

**Metal and Engineering
Training Package
Western Australian
Implementation Guide**

**Western Australian
Department of Training And Employment**

MEM 98

October 1999

FOREWORD

This Implementation Kit has been generated to enable stakeholders in the industry sector in Western Australia to participate in the managed implementation of the Training Package.

This Training Package has been developed through great effort and significant co-operation within industry. To achieve maximum advantages from the Package, its implementation needs to occur in a planned manner.

The Metal and Engineering Implementation Kit provides information to enable that to be achieved.

While the Kit in general reflects the Western Australian Department of Training and Employment's intent, it does not define policy, nor does it make statements or set values which are not subject to further consideration in the light of experience gained through the implementation of the Training Packages.

TABLE OF CONTENTS

Acknowledgements	4
INTRODUCTION	5
EXISTING COURSES TO BE REPLACED BY TRAINING PACKAGE QUALIFICATIONS	8
TRANSITION ARRANGEMENTS	13
ASSIGNMENT OF NOMINAL HOURS TO UNITS OF COMPETENCY	14
MODEL TRAINING PATHWAYS	27
ASSESSMENT IMPLICATIONS	63
LICENSING REQUIREMENTS	65

ACKNOWLEDGEMENTS

The Western Australian Metals and Engineering Training Package (MEM 98), Implementation Guide was developed by Midland College of TAFE in conjunction with the WA TAFE Metals Consortium, on behalf of the Western Australian Department of Training (WADT).

To ensure the needs of key stake holders were addressed consultation was undertaken with the Metals, Manufacturing and Services ITC, employer groups and a wide range of Registered Training Organisations and industry representatives from both metropolitan and regional areas of Western Australia. The WADT acknowledges the contribution of the many individuals, groups and organisations who constructively contributed to the development of this guide. Special thanks go to the members of the State Reference Group, the Project Steering Committee and the staff of the Metals, Manufacturing and Services ITC.

INTRODUCTION

BACKGROUND

1. The Metals and Engineering Training Package was developed by the MERSITAB to meet the training and skill recognition needs of the manufacturing and engineering industry in Australia.

Through agreed assessment procedures and qualification requirements the Training Package links the National Metals and Engineering Competency Standards to Australian Qualifications Framework (AQF) Qualifications.

The Training Package is designed to address all occupations in the industry with qualifications from Certificate I to Advanced Diploma.

The purpose of this Guide is to provide information that will facilitate the implementation of Metals and Engineering AQF Qualifications and their related arrangements in Western Australian (WA).

Accordingly, the Guide primarily focuses on the needs of Registered Training Organisations (RTO's) and is designed to be used in conjunction with the endorsed components of the Training Package and the MEM 98 Policy Document.

The Guide identifies and provides information on:

- existing, public funded, training courses in WA and their relationship to Training Package qualifications.
- Transition arrangements from existing courses to Training Package Qualifications.
- the allocation of nominal hours in regard to both the RTO and workplace components of Vocational Education and Training (VET). Nominal hours have been suggested for both replacement Qualifications and individual Competency Standard Units (CSU's).
- a range of Model Training Pathways, that provide practical examples of how to convert "old" module based courses to new CSU based AQF Qualifications. In conjunction with this, details of the alignment of National Metals and Engineering (NMEC, EPC and MEC) modules to the Industry CSU's are also provided.
- the impact of the Training Package on Apprenticeships; VET in Schools; Short Course delivery; on and off the job assessment and licensing requirements; and
- relevant learning and assessment materials

2. As many of the Metals and Engineering competency standards are yet to be developed and/or endorsed for the AQF levels V & VI this Guide only provides detailed guidelines for AQF level 1- IV qualifications.

It is expected that the Implementation Guide will be upgraded to include the higher level qualifications during the year 2000, when all necessary CSU's are available. Existing courses at this level will continue under current arrangements until that time.

Please Note:

This Implementation Guide must be read in conjunction with the "Metals and Engineering Training Package" MEM 98." Those readers who seek additional, background information on Training Packages and/or an understanding of the position of the industrial parties in WA should also read "Training Packages....The Next Step" which was produced by the Metals, Manufacturing and Services Industry, Training Council in WA.

Training Packages....The Next Step is available from:

Metals, Manufacturing and Services Industry Training Council
PO Box 6178
EAST PERTH WA 6892
Phone: (08) 9221 1980
Fax: (08) 9221 1990
Email merswa@ozemail.com.au

The Metals and Engineering Training Package can be purchased from:

Manufacturing, Engineering and Related Services Industry Training Advisory Body Ltd
(MERSITAB) PO BOX 289
NORTH SYDNEY NSW 2059
Phone: (02) 9955 5500
Fax: (02) 9955 8044
Email: info@mersitab.com.au
Website www.mersitab.com.au

The Western Australian Implementation Guide is available from:

Western Australian Department of Training (WADT)
Level 2, 151 Royal St.
EAST PERTH WA 6004
Website www.training.wa.gov.au

IMPLEMENTATION

It is a requirement, under the Australian Qualifications Framework (AQF), that Training Packages be used where they are available (Australian Qualifications Framework Advisory Board, 1998). The Western Australian Department of Training (WADT) has opted to manage the implementation of new packages through the development of Implementation Guides.

SCOPE OF REGISTRATION

The new Training Package qualifications have been analysed for their requirements in relation to 'capacity to deliver' and, where there are no changes to the Australian Qualifications Framework (AQF) level and the industry sub-sector of the new qualification, the Training Accreditation Council (TAC) will, on request, accept an RTO's change to their current scope of registration to issue the new qualifications.

TAC's transition arrangements specify that, as of January 1st 1998, training providers registered under the old system, would be deemed as Registered Training Organisations (RTO's) under the Australian Recognition Framework upon signing a new Registration Agreement (TAC, 1997).

The scope of registration will be based upon the set of courses that the organisation is currently registered to deliver. Existing providers were notified by the Training Accreditation Council of the new arrangements and were required to give an undertaking that they can operate in accordance with the new registration standards by June 30 1999.

Private Providers intending to offer a new qualification not covered by automatic coverage under their current scope of registration should apply to the TAC to extend their scope using the Registration Template.

The information contained in the remainder of this Guide should assist RTO's to prepare for this implementation.

EXISTING COURSES TO BE REPLACED BY TRAINING PACKAGE QUALIFICATIONS

The following information should be read in conjunction with the Sections on “Summary of Training Package Qualifications” and “Schedule of Requirements for Training Package qualifications” (pages 14-17 Metals and Engineering Training Package MEM98: Policy Document).

REPLACEMENT OF EXISTING ACCREDITED COURSES BY TRAINING PACKAGE QUALIFICATIONS

All states and Territories have agreed to phase out existing accredited courses which deliver the competencies in an endorsed Training Package.

The tables on pages 10-13 detail the WADT funded courses accredited in WA that will be replaced by the Training Package Qualifications. However, all copyright owners are responsible for reviewing their courses against the Training Package.

For RTO's, the focus of the new approach is on the achievement of competence rather than on the delivery of a curriculum. Existing National Metals modules can be used as part of the delivery strategy as long as assessment is undertaken and reported against the CSU's.

NOMINAL DURATION

The maximum nominal hours at an RTO are identified for each Training Package Qualification. Nominal hours may vary within a Qualification, depending on the CSU's selected and the delivery strategies used. Training delivery will not be funded beyond the maximum nominal hours and both delivery and assessment are included in the nominal hours.

SUMMARY OF EXISTING QUALIFICATIONS AND THEIR AQF REPLACEMENTS

Existing Course /Qualification	Nominal hours at RTO	New Training Package AQF Title	Nominal hours at RTO
3585 Engineering Traineeship	400	MEM20198 Certificate II in Engineering-Production	288
3584 Advanced Engineering Traineeship Entry may be on completion of 3585.	320 or 720	MEM20298 Certificate II in Engineering-Production Technology	576
3426 Aluminium Shipbuilding (composites) Level 2	400	MEM 20198 Certificate II in Engineering - Production	288
Aluminium Shipbuilding Level 2 <ul style="list-style-type: none"> • Fabrication • Marine Electrical • Marine Fitting • Shipwriting • Welding 	400	MEM 20198 Certificate II in Engineering – Production	288
3350 Certificate III in Engineering (Mechanical) ₁ Course covers traditional programs for: <ul style="list-style-type: none"> • Engineering Tradeperson – Mechanical Sub group <ul style="list-style-type: none"> • Mechanical Fitter • Plant Mechanics • Engine Reconditioning • First Class Machining • Fitting and Machining • Marine fitting • Lockmaking • Refrigeration Fitting • Watchmaking and Clock Repairs • Fuel Injection Fitter • Pattern Making • Electroplating 	864	MEM30298 Certificate III in Engineering-Mechanical Trade	864

SUMMARY OF EXISTING QUALIFICATIONS AND THEIR AQF REPLACEMENTS

Existing Course /Qualification	Nominal hours at RTO	New Training Package AQF Title	Nominal hours at RTO
3351 Certificate III in Engineering (Fabrication) ₂ Course covers traditional programs for: <ul style="list-style-type: none"> • Engineering Tradeperson – Fabrication Sub group <ul style="list-style-type: none"> • Boilermaker-Metal Construction • Boilermaker-Metal Construction/First Class Welding • First Class welding • Leadburning • Sheetmetal • Vehicle Body Building • Jewellery • Jobbing, Moulding and Coremaking 	864	MEM30398 Certificate III in Engineering-Fabrication Trade	864
3352 Certificate III in Engineering (Electrical) ₃ Course covers traditional programs for: <ul style="list-style-type: none"> • Engineering Tradeperson – Electrical Sub group <ul style="list-style-type: none"> • Electrical Fitter • Instrument/Electrical Fitter • Instrument Fitter 	864	MEM30498 Certificate III in Engineering-Electrical/Electronic Trade	864
3101 CTS Engineering Tradesperson Mechanical ₄	864	MEM30298 Certificate III in Engineering-Mechanical Trade (ongoing learners continue in existing 3101 Course)	864
3102 CTS Engineering Tradesperson Fabrication ₅	864	MEM30398 Certificate III in Engineering-Fabrication Trade (ongoing continue in existing 3102 Course)	864
3103 CTS Engineering Tradesperson Electrical/Electronic ₆	864	MEM30498 Certificate III in Engineering-Electrical/Electronic Trade (ongoing learners continue in existing 3103 Course)	864
3108 Metals and Engineering Course ₇	Up to 324	Ref Note 4 on Page 12	
3311 Metals and Engineering Assistant (VBB) ₈	540	MEM20198 Certificate II in Engineering-Production	288 + Workplace simulation

