware-in-loop system testing. perform system Integration of Avionics System on rig/simulator/aircraft perform System Qualification as per DO 160G take up technology development/futuristic projects 	White/Black board/ Chart paper, Markers/Computer and projector, trainer's guide, student handbook
4	<p>Create, maintain and design electrical systems. Theory Duration (hh:mm) 54:00 Practical Duration (hh:mm) 95:00 Corresponding NOS Code AAS/N3112</p>	<ul style="list-style-type: none"> perform conceptual and detailed electrical system design and analysis as required for variety of airborne platforms design power conversion system, circuit designs and power systems design develop circuit and wiring diagrams, block diagrams, schematics, electrical cabling/routing, installation, assembly of panels and subassemblies and system design/modification 	White/Black board/ Chart paper, Markers/Computer and projector, trainer's guide, student handbook

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		<ul style="list-style-type: none"> select the appropriate equipment and drawing software to use, based on the type and complexity of the drawing functions to be carried out use current British, European, International and company standards to produce a drawing template for a range of paper sizes, and include the drawing title, scale used, date of drawing and other relevant information produce fully detailed drawings, to enable the electrical circuits to be assembled, installed, maintained, commissioned or modified 	
5	<p>Ensure systems engineering approach to design. Theory Duration (hh:mm) 60:00 Practical Duration (hh:mm) 90:00 Corresponding NOS Code AAS/N3113</p>	<ul style="list-style-type: none"> interact with various stakeholders at various stage to capture the functional requirements, operational concepts, certification requirements, and arrive at an optimal solution with adequate design reviews at various stages and risk mitigations ensuring that a systems engineering approach (or equivalent) to capability prototype and development is employed perform physical testing of harness and support other engineers to install and test prototypes develop the required design artefacts in support of capability introduction developing the required design artefacts in support of system substantiations develop required design artefacts in support of electrical load analysis, wiring diagrams, engineering drawings, etc. assist with development and delivery of the prototype deliverables for new capabilities, including but not limited to: Detailed Product Description (DPD), Design Specification Package (DSP), Drawings, Test Order and Test Report perform prototype harnessing assemblies and drive to closure, all systems integration trades related to those assemblies. obtain approvals from appropriate design authority. approve items for purchase such as harness, panels, sensors, LRUs, circuit boards, harness mounts, testing & measurement equipments, software tools etc. post offers from different suppliers and release installation drawings as per approved plan 	<p>White/Black board/ Chart paper, Markers/Computer and projector, trainer's guide, student handbook</p>

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		<ul style="list-style-type: none"> analysis on reliability, failure modes, impact of failures, criticality, redundancy, and maintainability aspects. conform to configuration management and change control procedures and policies. 	
6	<p>Work Effectively in a Team Theory Duration (hh:mm) 14:00 Practical Duration (hh:mm) 18:00 Corresponding NOS Code AAS /N0503</p>	<p>Candidates will be able to;</p> <ul style="list-style-type: none"> display courteous and helpful behaviour at all times take opportunities to enhance the level of assistance offered to colleagues meet all reasonable requests for assistance within acceptable workplace timeframes complete allocated tasks as assigned seek assistance when difficulties arise use questioning techniques to clarify instructions or responsibilities, identify and display a non discriminatory attitude in all contacts with customers and other staff members observe appropriate dress code and presentation as required by the workplace, job role and level of customer contact follow personal hygiene procedures according to organisational policy interpret, confirm and act on workplace information, instructions and procedures relevant to the particular task interpret, confirm and act on legal requirements with regards to anti-discrimination, sexual harassment and bullying ask questions to seek and clarify workplace information plan and organise daily work routine within the scope of the job role prioritise and complete tasks according to required timeframes identify work and personal priorities and achieve a balance between competing priorities 	<p>White/Black board/ Chart paper, Markers/Computer and projector, trainer's guide, student handbook</p>
	<p>Total Duration Theory Duration (hh:mm) 222:00 Practical Duration hh:mm) 354:00</p>	<p>Unique equipment used;</p> <ul style="list-style-type: none"> 2D/3D CAD software Relevant cross sectional/working models Aircraft Navigation and Communication model Basic Avionics Kit Form board drawing kit 	

Grand Total Course Duration: 576 Hours, 0 Minutes

(This syllabus/ curriculum has been approved by Aerospace and Aviation Sector Skill Council)

Trainer Prerequisites for Job role: “Design Engineer Avionics/Electrical Systems” mapped to Qualification Pack: “AAS/Q3102 ”

