
Model Curriculum

Aerospace Design Assistant (Elective 1: Mechanical) (Elective 2: Electrical)

SECTOR: AEROSPACE AND AVIATION
SUB-SECTOR: DESIGN AND DEVELOPMENT
OCCUPATION: AEROSPACE DESIGN/R&D
REF ID: AAS/Q3106, V1.0
NSQF LEVEL: 4



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 : **'Aerospace Design Assistant (Elective 1: Mechanical) (Elective 2: Electrical)'** QP No. **'AAS/Q3106' NSQF level 4'**

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)

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Aerospace Design Assistant

(Elective 1: Mechanical) (Elective 2: Electrical)

CURRICULUM / SYLLABUS

This program is aimed at training candidates for the job of a “Aerospace Design Assistant (Elective 1: Mechanical) (Elective 2: Electrical)”, in the “Aerospace and Aviation” Sector/Industry and aims at building the following key competencies amongst the learner

Program Name	Aerospace Design Assistant (Elective 1: Mechanical) (Elective 2: Electrical)		
Qualification Pack Name & Reference ID.	AAS/Q3106		
Version No.	1.0	Version Update Date	10 – 11 - 2017
Pre-requisites to Training	Pursuing final year diploma (for training purpose) Diploma in Mechanical / Aeronautical / Electrical and allied engineering branches(for Job entry)		
Training Outcomes	<p>After completing this programme, participants will be able to</p> <ul style="list-style-type: none"> • provide direction to the technical team with respect to flow down of system requirements • oversees investigations and analysis • oversees integration of system elements with the system • accept all engineering responsibilities for a particular application • interface with customers (government and commercial), program office, operations, and internal support groups as required. • Achieve basic communication skills and good inter-personal skills. • Work well in a team 		

This course encompasses 4 out of 4 Compulsory National Occupational Standards (NOS), 3 out of 3 Elective NOS of “Aerospace Design Assistant (Elective 1: Mechanical) (Elective 2: Electrical)”, Qualification Pack issued by “Aerospace & Aviation Sector Skill Council (AASCC)”.

Compulsory NOS :			
Sr. No.	Module	Key Learning Outcomes	Equipment Required
1	<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 the 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 the organization’s knowledge base with the documents • comply with the organization’s policies, procedures and guidelines when • creating documents for knowledge sharing 	<p>White/Black board/ Chart paper, Markers/Computer and projector, trainer’s guide, student handbook</p>
2	<p>Create and develop design documents Theory Duration (hh:mm) 99:00 Practical Duration (hh:mm) 125:00 Corresponding NOS Code AAS/N3106</p>	<p>Candidates will be able to:</p> <ul style="list-style-type: none"> • produce drawings, charts, graphs, wiring schematics, structure layouts and tables from specified instructions using standard drafting procedures to depict new components, assemblies, systems, or subsystems • use computer-aided design or other graphic tools or drafting techniques to perform scaling, dimensioning, or line location • calculate various dimensions or weights or volume using 	<p>White/Black board/ Chart paper, Markers/Computer and projector, trainer’s guide, student handbook</p>

Compulsory NOS :

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		<p>mathematical formulae from the graphical model developed</p> <ul style="list-style-type: none"> • work with engineers and developers to accurately depict the desired design characteristics • recommend design modifications to improve quality of product and facilitate manufacturing operations • assist plant employees in obtaining necessary drawings including blue prints of manufacturing drawings and information to implement improvements • create as-built drawings and Field Walk Downs to ensure product conformity as per customer specification • 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 • ensure clarity in the design processes documentations • analyse strength for metal and composites • obtain approvals from appropriate design authority • conform to configuration management and change control procedures and policies • assist/participate in design reviews, customer audits • co-ordinate within the team and effectively communicate with all levels of the organisation 	
3	<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 required • seek assistance when difficulties arise 	<p>White/Black board/ Chart paper, Markers/Computer and projector, trainer's guide, student handbook</p>