SUMMARY OF EXISTING QUALIFICATIONS AND THEIR AQF REPLACEMENTS

Existing Course /Qualification	Nominal hours at RTO	New Training Package AQF Title	Nominal hours at RTO
3260 Certificate in PVS – Metals and Engineering 9	540	MEM20198 Certificate II in Engineering-Production	288 + Workplace simulation
3261 Certificate in PVS- Metals and Engineering –Stage 2 Note: 3001 Certificate of Pre-Apprentice Studies, Electrical trades provides entry to Certificate III. The CPVS is under the Utilities ITC. 10	540	MEM20298 Certificate II in Engineering-Production Technology	576 + Workplace simulation
6400 Engineering Production Certificate 1	288	MEM20198 Certificate II in Engineering-Production	288
6401 Engineering Production Certificate 2 Note: entry via 6400	576	MEM20298 Certificate II in Engineering-Production Technology	576
6402 Engineering Production Certificate 3 Note: entry via 6401	864	MEM30198 Certificate III in Engineering-Production Systems	864
3932 Certificate III in Engineering (Technical) Note: Year 10 entry Plus Bridging where required	468	MEM30598 Certificate III in Engineering-Technician Note: Year 12 entry with maths and science from semester II, 2000	360
8962 Certificate IV in Engineering (General Pathway) Note: entry via Cert III.	360	MEM40198 Certificate IV in Engineering –Higher Engineering Trade Note: entry via Cert. III	324
8963 Certificate IV in Engineering (Fluid Power Pathway) Note: entry via Cert III.	360	MEM40198 Certificate IV in Engineering –Higher Engineering Trade Note: entry via Cert. III	324
8964 Certificate IV in Engineering (CNC/CAD-CAM Pathway) Note: entry via Cert III.	360	MEM40198 Certificate IV in Engineering –Higher Engineering Trade Note: entry via Cert. III	324
8965 Certificate IV in Engineering (Welding Pathway) Note: entry via Cert III.	360	MEM40198 Certificate IV in Engineering –Higher Engineering Trade Note: entry via Cert. III	324
8968 Certificate IV in Engineering (Instrumentation Pathway) Note: entry via Cert III.	360	MEM40198 Certificate IV in Engineering –Higher Engineering Trade Note: entry via Cert. III	324
3310 Certificate in Fixed Plant Maintenance	540	No equivalent	

SUMMARY OF EXISTING QUALIFICATIONS AND THEIR AQF REPLACEMENTS

Existing Course /Qualification	Nominal hours at RTO	New Training Package AQF Title	Nominal hours at RTO
9352 Advanced Certificate of Engineering, From 1/1/2000 will be 8969Certificate IV of Engineering: <ul style="list-style-type: none"> • Drafting • Non Destructive Testing • Mechanical Engineering • Electrical Drafting • Metallurgy • Refrigeration and Air-Conditioning. 	756	No equivalent in Training Package. Competencies in this Qualification are Currently under Development.	
9353 Associate Diploma of Engineering (Mechanical) From 1/1/2000 will be 8970Diploma in Engineering: <ul style="list-style-type: none"> • Drafting Electrical • Refrigeration and Air-Conditioning • Mechanical Engineering • Metallurgy 	1296	No equivalent currently in the Training Package. Competencies in this Qualification are Currently under Development	

Notes:

- 1 The change to the subscript titles 1,2 and 3 are dependent on the VET Act and regulations.
- 2 The subscript courses 4, 5 and 6 have been replaced in 1998 and would be used for continuing clients only.
- 3 Locksmiths, Shipwrights, Fuel Injection Fitters, Watchmaker and Jewellery will continue under their existing modular courses until the CSU's for these occupations are available.
- 4 Subscript 7, Course 3108 has been established to facilitate the delivery, assessment, recording and reporting of Short Courses in the Metals and Engineering area, based on nationally developed or endorsed modules in the Metals and Engineering Curriculum Bank, Engineering Production Bank and the Engineering Technician/Engineering Associate Bank. The course does not trigger a qualification on the completion of six (6) modules. It is used to hold the Metals and Engineering National Module bank to facilitate post trade, customised training, cross skilling and up skilling type studies to meet industry demand. Under Training Packages the "Course" will need to be retained to facilitate similar studies based on CSU's that do not necessarily lead to the issuance of an AQF qualification.
- 5 Subscript courses 8,9 & 10. Note, the hours indicated for these pre-vocational courses only relate to the nominal hours required to achieve the relevant CSU's. It is recognised however that these pre-vocational students will require additional hours of practice to achieve competency to a workplace standard. Accordingly, WADT will continue to fund these additional hours under arrangements similar to those currently utilised.

TRANSITION ARRANGEMENTS

The following arrangements will apply for accredited courses replaced by the Metals and Engineering Training Package qualifications:

- Metals and Engineering Training Package qualifications at AQF levels 1-IV are expected to be available for delivery in WA from 1/1/2000.
- Existing courses affected by the introduction of the Training Package qualifications will remain available until their accreditation expires in order that ongoing learners can continue in the course of study in which they originally enrolled.
- New learners commencing their studies in January/February 2000 should be enrolled in the new AQF qualifications, where available.
- While it may be possible to transfer some existing learners from their current courses to the new AQF courses this should be undertaken with caution and some rigour and in consultation with the learner and his/her employer. This approach is necessary because of the difference in emphasis between existing courses and the new AQF qualifications. That is, delivery based on a curriculum versus achievement of a workplace competency.
- The current Metals and Engineering Advanced Certificate and Associate Diploma Courses have recently been aligned to the AQF under AQF "Transition Arrangements". Simultaneously their names were changed to Certificate IV of Engineering and Diploma in Engineering respectively to comply with Australian Recognition Framework (ARF) requirements. However, the content remains the same and is based on existing NMEC, EA and EB modules. It is expected that the Metals and Engineering Competency Standards for these higher level qualifications will be developed and endorsed during the latter part of 1999 and 2000. Accordingly, Metals and Engineering AQF, Diploma, and Advanced Diploma courses will not be available until 2001/2002.
- Vehicle Body Building will continue under their existing modular courses until the CSUs for this occupation become available.

ASSIGNMENT OF NOMINAL HOURS TO UNITS OF COMPETENCE

Hours have been calculated on the basis of 9 hours per CSU point. That is, in a standard Certificate III trade program, the required 96 unit points equate to the currently funded 864 hours.

Note, the learner will, in most cases, require additional hours in the workplace practicing and consolidating the skills learnt. Experience suggest that in normal situations the workplace practice hours will be approximately five (5) times greater than the indicated “Nominal RTO hours”.

It is noted that many CSUs assume the attainment of other CSUs. For example, CSU 18.20A, Maintain Hydraulic System Components should not be delivered/assessed as a stand-alone CSU. Arrangements need to be in place to ensure that learners already have the skills and knowledge related to the pre-requisite CSU’s 9.1A, 9.2A, 18.1A, 18.2A, 18.3A and 18.6A.

If the learner/s was not competent in any or all of the above CSU’s then a training pathway containing the whole suite of CSU’s may need to be delivered and assessed. Accordingly, it is recommended that RTO’s carefully consider the packaging of CSU’s in these situations to ensure that learners already have all pre-requisite skills and knowledge or have the time and equipment available to achieve the CSU’s and their pre-requisite CSU’s.

It is also not possible in the Metals and Engineering area to provide a direct alignment of every NMEC module to every CSU. While there are a significant number of modules that have a 1:1 alignment with a CSU there are many of instances where between 5 and 20 modules have a full or partial alignment with a particular CSU and the alignment can vary depending on the learning pathway selected.

To assist stakeholders to make valid selections, a wide range of “Model Training Pathways” have been included in the Guide and the MERS ITAB “Metal and Engineering Competency Standards” – Map of units and related training modules” is available from the Metals, Manufacturing and Service Industry Training Council.

National Metals and Engineering Industry Competency Standards, Units of Competency

1. Foundation			Nominal Hours
Unit No.	Unit Name	Points	At RTO
MEM 1.1F	Undertake interactive workplace communication	0	1
MEM 1.2F	Apply principles of Occupational Health and Safety (OH&S) in work environment	0	1
MEM 1.3F	Apply quality procedures	0	1
MEM 1.4F	Plan to undertake a routine task	0	1

Note: Even though the Foundation Units have not been allocated any points, they have been allocated a minimum of 1 hour each to enable RTO's to assess and report on learner achievement.

2. Core			Nominal Hours
Unit No.	Unit Name	Points	At RTO
MEM 2.1C12	Apply quality systems	2	18
MEM 2.2C11	Organise and analyse information	2	18
MEM 2.3C11	Operate in a work based team environment	2	18
MEM 2.4C11	Assist in the provision of on the job training	2	18
MEM 2.5C11	Measure with graduated devices	2	18
MEM 2.6C10	Plan a complete activity	4	36
MEM 2.7C10	Perform computations – basic	2	18
MEM 2.8C10	Perform computations	2	18
MEM 2.9C10	Perform computer operations	2	18
MEM 2.10C5	Write reports	2	18
MEM 2.11C5	Research and prepare presentations and reports	2	18
MEM 2.13C5	Perform mathematical computations	4	36
MEM 2.14C5	Use graphical techniques and perform simple statistical computations	2	18
MEM 2.15C5	Operate in an autonomous team environment	2	18
MEM 2.16C5	Interpret quality specifications and manuals	4	36

3. Assembly			Nominal Hours
Unit no.	Unit name	Points	At RTO
MEM 3.1A	Manual production assembly	4	36
MEM 3.2A	Precision assembly	4	36
MEM 3.3A	Sheet and plate assembly	4	36
MEM 3.4A	Electronic/electrical assembly (production)	8	72
MEM 3.5A	Rework and repair (electrical/electronic production)	8	72
MEM 3.6A	Setting assembly stations	2	18
MEM 3.7A	Setting multistage continuous process lines	6	54

4. Castings & Moulding			Nominal Hours
Unit No	Unit name	Points	At RTO
MEM 4.1A	Operate melting furnaces	4	36
MEM 4.2A	Gravity die casing	2	18
MEM 4.3A	Operate pressure die casting machine	4	36
MEM 4.4A	Prepare and mix sand for metal moulding	4	36
MEM 4.5A	Produce moulds and cores by hand (jobbing)	16	144
MEM 4.6A	Operate sand moulding and core making machines	8	72
MEM 4.7A	Pour molten metal	4	36
MEM 4.8A	Fettle and trim metal castings/forgings	4	36
MEM 4.9A	Inspect/test castings/forgings	6	54
MEM 4.10A	Develop and manufacture wood patterns	20	180
MEM 4.11A	Produce polymer patterns	8	72
MEM 4.12A	Assemble plated patterns	8	72
MEM 4.13A	Develop and manufacture polystyrene patterns	2	18
MEM 4.14A	Develop and manufacture production patterns	8	72
MEM 4.15A	Develop and manufacture vacuum forming moulds and associated equipment	6	54
MEM 4.16A	Develop and manufacture precision models	6	54
MEM 4.17A	Develop and manufacture precision gear, conveyor screw and propeller patterns	4	36
MEM 4.18A	General woodworking machine operations	4	36
MEM 4.19A	Refractory installation and repair	4	36

5. Fabrication			Nominal Hours
Unit No.	Unit name	Points	At RTO
MEM 5.1A	Manual soldering/desoldering – electrical/electronic components	4	36
MEM 5.2A	High reliability soldering and desoldering	4	36
MEM 5.3A	Soft soldering (basic)	2	18
MEM 5.4A	Perform routine oxyacetylene welding (fuel gas welding)	2	18
MEM 5.5A	Carry out mechanical cutting	2	18
MEM 5.6A	Perform brazing and/or silver soldering	2	18
MEM 5.7A	Manual heating, thermal cutting and gouging	2	18
MEM 5.8A	Advanced manual thermal cutting, gouging and shaping	2	18
MEM 5.9A	Automated thermal cutting	2	18
MEM 5.10A	Undertake fabrication, forming, bending and shaping	8	72
MEM 5.11A	Assemble fabricated components	8	72
MEM 5.12A	Perform routine manual arc and/or gas metal arc welding	4	36
MEM 5.13A	Perform manual production welding	2	18
MEM 5.14A	Monitor quality of production welding/fabrications	2	18
MEM 5.15A	Weld using manual metal arc welding process (MMAW)	6	54
MEM 5.16A	Perform advanced welding using manual metal arc welding process (MMAW)	8	72
MEM 5.17A	Weld using gas metal arc welding process (GMAW)	6	54
MEM 5.18A	Perform advanced welding use gas metal arc welding process (GMAW)	8	72
MEM 5.19A	Weld using gas tungsten arc welding process (GTAW)	6	54
MEM 5.20A	Perform advanced welding using gas tungsten arc welding process (GTAW)	8	72
MEM 5.21A	Weld using oxyacetylene welding process (OAW) – fuel gas welding	4	36
MEM 5.22A	Perform advanced welding using oxyacetylene welding process (OAW)	8	72
MEM 5.23A	Weld using submerged arc welding process	6	54
MEM 5.24B	Perform welding supervision	12	108
MEM 5.25B	Perform welding/fabrication inspection	12	108
MEM 5.26A	Apply welding principles	4	36
MEM 5.36A	Repair/replace/modify fabrications	4	36
MEM 5.37A	Geometric development	6	54