Sl. No.	Area	Details
1	Description	To deliver accredited training service, mapping to the curriculum detailed above, in accordance with the Qualification Pack “AAS/Q3102”.
2	Personal Attributes	Aptitude for conducting training, and pre/post work to ensure competent, employable candidates at the end of the training. Strong communication skills, interpersonal skills, ability to work as part of a team; a passion for quality and for developing others; well organised and focused, eager to learn and keep oneself updated with the latest in the mentioned field.
3	Minimum Educational Qualifications	Post graduate in Electrical / Electronic / Avionics and allied engineering branches and equivalent qualification
4a	Domain Certification	Statutory Certificate from Aerospace and Aviation Sector Skill Council (AASSC) for Job Role: “Design Engineer Avionics/Electrical Systems” mapped to QP: “AAS/Q3102”. Minimum accepted score for domain certification will be 80%.
4b	Platform Certification	Recommended that the Trainer is certified for the job role “Trainer” mapped to the Qualification Pack : “MEP/Q 0102”. Minimum accepted percentage as per respective SSC guidelines is 80%.
5	Experience	2-3 years of experience

Annexure : Assessment Criteria

Job Role: Design Engineer Avionics Systems

Qualification Pack: AAS/Q3102

Sector Skill Council: Aerospace and Aviation Sector Skill Council

Guidelines for Assessment

1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC.
2. The assessment for the theory part will be based on knowledge bank of questions created by the SSC.
3. Assessment will be conducted for all compulsory NOS, and where applicable, on the selected elective/option NOS/set of NOS.
4. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training center (as per assessment criteria below).
5. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training center based on this criterion.
6. To pass the Qualification Pack, every trainee should score a minimum of 70% of aggregate marks to successfully clear the assessment.
7. In case of unsuccessful completion, the trainee may seek reassessment on the Qualification Pack.

Compulsory NOS Total Marks: 100		Marks Allocation			
Assessment outcomes	Assessment Criteria for outcomes	Total Marks	Out of	Theory	Skills Practical
1. SSC/N0703 Create documents for knowledge sharing	PC1. establish with appropriate people the purpose, scope, formats and target audience for the documents	100	5	5	0
	PC2. access existing documents, language standards, templates and documentation tools from your organization's knowledge base		15	0	15
	PC3. liaise with appropriate people to obtain and verify the information required for the documents		5	5	0
	PC4. confirm the content and structure of the documents with appropriate people		10	0	10
	PC5. create documents using standard templates and agreed language standards		25	0	25
	PC6. review documents with appropriate people and incorporate their inputs		10	0	10

	PC7. submit documents for approval by appropriate people		5	5	0
	PC8. publish documents in agreed formats		5	5	0
	PC9. update your organization's knowledge base with the documents		5	5	0
	PC10. comply with your organization's policies, procedures and guidelines when creating documents for knowledge sharing		15	0	15
	Total		100	25	75

Compulsory NOS Total Marks: 100		Marks Allocation			
Assessment outcomes	Assessment Criteria for outcomes	Total Marks	Out of	Theory	Skills Practical
2. AAS/N3102 Create, maintain and design avionics systems	PC1. perform conceptual and detailed avionics system design and analysis as required for variety of airborne platforms with inputs from ARP 5761 and ARP 4754	100	10	4	6
	PC2. develop functional algorithms for avionics systems/LRUs and allied systems		10	4	6
	PC3. develop PVI/MMI specifications and associated logics		10	4	6
	PC4. perform modelling & simulation studies and analysis		10	4	6
	PC5. source/realize the avionics LRUs/development environment/testing environment		10	4	6
	PC6. perform software development and software engineering process as per DO 178C for development of avionics systems/on-board computers & ground integration rigs / test equipment		10	4	6
	PC7. perform hardware development and hardware engineering process as per DO 254 as applicable for complex electronics only for development of avionics systems/on-board computers & ground integration rigs / test equipment		10	4	6
	PC8. perform software-software integration, hardware-software integration, static/dynamic testing, simulator testing, and hardware-in-loop system testing		10	4	6
	PC9. perform system Integration of Avionics System on rig/simulator/aircraft		10	4	6

	PC10. perform System Qualification as per DO 160G		6	2	4
	PC10. take up technology development/futuristic projects		4	1	3
	Total		100	39	61

Compulsory NOS Total Marks: 100		Marks Allocation			
Assessment outcomes	Assessment Criteria for outcomes	Total Marks	Out of	Theory	Skills Practical
3. AAS/N3112 Create, maintain and design electrical systems	PC1. perform conceptual and detailed electrical system design and analysis as required for variety of airborne platforms	100	16	6	10
	PC2. design power conversion system, circuit designs and power systems design		16	6	10
	PC3. develop circuit and wiring diagrams, block diagrams, schematics, electrical cabling/routing, installation, assembly of panels and sub-assemblies and system design/modification		16	6	10
	PC4. select the appropriate equipment and drawing software to use, based on the type and complexity of the drawing functions to be carried out		16	6	10
	PC5. use current British, European, International and company standards to produce a drawing template for a range of paper sizes, and include the drawing title, scale used, date of drawing and other relevant information		16	6	10
	PC6. produce fully detailed drawings, to enable the electrical circuits to be assembled, installed, maintained, commissioned or modified		20	6	14
	Total		100	36	64