Compulsory NOS :

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		<ul style="list-style-type: none"> • 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 and relevant legislation • interpret, confirm and act on workplace information, instructions and procedures relevant to the particular task • interpret, confirm and act on legal requirements in regard 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 	
4	<p>Maintain organisational safety and information security Theory Duration (hh:mm) 24:00 Practical Duration (hh:mm) 24:00 Corresponding NOS Code AAS/N0502</p>	<p>Candidates will be able to:</p> <ul style="list-style-type: none"> • comply with the organization'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 organization's safety 	<p>White/Black board/ Chart paper, Markers/Computer and projector, trainer's guide, student handbook, Charts regarding health & hygiene</p>

Compulsory NOS :			
Sr. No.	Module	Key Learning Outcomes	Equipment Required
		<p>procedures at workplace and act promptly, calmly, and efficiently in case of disruption</p> <ul style="list-style-type: none"> • recommend improvement related to safety and security at the workplace • comply to any health and safety requirements set by an organisation 	
	<p>COMPULSORY NOS: Total Duration Theory Duration (hh:mm) 149:00 Practical Duration (hh:mm) 203:00</p>		

ELECTIVES (Mandatory to select at least one title)

ELECTIVE 1: Mechanical

1.1	<p>Make or modify 2D mechanical engineering drawings using CAD system Theory Duration (hh:mm) 34:00 Practical Duration (hh:mm) 78:00 Corresponding NOS Code CSC/N0402</p>	<p>Candidates will be able to:</p> <ul style="list-style-type: none"> • use appropriate sources to obtain the technical information relevant to the drawing to be created • Technical information relevant to the drawing to be created: drawing brief; specifications(overall dimensions, materials, special procedures for manufacturing); drawing change or modification request; regulations; existing drawings/designs, sketches, notes from meetings/discussions; standards reference documents (e.g. limits and fits, tapping drill charts, contraction allowances) • identify design features, as appropriate to the drawing being produced Design features: function, materials, clearance, operating environment, quality, aesthetics, interfaces, physical space; tolerances • ensure that the data and information received is complete and correct • establish the drawing requirements from the data and information received • report and rectify incorrect and inconsistent information in job specification documents as per organisation procedures • access and use the correct drawing software 	<p>White/Black board/ Chart paper, Markers/Computer and projector, trainer's guide, student handbook</p>
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Compulsory NOS :

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		<ul style="list-style-type: none"> • select drafting equipment appropriate to the drawing method chosen • check that all the equipment is correctly connected and in a safe and usable working condition • power up the equipment and activate the appropriate drawing software • customize system variables, menus and drawing defaults to produce the drawing to the appropriate scale • develop macros as per approved procedures • set up and check that all peripheral devices are connected and correctly operating and interface with ERP if required is available • set the drawing datum at a convenient point • set up drawing parameters (e.g. layers, line types, color, text styles) to company procedures or to suit the drawing produced • interpret and produce mechanical drawings, using first angle orthographic projections, isometric/oblique projections, third angle orthographic projections, sectional views • apply drafting principles to produce various types of drawings that are consistent with applicable standards and procedures for use in various engineering activities • detail drawings, sub-assembly drawings, general arrangement drawings, installation drawings, exploded views Standards and procedures: organizational guidelines and procedures, recognized compliance agency/body standards, directives or codes of practice, CAD software standards/protocols, national and/or International standards or directives, customer standards and requirements, health, safety and 	

Compulsory NOS :