MEM 5.38A	Advanced geometric development – Cylindrical/Rectangular	2	18
MEM 5.39A	Advanced geometric development – Conical	2	18
MEM 5.40A	Advanced geometric development – Transitions	4	36
MEM 5.41A	Weld using powder flame spraying	4	36

6. Forging			Nominal Hours
Unit No.	Unit name	Points	At RTO
MEM 6.1A	Hand forging	4	36
MEM 6.2A	Hammer forging	4	36
MEM 6.3A	Carry out heat treatment	6	54
MEM 6.4A	Select heat treatment processes and test finished product	6	54
MEM 6.5A	Drop and upset forging	4	36
MEM 6.6A	Spring repair	4	36
MEM 6.7A	Perform basic incidental heat/quenching, tempering and annealing	2	18

7. Machine & Process Operations			Nominal Hours
Unit No	Unit name	Points	At RTO
MEM 7.1A	Operational maintenance of machines/equipment	2	18
MEM 7.2A	Perform precision shaping/planing/slotting operations	4	36
MEM 7.3A	Setting machines (routine)	4	36
MEM 7.4A	Setting machines (complex)	8	72
MEM 7.5A	Perform general machining	8	72
MEM 7.6A	Perform lathe operations	4	36
MEM 7.7A	Perform milling operations	4	36
MEM 7.8A	Perform grinding operations	4	36
MEM 7.9A	Perform precision jig boring operations	4	36
MEM 7.10A	Perform tool and cutter grinding operations	4	36
MEM 7.11A	Complex milling operations	4	36
MEM 7.12A	Complex grinding operations	4	36
MEM 7.13A	Perform machining operations using horizontal and/or vertical boring machine	4	36

MEM 7.14A	Perform electro-discharge (EDM) machining operations	4	36
MEM 7.15A	Set NC/CNC machines/process (basic)	2	18
MEM 7.16A	** Set and edit NC/CNC machine/process	4	36
MEM 7.18A	** Basic NC/CNC programming	4	36
MEM 7.19A	** Program NC/CNC machining centre	2	18
MEM 7.20A	** Program multiple spindle and/or multiple axis NC/CNC machining centre	2	18
MEM 7.21A	Perform complex lathe operations	4	36
MEM 7.22A	** Advanced programming CNC wire cut machines	2	18
MEM 7.23B	Program and set up CNC manufacturing cell	6	54
MEM 7.24A	Operate and monitor machine/process	4	36
MEM 7.25A	Advanced machine/process operation	6	54
MEM 7.26A	Advanced plastic processing	6	54
MEM 7.27A	Advanced press operations	6	54
MEM 7.28A	Operate NC/CNC machine/process (basic)	2	18
MEM 7.29A	Perform routine sharpening/maintenance of production tools and cutters	4	36
MEM 7.30A	Perform metal spinning lathe operations (basic)	6	54
MEM 7.31A	Perform metal spinning lathe operations (complex)	4	36
MEM 7.32A	Use workshop machines for basic operations	2	18
MEM 7.33A	Operate and monitor basic boiler	6	54

8. Surface Finishing			Nominal Hours
Unit No.	Unit name	Points	At RTO
MEM 8.1 A	Wire, jig and barrel load/unload work	4	36
MEM 8.2A	Pre-treat work for subsequent surface coating	4	36
MEM 8.3A	Finish work using acidic/alkaline electroplating solutions	20	180
MEM 8.4A	Finish work using wet, dry and vapour deposition methods	4	36
MEM 8.5A	Prepare and produce specialised coatings electrolytically	4	36
MEM 8.6A	Produce clear and/or coloured and/or sealed anodised films on aluminium	2	18
MEM 8.7A	Control surface finish production and finished product quality	4	36

MEM 8.8A	Operate and control surface finishing waste treatment process	3	27
MEM 8.9A	Maintain basic solutions	2	18
MEM 8.10A	Manually finish/polish materials	6	54
MEM 8.11A	Undertake surface preparation using solvents and/or mechanical means	2	18
MEM 8.12A	Prepare surfaces by abrasive blasting (basic)	4	36
MEM 8.13A	Prepare surfaces by abrasive blasting (advanced)	4	36
MEM 8.14A	Apply protective coatings (basic)	4	36
MEM 8.15A	Apply protective coatings (advanced)	4	36
MEM 8.16A	Control blast coating by- products materials and emissions	1	9

9. Drawing, Drafting & Design			Nominal Hours
Unit No.	Unit name	Points	At RTO
MEM 9.1A	Draw and interpret sketch	2	18
MEM 9.2A	Interpret technical drawing	4	36
MEM 9.3A	Prepare basic engineering drawing	8	72
MEM 9.4B	Electrical/electronic detail drafting	8	72
MEM 9.5A	Basic engineering detail drafting	8	72
MEM 9.6B	Advanced engineering detail drafting	4	36
MEM 9.7B	Advanced mechanical detail drafting	4	36
MEM 9.8B	Advanced structural detail drafting	4	36
MEM 9.9B	Create 2D drawings using computer aided design system	8	72
MEM 9.10B	Create 3D models using computer aided design system	4	36
MEM 9.11A	Apply basic engineering design concepts	6	54

10. Installation & Commissioning			Nominal Hours
Unit No.	Unit name	Points	At RTO
MEM 10.1A	Erect structures	4	36
MEM 10.2A	Terminate and connect electrical wiring	3	27
MEM 10.3A	Install and test electrical wiring and circuits (up to 1000 volts AC and 1500 volts DC)	8	72
MEM 10.4A	Enter and change programmable controller operational parameters	2	18

MEM 10.5A	Commission programmable controller programs	4	36
MEM 10.6A	Install machine/plant	4	36
MEM 10.7B	Modification of control systems	6	54
MEM 10.8B	Undertake commissioning procedures for plant and/or equipment	4	36
MEM 10.9A	Install refrigeration and air conditioning plant and equipment	4	36
MEM 10.10A	Install pipework and pipework assemblies	4	36
MEM 10.11A	Terminate and connect specialist cables	2	18

11. Materials & Handling			Nominal Hours
Unit No.	Unit name	Points	At RTO
MEM 11.1A	Erect/dismantle scaffolding and equipment	4	36
MEM 11.2A	Erect/dismantle complex scaffolding and equipment	4	36
MEM 11.3A	Coordinate erection/dismantling of complex scaffolding/equipment	4	36
MEM 11.4A	Undertake dogging/crane chasing	4	36
MEM 11.5A	Pick and process order	4	36
MEM 11.6A	Production packing	2	18
MEM 11.7A	Administer inventory procedures	4	36
MEM 11.8A	Package materials (stores and warehouse)	2	18
MEM 11.9A	Handle/move bulk fluids/gases	4	36
MEM 11.10A	Operate mobile load shifting equipment	4	36
MEM 11.11A	Manual Handling	2	18
MEM 11.12A	Purchase materials	6	54
MEM 11.13A	Undertake warehouse receival process	4	36
MEM 11.14A	Undertake warehouse dispatch process	4	36
MEM 11.15A	Manage warehouse inventory system	6	54
MEM 11.16A	Order materials	2	18
MEM 11.17A	Organise and lead stocktakes	4	36
MEM 11.18A	Organise and maintain warehouse stock receival and/or dispatch system	6	54
MEM 11.19A	Undertake tool store procedures	4	36
MEM 11.20A	Perform advanced warehouse computer operations	4	36
MEM 11.21A	Advanced operation of load shifting equipment	2	18
MEM 11.22A	Operate fixed/moveable load shifting equipment	4	36

12. Measurement			Nominal Hours
Unit No.	Unit name	Points	At RTO
MEM 12.1A	Use comparison and basic measuring devices	2	18
MEM 12.2A	Electrical/electronic measurement	2	18
MEM 12.3A	** Precision mechanical measurement	2	18
MEM 12.4A	** Precision electrical/electronic measurement	4	36
MEM 12.5B	Calibrating measuring equipment	6	54
MEM 12.6A	Mark off/out (general engineering)	4	36
MEM 12.7A	Mark off/out structural fabrications and shapes	4	36
NOTE: ** This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit for progression to C7 (AQF level IV)			

13. Occupational Health & Safety			Nominal Hours
Unit No.	Unit name	Points	At RTO
MEM 13.1A	Perform emergency first aid	1	9
MEM 13.2A	Undertake OHS – Occupational Health & Safety activities in the workplace	3	27
MEM 13.3A	Work safely with industrial chemicals and materials	2	18
MEM 13.4A	Work safely with molten metals/glass	2	18
MEM 13.5B	Manage OHS – Occupational Health & Safety for a workplace or section of a workplace	12	108
MEM 13.6A	Monitor OHS – Occupational Health & Safety factors for enterprise or section of enterprise	4	36
MEM 13.7A	Maintain water cooling towers and treatment systems	2	18

14. Planning			Nominal Hours
Unit No.	Unit name	Points	At RTO
MEM 14.1B	Schedule material deliveries	8	72
MEM 14.2B	Basic process planning	8	72
MEM 14.3B	Undertake basic production scheduling	8	72

15. Quality			Nominal Hours
Unit No.	Unit name	Points	At RTO
MEM 15.1A	Performs basic statistical quality control	2	18
MEM 15.3A	Use improvement processes in team activities	4	36
MEM 15.4A	Perform inspection (basic)	2	18
MEM 15.5A	Perform inspection (advanced)	4	36
MEM 15.7B	Conduct product and/or process capability studies	6	54
MEM 15.8B	Perform advanced statistical quality control	2	18
MEM 15.10B	Perform laboratory procedures	8	72
MEM 15.11B	Exercise external quality assurance	6	54
MEM 15.12B	Maintain/supervise application of quality procedures	4	36

16. Communication			Nominal Hours
Unit No.	Unit name	Points	At RTO
MEM 16.1B	Give formal presentations and take part in meetings	2	18
MEM 16.2A	Participate in formal interviews and/or negotiations	4	36
MEM 16.3B	Advanced customer service	2	18
MEM 16.4A	Perform internal/external customer service	2	18

17. Training			Nominal Hours
Unit No.	Unit name	Points	At RTO
MEM 17.1A	*Assist in development and deliver training in the workplace	2	18
MEM 17.2A	*Conduct workplace assessment	2	18