Compulsory NOS Total Marks: 100		Marks Allocation			
Assessment outcomes	Assessment Criteria for outcomes	Total Marks	Out of	Theory	Skills Practical
4. AAS/N3113 Follow systems engineering approach to design	PC1. interact with various stakeholders at various stage to capture the functional requirements, operational concepts, certification requirements, and arrive at an optimal solution with adequate design reviews at various stages and risk mitigations.	100	10	4	6

	PC2. ensuring that a systems engineering approach (or equivalent) to capability prototype and development is employed	10	4	6
	PC3. perform physical testing of harness and support other engineers to install and test prototypes	10	4	6
	PC4. develop the required design artefacts in support of capability introduction	10	4	6
	PC5. develop required design artefacts in support of electrical load analysis, wiring diagrams, engineering drawings, etc.	10	4	6
	PC6. assist with development and delivery of the prototype deliverables for new capabilities, including but not limited to: Detailed Product Description (DPD), Design Specification Package (DSP), Drawings, Test Order and Test Report	10	4	6
	PC7. perform prototype harnessing assemblies and drive to closure, all systems integration trades related to those assemblies	10	4	6
	PC8. obtain approvals from appropriate design authority	10	4	6
	PC9. approve items for purchase such as harness, panels, sensors, LRUs, circuit boards, harness mounts, testing & measurement equipments, software tools etc. post offers from different suppliers and release installation drawings as per approved plan	10	4	6
	PC10. analysis on reliability, failure modes, impact of failures, criticality, redundancy, and maintainability aspects.	5	2	3
	PC11. conform to configuration management and change control procedures and policies	5	2	3
	Total	100	40	60

Compulsory NOS Total Marks: 100		Marks Allocation			
Assessment outcomes	Assessment Criteria for outcomes	Total Marks	Out of	Theory	Skills Practical
5. AAS/N0503 Work Effectively in a Team	PC1. display courteous and helpful behaviour at all times	100	6	3	3
	PC2. take opportunities to enhance the level of assistance offered to colleagues		7	3	4
	PC3. meet all reasonable requests for assistance within acceptable workplace timeframes		6	3	3

PC4. complete allocated tasks as required	6	3	3
PC5. seek assistance when difficulties arise	7	3	4
PC6. use questioning techniques to clarify instructions or responsibilities	6	3	3
PC7. identify and display a non discriminatory attitude in all contacts with customers and other staff members	6	3	3
PC8. observe appropriate dress code and presentation as required by the workplace, job role and level of customer contact	7	3	4
PC9. follow personal hygiene procedures according to organisational policy and relevant legislation	7	3	4
PC10. interpret, confirm and act on workplace information, instructions and procedures relevant to the particular task	7	3	4
PC11. interpret, confirm and act on legal requirements in regard to anti-discrimination, sexual harassment and bullying	7	3	4
PC12. ask questions to seek and clarify workplace information	7	3	4
PC13. plan and organise daily work routine within the scope of the job role	7	3	4
PC14. prioritise and complete tasks according to required timeframes	7	3	4
PC15. identify work and personal priorities and achieve a balance between competing priorities	7	3	4
Total	100	45	55

Compulsory NOS Total Marks: 100		Marks Allocation			
Assessment outcomes	Assessment Criteria for outcomes	Total Marks	Out of	Theory	Skills Practical
6. AAS/N3201 Organisational safety and information security	PC1. comply with your organisation's IT policies and procedures for safety of data and information	100	10	5	5
	PC2. adhere to the organisation's policies pertaining to accesses granted, usage, modification of any information or recording or destruction of information		10	5	5
	PC3. report any identified breaches of data or information in any form to the authority as described by the organisation		10	5	5
	PC4. report any theft of intellectual property according to the organisation policy		20	10	10



	PC5. record, control the document version and take appropriate approvals for the document, plans or drawings according to organisational hierarchy		10	5	5
	PC6. follow your organisation's safety procedures at workplace and act promptly, calmly, and efficiently in case of disruption		20	10	10
	PC7. recommend improvement related to safety and security at the workplace		10	5	5
	PC8. comply to any health and safety requirements set by an organisation		10	5	5
	Total		100	50	50