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		<p>environmental requirements</p> <p>Engineering Activities: production activities (such as processing of materials, fabrication, finishing, assembly, joining); installation activities (such as commissioning/decommissioning, site preparation, equipment installation), operational activities (such as movement of materials, workplace layouts, work-flow diagrams), maintenance activities (such as planned preventative maintenance, part/sub-assembly exchange)</p> <ul style="list-style-type: none"> • create a drawing template to the required standards, which includes all necessary detail (e.g.) using various drawing tools • use appropriate terminologies and techniques to create drawings, in the required formats, that are sufficiently and clearly detailed • use keyboard command and pull down menus available in common CAD systems • use codes and other references that follow the required conventions • draw temporary fasteners and rivets • draw components details and assembly drawings • draw piping layouts, gears and machine foundation or bas • draw working drawings of jigs and fixtures • draw detailed drawings of dies, moulds and press tools • dimension and label the drawing as per approved procedures • create detailed views using various scales to meet job requirements • ensure that drawings are checked and approved by the appropriate person • produce hard copies of the finished drawings • check that the drawing is correctly titled and referenced; sawing is 	

Compulsory NOS :

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		<p>correctly titled and referenced</p> <ul style="list-style-type: none"> • save the drawing to an appropriate storage medium (e.g. hard drive, CD/DVD, external storage device) • create a separate backup copy and place it in safe storage • identify component parts list with part name, description of part, material specification or part number, quantities and other details to prepare bill of materials as per organizational guidelines • deal promptly and effectively with problems within control and seek help and guidance from the relevant people if you have problems that they cannot resolve • ensure that changes are completed as required by organizational procedures • shut down the CAD system to a safe condition on completion of the drawing activities 	
1.2	<p>Make or modify 3D mechanical engineering models using CAD system Theory Duration (hh:mm) 35:00 Practical Duration (hh:mm) 77:00 Corresponding NOS Code CSC/N0408</p>	<p>Candidates will be able to:</p> <ul style="list-style-type: none"> • plan the modelling activities before starting them • use appropriate sources to obtain the required information like, model brief/request, specifications, change order/modification request, regulations, manuals, sample component, calculations, previous models/designs, sketches, notes from meetings/discussions, standards reference documents (such as limits and fits, tapping drill charts), other available data • access and use the correct modelling software and tools like, solid modelling, wire frame modelling, surface modelling • check that all the equipment is correctly connected and in a safe and usable working condition • power up the equipment and activate the appropriate modelling tools • set up the modelling environment 	<p>White/Black board/ Chart paper, Markers/Computer and projector, trainer's guide, student handbook</p>

Compulsory NOS :

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		<p>and select a suitable template/folder</p> <ul style="list-style-type: none"> • set up and check that all peripheral devices are connected and correctly operating (such as keyboard, mouse, light pen, digitizer/tablet, scanner, printer, plotter) • set the drawing datum at a convenient point to create a modelling template with title, file number, material, date • establish coordinate system, orientation and views as per the job • create entities in 3D space as per job requirement • modify entities in 3D space as per job requirement • create 3-D views on the screen by manipulating drawing planes and inserting 3-D geometric shapes • creating swept, extruded and revolved solids in 3-D space • produce sectioned models (cutting planes and cross hatching) • use pre-drawn library files and primitives to produce a 3-D model • extracting mass and area properties from solid model • identify and use key features of solid modelling software package to produce models with key features like extrude, extrude cut, solid model, mirror, revolve, wire frame, radius/chamfer, hide, rib, rectangular pattern, fillet, cut/remove, circular pattern, shell, development view, motion analysis, animation, defining material property, exploded views • perform drawing for solid modelling • extract physical properties as per job requirement, including volume, mass and Centre of gravity • take into account the following factors, as appropriate to the model being produced Factors: function, cost, physical space, quality, lifetime of the product, operating environment, manufacturing 	

Compulsory NOS :