18. Maintenance & Diagnostics			Nominal Hours
Unit No.	Unit name	Points	At RTO
MEM 18.1A	Use hand tools	2	18
MEM 18.2A	Use power tools/hand held operations	2	18
MEM 18.3A	Use tools for precision work	4	36
MEM 18.4A	Maintain and overhaul mechanical equipment	4	36
MEM 18.5A	Bearing – fault diagnosis installation and removal	4	36
MEM 18.6A	Dismantle/repair/replace/assemble and fit engineering components	6	54
MEM 18.7A	Maintain and repair mechanical drives and mechanical transmission assemblies	4	36
MEM 18.8A	Balance equipment	2	18
MEM 18.9A	Levelling and alignment of machines and engineering components	4	36
MEM 18.10A	*Equipment condition monitoring and recording	4	36
MEM 18.11A	**Shut down/isolate machines/equipment	2	18
MEM 18.12A	Mechanical seal – installation and removal	2	18
MEM 18.13A	Gland packing	2	18
MEM 18.14A	Tool, gauge and die manufacture	8	72
MEM 18.15A	Tool and die maintenance	4	36
MEM 18.16B	Analyse plant and equipment condition monitoring results	4	36
MEM 18.17B	Modify mechanical systems and equipment	8	72
MEM 18.18A	Maintain pneumatic system components	4	36
MEM 18.19A	*Maintain and repair pneumatic systems	4	36
MEM 18.20A	Maintain hydraulic system components	4	36
MEM 18.21A	*Maintain and repair hydraulic systems	4	36
MEM 18.22A	*Maintain/repair/replace fluid power controls	8	72
MEM 18.23B	Modify fluid power system operation	8	72

MEM 18.24A	Maintain and repair engine cooling systems	2	18
MEM 18.25A	Service combustion engines	2	18
MEM 18.26A	Maintain compression ignition fuel systems	8	72
MEM 18.27A	Overhaul engine fuel system components	8	72
MEM 18.28A	Maintain and repair engine lubrication systems	2	18
MEM 18.29A	Tune diesel engine	4	36
MEM 18.30A	Diagnose and repair low voltage election systems	8	72
MEM 18.31A	Diagnose and repair low voltage starting systems	2	18
MEM 18.32A	Maintain and repair induction/exhaust systems	4	36
MEM 18.33A	Perform engine bottom-end overhaul	4	36
MEM 18.34A	Perform engine top-end overhaul	8	72
MEM 18.35A	Diagnose and repair braking systems	6	54
MEM 18.36B	Maintain and repair scientific analysis equipment	10	90
MEM 18.37A	Diagnose and repair low voltage charging systems	2	18
MEM 18.38A	Maintain and repair wheels and tyres	2	18
MEM 18.39A	Diagnose and repair track type undercarriage	4	36
MEM 18.40A	Maintain and repair suspension systems	4	36
MEM 18.41A	Maintain and repair steering systems	4	36
MEM 18.42A	Diagnose and repair manual transmissions	4	36
MEM 18.43A	Diagnose and repair automatic transmissions	8	72
MEM 18.44A	Diagnose and repair drive line and final drives	4	36
MEM 18.45A	Fault find/repair AC and DC electrical equipment/components which use up to 240 volts single phase supply (non interconnected)	4	36
MEM 18.46A	Fault find/repair AC and DC electrical equipment, which use up to 1000 volts AC or 1500 volts DC single phase supply (non interconnected)	6	54
MEM 18.48A	Fault find and repair/rectify basic electrical circuits	10	90
MEM 18.49A	** Disconnect/reconnect fixed wired equipment (up to 1000 volts AC and 1500 volts DC)	3	27
MEM 18.50A	** Disconnect/reconnect fixed wire equipment (over 1000 volts AC and 1500 volts DC)	3	27

MEM 18.51A	*Fault find and repair/rectify complex interconnected electrical circuits	6	54
MEM 18.53B	Modify fluid power control systems	6	54
MEM 18.54A	**Fault-find, test, calibrate instrumentation systems, equipment	8	72
MEM 18.55A	Dismantle, replace and assemble engineering components	3	27
MEM 18.56A	**Diagnose and repair analog equipment and components	10	90
MEM 18.57A	Maintain/service analog/digital electronic equipment	6	54
MEM 18.58A	*Modify electronic equipment	4	36
MEM 18.59B	Modify electronic systems	4	36
MEM 18.60A	*Maintain, repair control instrumentation – single and multiple loop control systems	8	72
MEM 18.61B	Maintain/calibrate complex control systems	8	72
MEM 18.62A	**Install, maintain and calibrate instrumentation sensors, transmitters and final control elements	8	72
MEM 18.63A	Terminate signal and data cables	4	36
MEM 18.65A	**Diagnose and repair digital equipment and components	10	90
MEM 18.66A	*Diagnose and repair microprocessor based equipment	6	54
MEM 18.67A	*Tune control loops – multi controller or multi element systems	6	54
MEM 18.69B	Maintain, repair instrumentation process control analysers	6	54
MEM 18.70B	Modify complex electrical circuits and systems	6	54
MEM 18.86A	Test, evacuate and charge refrigeration systems	4	36
MEM 18.87A	Service and repair domestic and light commercial refrigeration and air conditioning equipment	6	54
MEM 18.88A	Maintain and repair commercial air conditioning systems and components	4	36
MEM 18.89A	Maintain and repair large central air handling systems	6	54
MEM 18.90A	Maintain and repair industrial refrigeration systems and components	6	54
MEM 18.91A	*Maintain and repair multi stage cascade, and/or ultra-cold industrial refrigeration systems	4	36
MEM 18.92A	**Maintain and repair commercial and/or industrial refrigeration and/or air conditioning controls	6	54
MEM 18.93B	Maintain and repair integrated industrial refrigeration and/or large air handling system controls	8	72

MODEL TRAINING PATHWAYS

The requirements for packaging units of competence to form qualifications are outlined on pages 15-20 of the Metals and Engineering Training Package (MEM 98) Policy Document. The requirements provide information on, for example:

- The Foundation and Core Units for each Qualification Level.
- The selection of Specialist Units for each Qualification level and field (Skill area).

Similarly, guidelines for the customisation of Metals and Engineering Qualifications are described on pages 5-7 of the Policy Document.

Details of Pre-requisite Units of Competence are located at the top left-hand corner of each Unit of Competence described in the Metals and Engineering Competency Standards.

Note, that for Certificate III trade courses, RTO's need to ensure that the equivalent of 24 National Metals modules are provided as part of the learning strategy to meet the requirements of the Metal Trades (General) Award. Refer pages 15-16 of the MMSITC "The Steps" document.

Following is a variety of example or model training pathways. They have been developed to illustrate how units of competence can be combined into qualifications and National Metals modules selected to provide a relevant learning strategy. The models presented are not intended to be prescriptive. They represent hypothetical job descriptions/skill requirements. In actual situations the CSU's and/or the modules would be identified by an employer and an RTO for the training of an employee.

In situations where unemployed and/or learners not employed in the Metals and Engineering area are seeking a Qualification to assist them to gain employment, eg Pre Vocational and Diploma level Qualifications, the models could represent a "typical course" provided by an RTO.

It must be stressed that in all the Model Training Pathways presented, other CSU's and/or modules could have been selected to reach the same endpoint. In actual situations the CSU's selected and the learning strategy adopted will be dependant on the skills required, the equipment available in the on and off the workplace environments, the expertise of the training staff and the existing skills and knowledge of the learner.

The following Models are provided:

1. Certificate I in Engineering - Production
Occupation: Entry Level
2. Certificate II in Engineering – Production Technology
Occupation: Foundry Worker

3. Certificate II in Engineering – Production Technology
Occupation: Engineering Office Assistant
4. Certificate III in Engineering – Mechanical
Occupation: Mechanical Fitter
5. Certificate III in Engineering – Mechanical
Occupation: Machinist
6. Certificate III in Engineering – Mechanical
Occupation: Fitter Machinist
7. Certificate III in Engineering – Mechanical
Occupation: Fluid Power
8. Certificate III in Engineering – Fabrication
Occupation: Aluminium Shipbuilder
9. Certificate III in Engineering – Fabrication
Occupation: Boilermaker
10. Certificate III in Engineering – Fabrication
Occupation: Sheetmetal Worker
11. Certificate III in Engineering – Electrical/Electronic
Occupation: Air conditioning
12. Certificate III in Engineering - Electrical/Electronic
Occupation: Refrigeration
13. Certificate III in Engineering (Electrical)
Occupation: Engineering Tradesperson (Electrical)
 - Learning Strategy Pathway A
 - Learning Strategy Pathway B
 - Learning Strategy Pathway C
 - Learning Strategy Pathway D
14. Certificate IV in Engineering – Higher Engineering Trade
(Fluid Power)
Occupation: Fluid Power Technician
15. Certificate IV in Engineering – Higher Engineering Trade
(Welding)
Occupation: Welding Inspector/Supervisor

MODEL 1

AQF QUALIFICATION : **CERTIFICATE I IN ENGINEERING - PRODUCTION
MEM 10198**
OCCUPATION : **ENTRY LEVEL**

Unit Code	Unit Name	Points
1.1F	Interactive Workplace Communication	0
1.2F	Occupational Health and Safety in the Work Environment	0
1.3F	Apply Quality Procedures	0
1.4F	Plan to Undertake a Routine Task	0
2.1C 12	Apply Quality Systems	2*
2.5C 12	Measure With Graduated Devices	2
2.7C 10	Perform Computations – Basic	2
3.1A	Manual Production Assembly	4
9.1A	Draw and Interpret Sketch	2
18.1A	Use Hand Tools	2
18.2A	Use Power Tools/Hand Held Operations	2
TOTAL		16

*Denotes Compulsory Core CSU

RECOMMENDED LEARNING STRATEGY TO ACHIEVE ABOVE CSU'S.

Module Code	Module Title	Module Equivalence
NBB00	Introduction to work planning	1
NBB01	Communication and Industrial Relations	1
NBB02	Occupational Health and Safety	0.5
NBB05	Quality concepts	0.5
MEC017	Manual production assembly	1
MEC072	Hand Tools	0.5
MEC073	Power Tools	0.5
MEC 074	Engineering Calculations	1
MEC075	Produce and Interpret engineering sketches	0.5
EPC 087	Measurement Introduction	1
TOTAL		7.5

MODEL 2

**AQF QUALIFICATION : CERTIFICATE II IN ENGINEERING -
MEM 20298 PRODUCTION TECHNOLOGY**

OCCUPATION : FOUNDRY WORKER

Unit Code	Unit Name	Points
1.1F	Interactive Workplace Communication	0
1.2F	Occupational Health and Safety in work environment	0
1.3F	Quality Procedures	0
1.4F	Plan to undertake a routine task	0
2.1C 12	Apply quality systems	2*
2.2C 11	Organise and analyse information	2*
2.3C 11	Operate in a work base team environment	2*
2.5C 11	Measure with graduated devices	2*
2.6C 10	Plan a complete activity	4
2.7C 10	Perform computations – basic	2
2.8C 10	Perform Computations	2
4.1A	Operate furnaces	4
4.7A	Pour liquid metal	4
4.9A	Inspect castings	4
5.7A	Manual heating, thermal cutting and gouging	2
9.2A	Interpret technical drawings	4
11.10A	Operate load shifting equipment	4
11.11A	Manual handling	2
11.22A	Operate fixed/moveable load shifting equipment	4
13.1A	Perform emergency first aid	1
13.2A	Undertake OH & S activities in Workplace	3
13.3A	Work safety with industrial chemicals and materials	2
13.4A	Work safety with molten glass/metal	2
15.4A	Perform inspection – basic	2
15.5A	Perform inspection – advanced	4
18.A	Use hand tools	2
18.2A	Use hand held power tools	2
TOTAL		64