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		<p>method, tolerances, interfaces, ergonomics, clearance, safety, materials, aesthetics, apply rendering techniques</p> <ul style="list-style-type: none"> • use pan, isometric and zoom CAD operations to highlight design areas in the modelling environment • modify parts in the assembly environment using the following features: constrained parts and assemblies, straight lines, insertion of standard components, hidden detail, dimensions, symbols and abbreviations, hatching and shading, angular surfaces, curved surfaces, parts lists, text, circles or ellipses, material color, surface texture • produce 3-D drawings incorporating section views with all necessary annotation • produce a model for export to the following manufacturing systems like, DNC (Direct Numerically controlled) /CNC(Computer Numerically controlled) machines; 3D printer; other specific system • produce models which comply with organizational guidelines; statutory regulations and codes of practice; CAD software standards; national and international standards • confirm that the model is as per job specifications and contains all relevant information • use appropriate techniques to create models that are sufficiently and clearly detailed • use codes and other references that follow the required conventions • make sure that models are checked and approved by the appropriate person • save the models in the appropriate file type and location • produce hard copies of the finished models, with sufficient detail to allow production • deal promptly and effectively with 	

Compulsory NOS :

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		<p>problems within your control, and seek help and guidance from the relevant people if you have problems that you cannot resolve</p> <ul style="list-style-type: none"> shut down the CAD system to a safe condition on completion of the modelling activities 	
	<p>ELECTIVE 1 : Total Duration Theory Duration (hh:mm) 69:00 Practical Duration(hh:mm) 155:00</p>		

Elective 2: Electrical

2.1	<p>Assist in developing electrical system Theory Duration (hh:mm) 110:00 Practical Duration (hh:mm) 114:00 Corresponding NOS Code AAS/N3110</p>	<p>Candidates will be able to:</p> <ul style="list-style-type: none"> co-ordinate with designers to understand the specifications, standards and methodology to produce drawings collect information on load, routing requirement, connector types, power terminals etc. from designer. co-ordinate and collect information from other engineering designers to understand the aerospace structural layout apply engineering concepts, processes and principles in developing the drawings develop circuit and wiring diagrams, block diagrams, schematics, electrical cabling/routing, installation, assembly of panels and sub-assemblies and system design/modification prepare drawings using AutoCAD, CATIA, CAD or Pro E software assist in preparation of Detailed Product Description (DPD), Design Specification Package (DSP), drawings, test order and reports minimise errors in the engineering drawing and suggest suitable changes 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 obtain approvals from appropriate design authority timely interact with manufacturing 	<p>White/Black board/ Chart paper, Markers/Computer and projector, trainer's guide, student handbook</p>
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Compulsory NOS :

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		team in case any clarifications required <ul style="list-style-type: none"> conform to configuration management and change control procedures and policies assist/participate in design reviews and customer audits co-ordinate within the team and effectively communicate with all levels of the organisation 	
	ELECTIVE 2 : Total Duration Theory Duration (hh:mm) 110:00 Practical Duration(hh:mm) 114:00		
	GRAND Total Duration Minimum Duration for the QP= 576 Hrs Theory: 218 hrs Practical: 358 hrs Maximum Duration for the QP= 576 hrs Theory: 259 Hrs Practical: 317 Hrs	Unique equipment used <ul style="list-style-type: none"> 2D/3D CAD software 	

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

Trainer Prerequisites for Job role: “Aerospace Design Assistant (Elective 1: Mechanical) (Elective 2: Electrical) ” mapped to Qualification Pack: “AAS/Q3106”

Sl. No.	Area	Details
1	Description	To deliver accredited training service, mapping to the curriculum detailed above, in accordance with the Qualification Pack “AAS/Q3106”.
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	Diploma/Bachelor degree in Mechanical / Aeronautical / Electrical / Electronics and allied engineering branches.
4a	Domain Certification	Statutory Certificate from Aerospace and Aviation Sector Skill Council (AASSC) for Job Role: “Aerospace Design Assistant” mapped to QP: “AAS/Q3106”. 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	10 yrs for Diploma/5 yrs for Bachelor degree holder.

Annexure : Assessment Criteria

Job Role: Aerospace Design Assistant

Qualification Pack: AAS/Q3106

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 centre (as per assessment criteria below).
5. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training centre 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/N3106 Create and develop design documents	PC1. produce drawings, charts, graphs, wiring schematics, structure layouts and tables from specified instructions using standard drafting procedures to depict new components, assemblies, systems, or subsystems	100	8	4	4
	PC2. use computer-aided design or other graphic tools or drafting techniques to perform scaling, dimensioning, or line location		8	4	4
	PC3. calculate various dimensions or weights or volume using mathematical formulae from the graphical model developed		7	3	4
	PC4. work with engineers and developers to accurately depict the desired design characteristics		7	3	4
	PC5. recommend design modifications to improve quality of product and facilitate manufacturing operations		7	3	4
	PC6. assist plant employees in obtaining necessary drawings including blue prints of manufacturing drawings and information to implement improvements		7	3	4
	PC7. create as-built drawings and Field Walk Downs to ensure product conformity as per customer specification		7	3	4
	PC8. 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		7	3	4
	PC9. ensure clarity in the design processes documentations		7	3	4
	PC10. analyse strength for metal and composites		7	3	4

	PC11. obtain approvals from appropriate design authority		7	3	4
	PC12. conform to configuration management and change control procedures and policies		7	3	4
	PC13. assist/participate in design reviews, customer audits		7	3	4
	PC14. co-ordinate within the team and effectively communicate with all levels of the organisation		7	3	4
Total			100	44	56

Compulsory NOS Total Marks: 100		Marks Allocation			
Assessment outcomes	Assessment Criteria for outcomes	Total Marks	Out of	Theory	Skills Practical
3. 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 with regards 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	100	45	55

Compulsory NOS Total Marks: 100		Marks Allocation			
Assessment outcomes	Assessment Criteria for outcomes	Total Marks	Out of	Theory	Skills Practical
4. AAS/N3201 Maintain organisational safety and information security	PC1. comply with your organisation's IT policies and procedures for safety of data and	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 documents, 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 the organisation		10	5	5
		Total	100	50	50
Elective Elective 1: Mechanical design assistant Total Marks: 100		Marks Allocation			
Assessment outcomes	Assessment Criteria for outcomes	Total Marks	Out of	Theory	Skills Practical
1.1. CSC/N0402 Make or modify 2D mechanical engineering drawings using CAD system	PC1. use appropriate sources to obtain the technical information relevant to the drawing to be created Technical information relevant to the drawing to be created: drawing brief; specifications(overall dimensions, materials, special procedures for manufacturing); drawing change or modification request; regulations; existing drawings/designs, sketches, notes from meetings/discussions; standards reference documents (e.g. limits and fits, tapping drill charts, contraction allowances)	100	2	0	2

PC2. identify design features, as appropriate to the drawing being produced Design features: function, materials, clearance, operating environment, quality, aesthetics, interfaces, physical space; tolerances	4	2	2
PC3. ensure that the data and information received is complete and correct	2	0	2
PC4. establish the drawing requirements from the data and information received	3	1	2
PC5. report and rectify incorrect and inconsistent information in job specification documents as per organisation procedures	3	1	2
PC6. access and use the correct drawing software	2	1	1
PC7. select drafting equipment appropriate to the drawing method chosen	3	1	2
PC8. check that all the equipment is correctly connected and in a safe and usable working condition	1	0	1
PC9. power up the equipment and activate the appropriate drawing software	1	0	1
PC10. customize system variables, menus and drawing defaults to produce the drawing to the appropriate scale	3	1	2
PC11. develop macros as per approved procedures	4	2	2
PC12. set up and check that all peripheral devices are connected and correctly operating and interface with ERP if required is available Peripheral devices could be: keyboard, mouse, light pen, digitizer/tablet, scanner, printer, plotter, etc.	2	0	2
PC13. set the drawing datum at a convenient point	2	0	2
PC14. set up drawing parameters (e.g. layers, line types, colour, text styles) to company procedures or to suit the drawing produced	3	1	2
PC15. interpret and produce mechanical drawings, using first angle orthographic projections, isometric/oblique projections, third angle orthographic projections, sectional views	5	2	3