*Denotes Compulsory Core CSU's

MODEL 2

AQF QUALIFICATION : **CERTIFICATE II IN ENGINEERING -
MEM 20298** **PRODUCTION TECHNOLOGY**

OCCUPATION : **FOUNDRY WORKER**

RECOMMENDED LEARNING STRATEGY TO ACHIEVE ABOVE CSU's

Model Code	Module Title	Module Equivalence
NBB000	Introduction to Workplace Planning	1
NBB01	Communication and Industrial relations	1
NBB02	Occupational health and Safety	0.5
NBB05	Quality concepts	0.5
NBB09	Welding and Thermal Cutting	1
EPC 84	Workplace safety	1
EPC 087	Measurement Introduction	1
EPC 89	Forklift – safety and operations	1
EPC 90	Scrap processing	0.5
EPC126	Quality Practice 1- TQM Application	0.5
EPC 127	Production inspection	1
EPC 144	Die casting – melting/molten metal handling	1
EPC 152	Rigging introduction	0.5
EPC 189	First Aid	0.5
EPC 198	Goods packaging	1
MEC 072	Hand Tools	0.5
MEC 073	Power Tools	0.5
MEC 074	Engineering Calculations	1
MEC 076	Engineering Drawing Interpretations	1
NV 04	Job planning and execution	1
	TOTAL	16

MODEL 3

**AQF QUALIFICATION : CERTIFICATE II IN ENGINEERING -
MEM 20298 PRODUCTION TECHNOLOGY**

OCCUPATION : ENGINEERING OFFICE ASSISTANT

Unit Code	Unit Name	Points
1.1F	Interactive Workplace Communication	0
1.2F	Apply Occupational Health and Safety in the workplace	0
1.3F	Apply Quality Procedures	0
1.4F	Plan a routine task	0
2.1C 12	Apply quality systems	2*
2.2C 11	Organise and analyse information	2*
2.3C 11	Operate in a work base team environment	2*
2.4C11	Assist in the Provision of On-The-Job-Training	2*
2.5C 11	Measure with graduated devices	2*
2.6C 10	Plan a complete activity	4
2.7C 10	Perform computations – basic	2
2.9C 10	Perform Computer operations	2
3.1A	Manual Production Assembly	4
3.7A	Setting multi-stage continuous process line	6
5.5A	Carry out mechanical cutting	2
7.1A	Operational Maintenance	2
7.5A	General Machining	8
9.1A	Produce and Interpret Engineering Sketches	2
9.2A	Engineering Drawing Interpretation	2
9.3A	Prepare Basic Drawing	8
9.5A	Basic Engineering Detail Drafting	8
11.7A	Administer Inventory Procedures	4
TOTAL		64

*Denotes Compulsory Core CSU's

MODEL 3

AQF QUALIFICATION : **CERTIFICATE II IN ENGINEERING
MEM 20298** **PRODUCTION TECHNOLOGY**

OCCUPATION : **ENGINEERING OFFICE ASSISTANT**

RECOMMENDED LEARNING STRATEGY TO ACHIEVE ABOVE CSU's

Model Code	Module Title	Module Equivalence
NCS001	Workplace Communication	1
NCS004	Workteam Communication	1
NBB00	Introduction to Workplace Planning	1
NBB01	Communication and Industrial relations	1
NBB02	Occupational Health and Safety	0.5
NBB04	Computers in Engineering	1
NBB05	Quality concepts	0.5
NBB06	Machining	1
NBB10	Fabrication Techniques 1	1
NV04	Job Planning and Execution	1
EPC05	Production Training 1	1
EPC019	Inventory Control	1
EPC087	Measurement Introduction	1
EA061	Engineering Graphics	1
MEC 072	Hand Tools	0.5
MEC 074	Engineering Calculations 1	1
MEC075	Drawing & Interpretation Engineering Sketches	0.5
MEC 076	Engineering Drawing Interpretation I	1.0
	TOTAL	16

MODEL 4

AQF QUALIFICATION : CERTIFICATE III IN ENGINEERING
MEM 30298 - MECHANICAL TRADE
OCCUPATION : MECHANICAL FITTER

Unit code	Unit name	Points
1.1F	Interactive Workplace Communication	0
1.2F	Occupational Health and Safety (OH&S) in work environment	0
1.3F	Quality Procedures	0
1.4F	Plan to Undertake a Routine Task	0
2.1C12	Apply Quality Systems	2*
2.2C11	Organise and Analyse Information	2*
2.3C11	Operate in a Work Based Team Environment	2*
2.4C11	Assist in the provision of On-The-Job Training	2*
2.5C11	Measure with Graduated Devices	2*
2.6C10	Plan a Complete Activity	4*
2.7C10	Perform Computations – Basic	2*
2.8C10	Perform Computations	2*
2.9C10	Perform Computer Operations	2*
2.13C	Perform Mathematical Computations	4
5.7A	Manual Heating, Thermal Cutting & Goughing	2
7.1A	Operational Maintenance	2
7.5A	General Machining	8
7.6A	Lathe Operations	4
7.7A	Milling Operations	4
9.1A	Draw and Interpret Sketch	2
9.2A	Interpret Technical Drawings	4
9.3A	Prepare Basic Engineering Drawings	8
18.1A	Use Hand Tools	2
18.2A	Use Power Tools	2
18.3A	Use tools for Precision Work	4
18.5A	Bearing Fault Diagnosis	4
18.8A	Balance Equipment	2
18.9A	Level and Align Machines and Equipment	4
18.12A	Mechanical Seals	2
18.13A	Gland Packing	2
18.4A	Maintain & Overhaul Mechanical Equipment	4
18.6A	Dismantle/Repair/Replace/Assemble Eng. Components	6
18.7A	Maintain & Repair Drives and Transmissions	4
18.18A	Maintain Pneumatic System Components	4
18.55A	Dismantle, Replace and Assemble Eng. Equipment	3
	TOTAL	101

*Denotes Compulsory Core CSU's

MODEL 4

AQF QUALIFICATION : **CERTIFICATE III IN ENGINEERING**
MEM 30298 : **- MECHANICAL TRADE**
OCCUPATION : **MECHANICAL FITTER**

RECOMMENDED LEARNING STRATEGY TO ACHIEVE THE ABOVE CSU'S

Module Code	Module Title	Module Equivalence
NBB000	Introduction to Work Planning	1.0
NBB001	Communications & Industrial Relations	1.0
NBB02	Occupational Health & Safety	0.5
MEC072	Hand Tools	0.5
MEC073	Power Tools	0.5
MEC074	Engineering Calculations 1 Calculations	1.0
NBB06	Machining	1.0
MEC075	Produce/Interpret Eng. Sketches	0.5
MEC076	Drawing Interpretation 1	1.0
NM19	Offhand Tool Grinding	0.5
NM25	Turning 1	1.0
NM05	Engineering Calculations	1.0
NM26	Turning 2	1.0
NM01	Milling 1	1.0
NM44	Drawing Interpretation 2	1.0
NF15	Materials Science	1.0
NBB11	Mechanical Components	1.0
NM15	Fitting Techniques 1	1.0
MEC108	Bearings & Seals	1.5
MEC109	Balancing, Levelling & Aligning	1.0
NM29	Power Transmission	1.0
NM30	Fluid Power	1.5
NM42	Water Pumping	*1.0
NM31**	Pneumatics 1	*1.0
NM32**	Hydraulics 1 (**Any 2 off)	*1.0
NM43**	Pumps Application/Maintenance	*1.0
NBB09	Welding & Thermal Cutting	1.0
	TOTAL	24

MODEL 5

**AQF QUALIFICATION : CERTIFICATE III IN ENGINEERING
MEM 30298 MECHANICAL TRADE**

OCCUPATION : MACHINIST

Unit code	Unit Name	Points
1.1F	Interactive Workplace Communication	0
1.2F	Occupational Health and Safety (OH&S) in work environment	0
1.3F	Quality Procedures	0
1.4F	Plan to Undertake a Routine Task	0
2.1C12	Apply Quality Systems	2*
2.2C11	Organise and Analyse Information	2*
2.3C11	Operate in a Work Based Team Environment	2*
2.4C11	Assist in the provision of On-The-Job Training	2*
2.5C11	Measure with Graduated Devices	2*
2.6C10	Plan a Complete Activity	4*
2.7C10	Perform Computations – Basic	2*
2.8C10	Perform Computations	2*
2.9C10	Perform Computer Operations	2*
2.13C	Perform Mathematical Computations	4
7.1A	Operational Maintenance	2
7.5A	General Machining	8
7.6A	Lathe Operations	4
7.7A	Milling Operations	4
7.8A	Grinding Operations	4
7.11A	Complex Milling	4
7.15A	Set NC/CNC Machines/Processes (Basic)	2
7.18A	Basic CNC Programming	4
7.28A	Operate CNC Machines (Basic)	2
6.3A	Carry Out Heat Treatment	6
6.4A	Select Heat Treatment	6
9.1A	Draw & Interpret Sketch	2
9.2A	Interpret Technical Drawing	4
9.3A	Prepare Basic Engineering Drawing	8
7.21A	Complex Lathe Operations	4
18.1A	Use Hand Tools	2
18.2A	Use Power Tools	2
18.3A	Use Tools for Precision Work	4
	TOTAL	96

***Denotes Compulsory Core CSU's**

MODEL 5

AQF QUALIFICATION : **CERTIFICATE III IN ENGINEERING**
MEM 30298 : **- MECHANICAL TRADE**

OCCUPATION : **MACHINIST**

RECOMMENDED LEARNING STRATEGY TO ACHIEVE ABOVE CSU'S

Module Code	Module Title	Module Equivalence
NBB000	Introduction to Work Planning	1.0
NBB001	Communications & Industrial Relations	1.0
NBB02	Occupational Health & Safety	0.5
NBB06	Machining	1.0
NBB11	Mechanical Components	1.0
MEC072	Hand Tools	0.5
MEC073	Power Tools	0.5
MEC074	Engineering Calculations 1	1.0
MEC075	Produce/Interpret Eng. Sketches	0.5
MEC076	Drawing Interpretation 1	1.0
NM07	Principles of Machining	1.0
NM25	Turning 1	1.0
NM05	Engineering Calculations	1.0
NM26	Turning 2	1.0
NM01	Milling 1	1.0
NM44	Drawing Interpretation	1.0
NF15	Materials Science	1.0
NM15	Fitting Techniques 1	1.0
NM27	Turning 3	1.0
NM24	Turning 4	1.0
NM02	Milling 2	1.0
NM03	Milling 3	1.0
NM09	CNC Machining	1.5
NM17	Surface Grinding	1.0
NM18 **	Cylindrical Grinding (**Select one)	1.0
NM20 **	CNC Machining	1.5
	TOTAL	24

MODEL 6

**AQF QUALIFICATION : CERTIFICATE III IN ENGINEERING
MEM 30298 MECHANICAL TRADE**

OCCUPATION : FITTER MACHINIST

Unit Code	Unit Name	Points
1.1F	Interactive Workplace Communication	0
1.2F	Principles of Occupational Health and Safety (OH&S) in work environment	0
1.3F	Quality Procedures	0
1.4F	Plan to Undertake a Routine Task	0
2.1C1	Apply Quality Systems	2*
2.2C1	Organise and Analyse Information	2*
2.3C1	Operate in a Work Based Team Environment	2*
2.4C1	Assist in the provision of On-The-Job Training	2*
2.5C1	Measure with Graduated Devices	2*
2.6C1	Plan a Complete Activity	4*
2.7C1	Perform Computations – Basic	2*
2.8C1	Perform Computations	2*
2.9C1	Perform Computer Operation	2*
2.13C	Perform Mathematical Computations	4
5.4A	Perform Routine Oxy Acetylene Welding	2
5.7A	Manual Heating, Thermal Cutting & Gouging	2
7.1A	Operational Maintenance	2
7.5A	General Machining	8
7.6A	Perform Lathe Operations	4
7.7A	Milling Operations	4
9.1A	Draw & Interpret Sketch	2
9.2A	Interpret Technical Drawing	4
9.3A	Prepare Basic Engineering Drawings	8
18.1A	Use Hand Tools	2
18.2A	Use Power Tools	2
18.3A	Use Tools for Precision Work	4
18.4A	Maintain/Overhaul Mechanical Equipment	4
18.5A	Bearing Fault Diagnosis	4
18.6A	Dismantle, Repair, Replace, Assemble Mechanical Components	6
18.7A	Maintain/Repair Drives/Transmissions	4
18.9A	Levelling and Alignment of Machines and Engineering Components	4
18.12A	Mechanical Seals	2
18.13A	Gland Packing	2
18.55A	Dismantle, Repair and Assemble Engineering Components	3
	TOTAL	97