	<p>PC16. apply drafting principles to produce various types of drawings that are consistent with applicable standards and procedures for use in various engineering activities. Types of drawings: detail drawings, sub-assembly drawings, general arrangement drawings, installation drawings, exploded views Standards and procedures: organizational guidelines and procedures, recognized compliance agency/body standards, directives or codes of practice, CAD software standards/protocols, national and/or International standards or directives, customer standards and requirements, health, safety and environmental requirements Engineering Activities: production activities (such as processing of materials, fabrication, finishing, assembly, joining); installation activities (such as commissioning/decommissioning, site preparation, equipment installation); operational activities (such as movement of materials, workplace layouts, work-flow diagrams), maintenance activities (such as planned preventative maintenance, part/sub-assembly exchange)"</p>		5	2	3
	<p>PC17. create a drawing template to the required standards, which includes all necessary detail (e.g.) using various drawing tools Drawing template details: layers of drawings, scale, paper size, colour setup, line types, dimension system, title, drawing number, date, text styles Drawing Tools: straight lines, hatching and shading on drawings, adding dimensions and text to drawings, producing layers of drawings, symbols and abbreviations, hidden detail, curved/contour lines, angled lines, circles or ellipses; parts lists, geometrical and dimensional tolerance, insertion of standard components, elevation, plan view, side view, sectional views, detail views"</p>		5	2	3
	<p>PC18. use appropriate terminologies and techniques to create drawings, in the required formats, that are sufficiently and clearly detailed</p>		4	2	2
	<p>PC19. use keyboard command and pull down menus available in common CAD systems</p>		2	1	1
	<p>PC20. use codes and other references that follow the required conventions</p>		3	1	2
	<p>PC21. draw temporary fasteners and rivets</p>		3	1	2
	<p>PC22. draw components details and assembly drawings</p>		4	1	3

PC23. draw piping layouts, gears and machine foundation or base	4	1	3
PC24. draw working drawings of jigs and fixtures	4	1	3
PC25. draw detailed drawings of dies, moulds and press tools	4	1	3
PC26. dimension and label the drawing as per approved procedures	4	1	3
PC27. create detailed views using various scales to meet job requirements	3	1	2
PC28. ensure that drawings are checked and approved by the appropriate person	1	0	1
PC29. produce hard copies of the finished drawings	1	0	1
PC30. check that the drawing is correctly titled and referenced; sawing is correctly titled and referenced	2	0	2
PC31. save the drawing to an appropriate storage medium (e.g. hard drive, CD/DVD, external storage device)	1	0	1
PC32. create a separate backup copy and place it in safe storage	1	0	1
PC33. identify component parts list with part name, description of part, material specification or part number, quantities and other details to prepare bill of materials as per organizational guidelines	4	2	2
PC34. deal promptly and effectively with problems within control and seek help and guidance from the relevant people if you have problems that they cannot resolve	2	0	2
PC35. ensure that changes are completed as required by organizational procedures	2	1	1
PC36. shut down the CAD system to a safe condition on completion of the drawing activities	1	0	1
Total	100	30	70

Elective		Marks Allocation			
Elective 1: Mechanical design assistant					
Total Marks: 100					
Assessment outcomes	Assessment Criteria for outcomes	Total Marks	Out of	Theory	Skills Practical
1.2. CSC/N0408 Make or modify 3D mechanical engineering drawings using CAD system	PC1. plan the modelling activities before starting them		3	1	2
	PC2. use appropriate sources to obtain the required information		3	1	2
	PC3. access and use the correct modelling software		3	1	2