***Denotes Compulsory Core CSU's**

MODEL 6

AQF QUALIFICATION : **CERTIFICATE III IN ENGINEERING**
MEM 30298 : **MECHANICAL TRADE**
OCCUPATION : **FITTER MACHINIST**

RECOMMENDED LEARNING STRATEGY TO ACHIEVE ABOVE CSU'S

Module Code	Module Title	Module Equivalence
EPC87	Measurement Introduction	1.0
MEC072	Hand Tools	0.5
MEC073	Power Tools	0.5
MEC074	Engineering Calculations 1	1.0
MEC075	Produce/Interpret Eng. Sketches	0.5
MEC076	Engineering Drawing Interpretation 1	1.0
MEC080	Maintenance of Engineering Components	1.0
MEC108	Bearings & Seals	2.0
MEC109	Balancing, Levelling and Alignment	1.0
NBB000	Introduction to Work Planning	1.0
NBB04	Computing in Engineering	1.0
NBB06	Machining	1.0
NBB09	Welding & Thermal Cutting	1.0
NBB11	Mechanical Components	1.0
NM01	Milling 1 – Routine Operations	1.0
NM02	Milling 2	1.0
NM05	Engineering Calculations	1.0
NM07	Principles of Machining	1.0
NM15	Fitting Techniques 1	1.0
NM19	Offhand Tool Grinding	0.5
NM21	Precision Measurement	1.0
NM25	Turning 1	1.0
NM26	Turning 2	1.0
NM27 **	Turning 3 (Select one)	1.0
NM29 **	Power Transmission	1.0
NM44	Drawing Interpretation 2	1.0
	TOTAL	24.0

MODEL 7

AQF QUALIFICATION : CERTIFICATE III IN ENGINEERING
MEM 30298 - MECHANICAL TRADE
OCCUPATION : FLUID POWER

Unit code	Unit name	Points
1.1F	Interactive Workplace Communication	0
1.2F	Occupational Health and Safety (OH&S) in work environment	0
1.3F	Quality Procedures	0
1.4F	Plan to Undertake a Routine Task	0
2.1C12	Apply Quality Systems	2*
2.2C11	Organise and Analyse Information	2*
2.3C11	Operate in a Work Based Team Environment	2*
2.4C11	Assist in the provision of On-The-Job Training	2*
2.5C11	Measure with Graduated Devices	2*
2.6C10	Plan a Complete Activity	4*
2.7C10	Perform Computations – Basic	2*
2.8C10	Perform Computations	2*
2.9C10	Perform Computer Operations	2*
2.13C	Perform Mathematical Computations	4
7.1A	Operational Maintenance	2
7.5A	General Machining	8
9.1A	Draw and Interpret Sketch	2
9.2A	Interpret Technical Drawings	4
9.3A	Prepare Basic Engineering Drawings	8
9.5A	Basic Engineering Detail Drafting	8
18.1A	Use Hand Tools	2
18.2A	Use Power Tools	2
18.3A	Use Tools for Precision Work	4
18.4A	Maintain and Overhaul Mechanical Equipment	4
18.5A	Bearing Fault Diagnosis & Installation	4
18.6A	Dismantle/Repair/Replace/Assemble Eng. Components	6
18.7A	Maintain & Repair Mechanical Drives/Transmissions	4
18.9A	Levelling and alignment of Machines and Engineering Components	4
18.11A	Isolate/Shutdown Machines/Equipment	2
18.12A	Install & Remove Mechanical Seals	2
18.18A	Maintain Pneumatic System Components	4
18.20A	Maintain Hydraulic System Components	4
18.55A	Dismantle, replace, and assemble engineering components	3
	TOTAL	101

*Denotes Compulsory Core CSU's

MODEL 7

AQF QUALIFICATION : **CERTIFICATE III IN ENGINEERING**
MEM 30398 : **- MECHANICAL TRADE**

OCCUPATION : **FLUID POWER**

RECOMMENDED LEARNING STRATEGY TO ACHIEVE ABOVE CSU'S

Module Code	Module Title	Module Equivalence
NBB000	Introduction to Work Planning	1.0
NBB001	Communications & Industrial Relations	1.0
NBB02	Occupational Health & Safety	0.5
NBB04	Computing in Engineering	1.0
NBB06	Machining	1.0
NBB11	Mechanical Components	1.0
MEC072	Hand Tools	0.5
MEC073	Power Tools	0.5
MEC074	Engineering Calculations 1	1.0
MEC076	Drawing Interpretation 1	1.0
MEC080	Maintenance of Engineering Components	1.0
MEC109	Balancing, Levelling and Alignment	1.0
NF15	Materials Science	1.0
NM05	Engineering Calculations	1.0
NM15	Fitting Techniques 1	1.0
NM21	Precision Measurement	1.0
NM29	Power Transmission	1.0
NM34	Air compression Distribution	1.0
NM30	Fluid Power	1.5
NM31	Pneumatics 1	1.0
NM32	Hydraulics 1	1.0
NM44	Drawing Interpretation 2	1.0
NM57	Hydraulics 2	1.0
NM60	Pneumatic System Maintenance. 1	1.0
EPC87	Measurement – Introduction	1.0
	TOTAL	24

MODEL 8

**AQF QUALIFICATION : CERTIFICATE III IN ENGINEERING
MEM 30398 - FABRICATION TRADE**

OCCUPATION : ALUMINIUM SHIPBUILDER

Unit code	Unit Name	Points
1.1F	Interactive Workplace Communication	0
1.2F	Occupational Health and Safety	0
-	(OH&S) in work environment	0
1.3F	Quality Procedures	0
1.4F	Plan to Undertake a Routine Task	0
2.1C12	Apply Quality Systems	2*
2.2C11	Organise and Analyse Information	2*
2.3C11	Operate in a Work Based Team Environment	2*
2.4C11	Assist in the provision of On-The-Job Training	2*
2.5C11	Measure with Graduated Devices	2*
2.6C10	Plan a Complete Activity	4*
2.7C10	Perform Computations – Basic	2*
2.8C10	Perform Computations	2*
2.9C10	Perform Computer Operations	2*
5.5A	Carry out Mechanical Cutting	2
5.7A	Manual Heating, Thermal Cutting & Gouging	2
5.8A	Advanced Manual Heating, Thermal Cutting & Gouging	2
5.9A	Automated Thermal Cutting	2
5.10A	Undertake Fabrication Forming & Shaping	8
5.11A	Assemble Fabrication Components	8
5.13A	Perform Manual Production Welding	2
5.15A	Weld using MMAW Processes	6
5.17A	Weld using GMAW Processes	6
5.18A	Perform Advanced Welding using GMAW	8
5.19A	Weld using GTAW processes	6
5.37A	Geometric Development	6
9.1A	Draw and Interpret Sketch	2
9.2A	Interpret technical Drawing	4
9.3A	Prepare Basic Engineering Drawing	8
12.7A	Mark Off/Out Structural Fabrications & Shapes	4
18.1A	Use Hand Tools	2
18.2A	Use Power Tools / Hand Held Operations	2
	TOTAL	100

*Denotes Compulsory Core CSU's

MODEL 8

**AQF QUALIFICATION : CERTIFICATE III IN ENGINEERING
MEM 30398 - FABRICATION TRADE**

OCCUPATION : ALUMINIUM SHIPBUILDER

RECOMMENDED LEARNING STRATEGY TO ACHIEVE ABOVE CSU'S

Module Code	Module Title	Module Equivalence
NBB00	Introduction to Work Planning	1.0
NBB01	Communication & Industrial Relations	1.0
NBB02	Occupational Health & Safety	0.5
NBB09	Welding & Thermal Cutting	1.0
NBB010	Fabrication Techniques 1	1.0
MEC073	Power Tools (Hand Held)	0.5
MEC075	Produce & Interpret Engineering Sketches	0.5
MEC076	Engineering Drawing Interpretation	1.0
NF162	GMAW 1 Aluminium	0.5
NF163	GMAW 2 Aluminium	0.5
NF171	Marine Fabrication	1.0
NF20	Geometric Development	1.0
NF172	Marine Fabrication 2 (Cylindrical)	1.0
NF173	Marine Fabrication 3 (Cylindrical)	1.0
NF177	Marine Fabrication (Ducting)	1.0
NF179	Marine Drawing (Chine Vessels)	1.0
NF182	Marine Fabrication (Lofting)	1.0
NF184	Marine Drawing (General Arrangements)	1.0
NM353	Marine Corrosion Prevention	1.0
NF174	Marine Fabrication 4 (Conical)	1.0
NF175	Marine Fabrication 5 (Transitions)	1.0
NF170	Welding Technology – Alum/S. Steel	1.0
NF180	Marine Drawing (Round Bilge Vessels 1)	1.0
NF181	Marine Drawing (Round Bilge Vessels 2)	1.0
NF183	Marine Fabrication (Lofting 2)	0.5
NF21	Computer Applications	1.0
NF166	GTAW 1 Aluminium & Stainless Steel	0.5
	TOTAL	24

MODEL 9**AQF QUALIFICATION : CERTIFICATE III IN ENGINEERING
MEM 30398 - FABRICATION TRADE****OCCUPATION : BOILER MAKER**

Unit code	Unit name	Points
1.1F	Interactive Workplace Communication	0
1.2F	Occupational Health and Safety	0
-	(OH&S) in work environment	0
1.3F	Quality Procedures	0
1.4F	Plan to Undertake a Routine Task	0
2.1C12	Apply Quality Systems	2*
2.2C11	Organise and Analyse Information	2*
2.3C1	Operate in a Work Based Team Environment	2*
2.4C1	Assist in the provision of On-The-Job Training	2*
2.5C11	Measure with Graduated Devices	2*
2.6C10	Plan a Complete Activity	4*
2.7C10	Perform Computations – Basic	2*
2.8C10	Perform Computations	2*
2.9C10	Perform Computer Operations	2
5.5A	Carry out Mechanical Cutting	2
5.7A	Manual Heating, Thermal Cutting & Gouging	2
5.8A	Advanced Manual Heating, Thermal Cutting & Gouging	2
5.9A	Automated Thermal Cutting	2
5.10A	Undertake Fabrication Forming & Shaping	8
5.11A	Assemble Fabrication Components	8
5.12A	Perform Routine MMAW and/or GMAW	4
5.16A	Perform Advanced Welding using MMAW	8
5.17A	Weld using GMAW Processes	6
5.18A	Perform Advanced Welding using GMAW	8
5.36A	Repair / Replace / Modify Fabrications	4
5.37A	Geometric Development	6
9.1A	Draw and Interpret Sketch	2
9.2A	Interpret technical Drawing	4
9.3A	Prepare Basic Engineering Drawing	8
12.7A	Mark Off/Out Structural Fabrications & Shapes	4
18.1A	Use Hand Tools	2
18.2A	Use Power Tools / Hand Held Operations	2
	TOTAL	102