PC4. check that all the equipment is correctly connected and in a safe and usable working condition	100	3	1	2
PC5. power up the equipment and activate the appropriate modelling software		2	1	1
PC6. set up the modelling environment and select a suitable template/folder		4	1	3
PC7. set up and check that all peripheral devices are connected and correctly operating (such as keyboard, mouse, light pen, digitizer/tablet, scanner, printer, plotter)		4	1	3
PC8. set the drawing datum at a convenient point to create a modelling template with title, file number, material, date		4	1	3
PC9. establish coordinate system, orientation and views as per the job requirement		4	1	3
PC10. create entities in 3D space as per job requirement		3	1	2
PC11. modify entities in 3D space as per job requirement		3	1	2
PC12. create 3-D views on the screen by manipulating drawing planes and inserting 3-D geometric shapes		4	1	3
PC13. creating swept, extruded and revolved solids in 3-D space		4	1	3
PC14. produce sectioned models (cutting planes and cross hatching)		4	1	3
PC15. use pre-drawn library files and primitives to produce a 3-D model		4	1	3
PC16. extracting mass and area properties from solid model		4	1	3
PC17. Identify and use key features of solid modelling software package		3	1	2
PC18. perform drawing for solid modelling		3	1	2
PC19. extract physical properties as per job requirement, including volume, mass and centre of gravity		3	1	2
PC20. take into account the following factors, as appropriate to the model being produce		3	1	2
PC21. use pan, isometric and zoom CAD operations to highlight design areas in the modelling environment		4	1	3
PC22. modify parts in the assembly environment using the following features		4	1	3
PC23. produce 3-D drawings incorporating section views with all necessary annotation		3	1	2
PC24. produce a model for export to the following manufacturing systems		3	1	2

PC25. produce models which comply with organizational guidelines; statutory regulations and codes of practice; CAD software standards; national and international standards	2	1	1
PC26. confirm that the model is as per job specifications and contains all relevant information	2	1	1
PC27. use appropriate techniques to create models that are sufficiently and clearly detailed	2	1	1
PC28. use codes and other references that follow the required conventions	2	1	1
PC29. make sure that models are checked and approved by the appropriate person	2	1	1
PC30. save the models in the appropriate file type and location	2	1	1
PC31. produce hard copies of the finished models, with sufficient detail to allow production	2	1	1
PC32. deal promptly and effectively with problems within your control, and seek help and guidance from the relevant people if you have problems that you cannot resolve	2	1	1
PC33. shut down the CAD system to a safe condition on completion of the modelling	2	1	1
Total	100	33	69

Elective Elective 2: Electrical design assistant Total Marks: 100		Marks Allocation			
Assessment outcomes	Assessment Criteria for outcomes	Total Marks	Out of	Theory	Skills Practical
2.1. AAS/N3110 Assist in developing electrical system design	PC1. co-ordinate with designers to understand the specifications, standards and methodology to produce drawings	100	6	3	3
	PC2. collect information on load, routing requirement, connector types, power terminals etc. from designer.		7	3	4
	PC3. co-ordinate and collect information from other engineering designers to understand the aerospace structural layout		6	3	3
	PC4. apply engineering concepts, processes and principles in developing the drawings		6	3	3
	PC5. develop circuit and wiring diagrams, block diagrams, schematics, electrical cabling/routing, installation, assembly of panels and sub-assemblies and system design/modification		7	3	4
	PC6. prepare drawings using AutoCAD, CATIA, CAD or Pro E software		6	3	3

PC7.	assist in preparation of Detailed Product Description (DPD), Design Specification Package (DSP), drawings, test order and reports	6	3	3
PC8.	minimise errors in the engineering drawing and suggest suitable changes	8	4	4
PC9.	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	8	4	4
PC10.	obtain approvals from appropriate design authority	8	4	4
PC11.	timely interact with manufacturing team in case any clarifications required	8	4	4
PC12.	conform to configuration management and change control procedures and policies	8	4	4
PC13.	conduct/participate in design reviews and customer audits	8	4	4
PC14.	co-ordinate within the team and effectively communicate with all levels of the organisation	8	4	4
Total		100	49	51