*Denotes Compulsory Core CSU's

MODEL 9

AQF QUALIFICATION : **CERTIFICATE III IN ENGINEERING**
MEM 30398 : **- FABRICATION TRADE**

OCCUPATION : **BOILER MAKER**

RECOMMENDED LEARNING STRATEGY TO ACHIEVE ABOVE CSU'S

Module Code	Module Title	Module Equivalence
NBB000	Introduction to Work Planning	1
NBB001	Communication & Industrial Relations	1
NBB004	Computing in Engineering	1
NBB02	Occupational Health & Safety	0.5
NBB009	Welding & Thermal Cutting	1
NBB010	Fabrication Techniques 1	1
MEC062	Cylindrical/Rectangular Fabrication	1
MEC063	Transition Fabrication	1
MEC064	Conical Fabrication	1
MEC070	Advanced Manual Cutting, Gouging & Shaping	0.5
MEC072	Hand Tools	0.5
MEC073	Power Tools (Hand Held)	0.5
MEC074	Engineering Calculations 1	1
MEC075	Produce & Interpret Engineering Sketches	0.5
MEC076	Engineering Drawing Interpretation	1
NF01	Manual Metal Arc Welding I	1
NF02	Gas Metal Arc Welding I	1
NF05	Manual Metal Arc Welding 2	1
NF07	Gas Metal Arc Welding 2	1
NF13	Thermal Cutting & Associated Processes	0.5
NF15	Material Science (1998)	1
NF20	Geometric Development	1
NF31	Fabrication Pipework Drawing	1
NF32	Fabrication Pipework	1
NF33	Fabrication Structural I	1
NF35	Fabrication Structural 3	1
NF91	Fabrication Drawing Interpretation	1
	TOTAL	24.0

MODEL 10**AQF QUALIFICATION : CERTIFICATE III IN ENGINEERING
MEM 30398 - FABRICATION TRADE****OCCUPATION : SHEETMETAL WORKER**

Unit code	Unit name	Points
1.1F	Interactive Workplace Communication	0
1.2F	Occupational Health and Safety (OH&S) in work environment	0
1.3F	Quality Procedures	0
1.4F	Plan to Undertake a Routine Task	0
2.1C12	Apply Quality Systems	2*
2.2C11	Organise and Analyse Information	2*
2.3C11	Operate in a Work Based Team Environment	2*
2.4C11	Assist in the provision of On-The-Job Training	2*
2.5C11	Measure with Graduated Devices	2*
2.6C10	Plan a Complete Activity	4*
2.7C10	Perform Computations – Basic	2*
2.8C10	Perform Computations	2*
2.9C10	Perform Computer Operations	2*
5.1A	Manual soldering/desoldering – electrical components	4
5.5A	Carry out Mechanical Cutting	2
5.6A	Perform brazing and/or silver soldering	2
5.7A	Manual Heating, Thermal Cutting & Gouging	2
5.8A	Advanced Manual Thermal Cutting, Gouging & Shaping	2
5.10A	Undertake fabrication forming and shaping	6
5.11A	Assemble Fabrication Components	8
5.12A	Perform routine manual metal arc welding	4
5.13A	Perform Manual Production Welding	2
5.15A	Weld using metal arc welding process (MMAW)	6
5.17A	Weld using Gas Metal Arc Welding (GMAW) Processes	6
5.19A	Weld Using Gas Tungsten Arc Welding (GTAW) Process	6
5.21A	Weld using Oxy Acetylene Welding (OAW) Process	4
5.37A	Geometric development	4
9.1A	Draw & Interpret Sketch	2
9.2A	Interpret Technical Drawing	4
11.11A	Manual handling	2
12.6A	Mark off/out (general engineering)	4
12.7A	Mark off/out structural fabrications and shapes	4
18.1A	Use hand tools	2
18.2A	Use power tools/hand held operations	2
	TOTAL	98

*Denotes Compulsory Core CSU's

MODEL 10

AQF QUALIFICATION : **CERTIFICATE III IN ENGINEERING**
MEM 30398 : **- FABRICATION TRADE**

OCCUPATION : **SHEETMETAL WORKER**

RECOMMENDED LEARNING STRATEGY TO ACHIEVE ABOVE CSU'S

Module Code	Module Title	Module Equivalence
NBB000	Introduction to Work Planning	1.0
NBB001	Communications & Industrial Relations	1.0
NBB02	Occupational Health & Safety	0.5
NBB09	Welding & Thermal Cutting	1.0
MEC076	Engineering Drawing Interpretation	0.5
NF02	Gas Metal Arc Welding 1	1.0
ND001	Drafting – Orthogonal Concepts	1.0
MEC072	Hand Tools	0.5
MEC073	Power Tools	0.5
NBB10	Fabrication Techniques 1	1.0
NF04	Oxy Acetylene Welding 1	1.0
NF01	Manual Metal Arc Welding 1	1.0
ND015	Drafting, Development Practice	1.0
NF43	Fabrication Light 1	1.0
NF44	Fabrication Light 2	1.0
NF48	Fabrication, Manufacturing General	1.0
NF57	Fabrication, Cubicle 1	1.0
NF47	Fabrication, Parallel Line Development	1.0
NF03	Gas Tungsten Arc Welding 1	1.0
NF10	Gas Tungsten Arc Welding 3	1.0
NF45	Fabrication, Triangulation	1.0
NF46	Fabrication, Radial Line Development	1.0
NF58	Fabrication, Cubicle 2	1.0
NF54	Fabrication, Stainless Steel 1	1.0
NF51	Fabrication, Ducting 1	1.0
NF52	Fabrication, Ducting 2	1.0
	TOTAL	24

MODEL 11

**AQF QUALIFICATION : CERTIFICATE III IN ENGINEERING
MEM 30498 - ELECTRICAL/ELECTRONIC TRADE**

OCCUPATION : AIR CONDITIONING

Unit code	Unit Name	Points
1.1F	Interactive Workplace Communication	0
1.2F	Occupational Health and Safety	0
1.3F	Quality Procedures	0
1.4F	Plan to Undertake a Routine Task	0
2.1C12	Apply Quality Systems	2*
2.2C11	Organise and Analyse Information	2*
2.3C11	Operate in a Work Based Team Environment	2*
2.4C11	Assist in the provision of On-The-Job Training	2*
2.5C11	Measure with Graduated Devices	2*
2.6C10	Plan a Complete Activity	4*
2.7C10	Perform Computations – Basic	2*
2.8C10	Perform Computations	2*
2.9C10	Perform Computer Operations	2*
5.6A	Perform Bronzing/Silver Soldering	2
5.12A	Perform routine Manual Metal Arc Welding	4
9.1A	Draw and Interpret Sketch	2
9.2A	Interpret technical Drawing	4
10.2A	Terminate and connect electrical wiring	3
10.9A	Install refrigeration and air conditioning plant/equipment	4
10.10A	Install pipe work and pipe work assemblies	4
10.90A	Maintain and repair industrial refrigeration systems/components	6
12.2A	Electrical/electronic measurement	2
13.1A	Perform emergency first aid	1
18.1A	Use Hand Tools	2
18.2A	Use Power Tools / Hand Held Operations	2
18.46A	Fault find/repair AC&DC electrical equipment/components	6
18.48A	Fault find/repair/rectify basic electrical circuits	10
18.49A	Disconnect/reconnect fixed wiring equipment	3
18.51A	Fault find/repair/rectify complex electrical circuits	6
18.55A	Dismantle, replace and assemble engineering components	3
18.86A	Test, evacuate and change refrigeration systems	4
18.87A	Service/repair domestic and light commercial RA &AC equipment	6
18.92A	Maintain and repair commercial and or industrial air conditioning controls	6
	TOTAL	100

*Denotes Compulsory Core CSU's

Western Australian Implementation Guide – Metal and Engineering (MEM 98) Training Package November 1998

MODEL 11

**AQF QUALIFICATION : CERTIFICATE III IN ENGINEERING
MEM 30498 - ELECTRICAL/ELECTRONIC TRADE**

OCCUPATION : AIR CONDITIONING

RECOMMENDED LEARNING STRATEGY TO ACHIEVE ABOVE CSU'S

Module Code	Module Title	Module Equivalence
NBB000	Introduction to Work Planning	1.0
NBB001	Communication & Industrial Relations	1.0
NBB009	Welding & Thermal Cutting	1.0
NBB12	Engineering Drawing Interpretation	1.0
NBB15	Electrical Principles and Safety	1.0
MEC072	Hand Tools	0.5
MEC073	Power Tools	0.5
NR01	Refrigeration Fundamentals	1.0
NR02	Refrigeration Procedures	1.0
NR03	Refrigerants	1.0
NR04	Refrigeration Components	0.5
NR05	Air Conditioning Fundamentals	0.5
NR06	Domestic Refrigeration	1.0
NR07	Residential Air conditioning	1.0
NR09	Refrigeration System Operation	1.0
NR10	Refrigeration Controls	1.0
NR11	Installation	1.0
NR12	System Control	1.0
NR13	Ventilation	1.0
NR14	Air conditioning Systems	1.0
NR15	Air conditioning Controls	1.0
NR29	Capillary Systems	1.0
NE31	Electrical Drawing Interpretation	1.0
NE32	Circuit Development 1	1.0
NM100	Disconnect/reconnect Equipment up to 650V	0.5
NM101	Fault find to 250V	0.5
NM102	Fault find to 650V	0.5
EPC233	Flexi Cables	0.5
	TOTAL	24.00

MODEL 12

AQF QUALIFICATION : CERTIFICATE III IN ENGINEERING
MEM 30498 - ELECTRICAL/ELECTRONIC TRADE
OCCUPATION : REFRIGERATION

Unit code	Unit Name	Points
1.1F	Interactive Workplace Communication	0
1.2F	Occupational Health and Safety	0
1.3F	Quality Procedures	0
1.4F	Plan to Undertake a Routine Task	0
2.1C12	Apply Quality Systems	2*
2.2C11	Organise and Analyse Information	2*
2.3C11	Operate in a Work Based Team Environment	2*
2.4C11	Assist in the provision of On-The-Job Training	2*
2.5C11	Measure with Graduated Devices	2*
2.6C10	Plan a Complete Activity	4*
2.7C10	Perform Computations – Basic	2*
2.8C10	Perform Computations	2*
2.9C10	Perform Computer Operations	2*
5.6A	Perform Bronzing/Silver Soldering	2
5.12A	Perform routine Manual Metal Arc Welding	4
9.1A	Draw and Interpret Sketch	2
9.2A	Interpret technical Drawing	4
10.2A	Terminate and connect electrical wiring	3
10.9A	Install refrigeration and air conditioning plant/equipment	4
10.10A	Install pipe work and pipe work assemblies	4
10.90A	Maintain and repair industrial refrigeration systems/components	6
12.2A	Electrical/electronic measurement	2
13.1A	Perform emergency first aid	1
18.1A	Use Hand Tools	2
18.2A	Use Power Tools / Hand Held Operations	2
18.46A	Fault find/repair AC&DC electrical equipment/components	6
18.48A	Fault find/repair/rectify basic electrical circuits	10
18.49A	Disconnect/reconnect fixed wiring equipment	3
18.51A	Fault find/repair/rectify complex electrical circuits	6
18.55A	Dismantle, replace and assemble engineering components	3
18.86A	Test, evacuate and change refrigeration systems	4
18.87A	Service/repair domestic and light commercial RA &AC equipment	6
18.92A	Maintain and repair commercial and or industrial refrigeration controls	6
	TOTAL	100

*Denotes Compulsory Core CSU's

MODEL 12

**AQF QUALIFICATION : CERTIFICATE III IN ENGINEERING
MEM 30498 - ELECTRICAL/ELECTRONIC TRADE**

OCCUPATION : REFRIGERATION

RECOMMENDED LEARNING STRATEGY TO ACHIEVE ABOVE CSU'S

Module Code	Module Title	Module Equivalence
NBB000	Introduction to Work Planning	1.0
NBB001	Communication & Industrial Relations	1.0
NBB009	Welding & Thermal Cutting	1.0
NBB12	Engineering Drawing Interpretation	1.0
NBB15	Electrical Principles and Safety	1.0
MEC072	Hand Tools	0.5
MEC073	Power Tools	0.5
NR01	Refrigeration Fundamentals	1.0
NR02	Refrigeration Procedures	1.0
NR03	Refrigerants	1.0
NR04	Refrigeration Components	0.5
NR05	Air conditioning Fundamentals	0.5
NR06	Domestic Refrigeration	1.0
NR09	Refrigeration System Operation	1.0
NR10	Refrigeration Controls	1.0
NR11	Installation	1.0
NR12	System Control	1.0
NR17	Industrial Refrigeration	1.0
NR18	Merchandising and Display Cabinets	1.0
NR19	Cool Rooms and Freezer Rooms	1.0
NR29	Capillary Systems	1.0
NE31	Electrical Drawing Interpretation	1.0
NE32	Circuit Development 1	1.0
NR45	Commercial Ice Making Systems	0.5
NR46	Post Mix Dairy Products, Refrigerators	0.5
NM100	Disconnect/reconnect Equipment up to 650V	0.5
NM101	Fault find to 250V	0.5
NM102	Fault find to 650V	0.5
EPC233	Flexi Cables	0.5
	TOTAL	24.00

MODEL 13

**AQF QUALIFICATION : CERTIFICATE III IN ENGINEERING - ELECTRICAL
MEM 30498**

OCCUPATION : ENGINEERING TRADES PERSON (ELECTRICAL)

Unit code	Unit Name	Points
1.1F	Interactive workplace communication	0
1.2F	Occupational Health and Safety (OH&S) in work environment	0
1.3F	Quality procedures	0
1.4F	Plan to undertake a routine task	0
2.1C12	Apply quality systems	2*
2.2C11	Organise and analyse information	2*
2.3C11	Operate in a work based team environment	2*
2.4C11	Assist in the provision of on-the-job training	2*
2.5C11	Measure with graduated devices	2*
2.6C10	Plan a complete activity	4*
2.7C10	Perform computations-basic	2*
2.8C10	Perform computations	2*
2.9C10	Perform computer operations	2*
2.13C5	Perform mathematical computations	4
5.1A	Manual soldering/desoldering-electrical/electronic components	4
9.1A	Draw and interpret sketch	2
9.2A	Interpret technical drawing	4
10.2A	Terminate and connect electrical wiring	3
10.3A	Install and test electrical wiring	8
10.11A	Terminate and Connect specialist cables	2
12.2A	Electrical/electronic measurement	2
12.4A	Precision electrical measurement	4
13.1A	Perform Emergency First Aid	1
18.1A	Use hand tools	2
18.2A	Use power tools hand held operations	2
18.3A	Use tools for precision work	4
18.6A	Dismantle/repair/replace/assemble and fit engineering components	6
18.45A	Fault find/repair AC&DC elec. Equipment/components connected to single phase up to 240 volts AC supply (not interconnected)	4
18.46A	Fault/fine/repair elect. Equipment/components connected to a supply of up to 650 volts AC (not interconnected)	6

18.48A	Fault find non interconnected circuits	10
18.49A	Disconnect, reconnect fixed wired equipment up to 1000 volts AC and 1500 volts DC)	3
18.51A	Fault find, repair/rectify complex electrical circuits	6
18.55A	Dismantle, replace and assemble engineering components	3
	TOTAL	102

*Denotes Compulsory Core CSU's

**Denotes dual status Band A and B

Please Note:

As the employers of Electrical Apprentices tend not to “stream” apprentices, as is the case of Mechanical and Fabrication apprentices, (eg Machinist, Fitter Machinist, Mechanical Fitter etc), but rather select training programs based on licensing requirements and their companies industry focus, four (4) typical learning strategy pathways are provided as examples.

Please refer to Examples A, B, C, and D on the following four (4) pages.

MODEL 13

**AQF QUALIFICATION : CERTIFICATE III IN ENGINEERING - ELECTRICAL
MEM 30498**

EXAMPLE A

**OCCUPATION : The Office of Energy Pre-approved Program 1
(Electrical Fitter)**

**RECOMMENDED LEARNING STRATEGY TO ACHIEVE ABOVE CSU'S – Based on
NMEC Modules**

CORE MODULES

Module Code	Module Title	Module Equivalence
NBB000	Introduction to Work and Planning	1
NBB001	Communication and Industrial Relations	1
NBB002	Occupational Health and Safety	0.5
NE11	DC Machines	1
NE12	Synchronous Machines	0.5
NE19	Basic Transducers	0.5
NE31	Electrical Drawing Interpretation	1
NE32	Circuit Development 1	1
NE52	Transformers	0.5
NE130	Programmable Controllers-basics	0.5
NE160	Electrical Principles 1	1.5
NE161	Electrical Principles 2	1.5
NE162	Electrical Principles 3	1.5
NE163	Electrical Heating	0.5
NE165	Three Phase Induction Motors	1.5
NE166	Single Phase Motors	0.5
NE168	Circuit Protection	0.5
NE172	Electrical Wiring and Equipment 1	0.5
NE178	DC Power Supplies	1
	TOTAL	16.5

ELECTIVE MODULES

(7.5 elective modules can be selected from the NMEC Module Bank to equal a course total of 24 modules. The following Electrical modules are considered suitable for an Electrical Fitter.)

Module Code	Module Title	Module Equivalence
NE24	Switchboard Design and Construction 1	1
NE29	Electronic Soldering Technology	1
NE43	Distribution Transformers	1
NE45	Power Distribution System Operating Characteristics	0.5
87568	Electrical Safety and Testing 1	0.5
NE150	Stator Winding 1	1
NE151	Stator Winding 2	1
NE164	Lighting	0.5
NE169	Electrical Installation Requirements 1	1
NE171	Electrical Installation Safety Testing	0.5
NE175	Workshop Practices	1
NE185	Power Control Systems	0.5
	TOTAL	7.5
	Select	7.5
	TOTAL	24

MODEL 13

**AQF QUALIFICATION : CERTIFICATE III IN ENGINEERING - ELECTRICAL
MEM 30498**

EXAMPLE B

**OCCUPATION : The Office of Energy Pre-approved Program 2
(Electrical Fitter)**

**RECOMMENDED LEARNING STRATEGY TO ACHIEVE ABOVE CSU'S – Based on
a combination of NMEC and National Utilities Modules**

CORE MODULES

Module Code	Module Title	Module Equivalence
NBB000	Introduction to Work and Planning	1
NBB001	Communication and Industrial Relations	1
NBB002	Occupational Health and Safety	0.5
NE11	DC Machines	1
NE12	Synchronous Machines	0.5
NE19	Basic Transducers	0.5
NE31	Electrical Drawing Interpretation	1
NE32	Circuit Development 1	1
NE52	Transformers	0.5
NE130	Programmable Controllers –basic	0.5
NUE52	Applied Electricity 1	1
NUE54	Applied Electricity 2	1
NUE55	Applied Electricity 3	1
NUE56	Applied Electricity 4	1
NUE57	Applied Electricity 5	1
NE163	Electrical Heating	0.5
NE165	Three Phase Induction Motors	1.5
NE166	Single Phase Motors	0.5
NE168	Circuit Protection	0.5
NE172	Electrical Wiring and Equipment 1	0.5
NE178	DC Power Supplies	1
	TOTAL	17

ELECTIVE MODULES

(7.0 elective modules can be selected from the NMEC Module Bank to equal a course total of 24 modules. The following Electrical modules are considered suitable for an Electrical Fitter.)

Module Code	Module Title	Module Equivalence
NE24	Switchboard Design and Construction 1	1
NE29	Electronic soldering Technology	1
NE43	Distribution Transformers	1
NE45	Power Distribution System Operating Characteristics	0.5
87568	Electrical Safety and Testing 1	0.5
NE150	Stator Winding 1	1
NE151	Stator Winding 2	1
NE164	Lighting	0.5
NE169	Electrical Installation Requirements 1	1
NE171	Electrical Installation Safety Testing	0.5
NE175	Workshop Practices	1
NE185	Power Control Systems	0.5
	TOTAL	7
	Select	7
	TOTAL	24

MODEL 13

**AQF QUALIFICATION : CERTIFICATE III IN ENGINEERING - ELECTRICAL
MEM 30498**

EXAMPLE C

**OCCUPATION : The Office of Energy Pre-approved Program 3
(Electrical Mechanic “A” Grade Endorsement)**

RECOMMENDED LEARNING STRATEGY TO ACHIEVE ABOVE CSU’S – Based on NMEC Modules

To satisfy the ELB minimum requirements for the issuing of an “A” grade Electrical Mechanic Licence, the following modules have to be selected from the elective stream (as part of a 24 module structure).

The Office of Energy Pre-approved Program 3
(Electrical Mechanic “A” Grade Endorsement)

CORE MODULES

Module Code	Module Title	Module Equivalence
NBB000	Introduction to Work and Planning	1
NBB001	Communication and Industrial Relations	1
NBB002	Occupational Health and Safety	0.5
NE11	DC Machines	1
NE12	Synchronous Machines	0.5
NE19	Basic Transducers	0.5
NE31	Electrical Drawing Interpretation	1
NE32	Circuit Development 1	1
NE52	Transformers	0.5
NE130	Programmable Controllers – basic	0.5
NE160	Electrical Principles 1	1.5
NE161	Electrical Principles 2	1.5
NE162	Electrical Principles 3	1.5
NE163	Electrical Heating	0.5
NE165	Three Phase Induction Motors	1.5
NE166	Single Phase Motors	0.5
NE168	Circuit Protection	0.5
NE172	Electrical Wiring and Equipment 1	0.5
NE178	DC Power Supplies	1
NE173	Electrical Wiring & Equipment 2	1
NE174	Electrical Wiring & Equipment 3	1
NE169	Electrical Installation Requirements 1	1
NE170	Electrical Installation Requirements 2	1.5
NE171	Electrical Installation Safety Testing	0.5
	TOTAL	21.5

ELECTIVE MODULES

(7.0 elective modules can be selected from the NMEC Module Bank to equal a course total of 24 modules. The following Electrical modules are considered suitable for an Electrical Fitter.)

Module Code	Module Title	Module Equivalence
NE24	Switchboard Design and Construction 1	1
NE29	Electronic Soldering Technology	1
NE43	Distribution Transformers	1
NE45	Power Distribution System Operating Characteristics	0.5
87568	Electrical Safety and Testing 1	0.5
NE150	Stator Winding 1	1
NE151	Stator Winding 2	1
NE164	Lighting	0.5
NE169	Electrical Installation Requirements 1	1
NE171	Electrical Installation Safety Testing	0.5
NE175	Workshop Practices	1
NE185	Power Control Systems	0.5
	TOTAL	2.5
	Select	
	TOTAL	24

MODEL 13**AQF QUALIFICATION : CERTIFICATE III IN ENGINEERING - ELECTRICAL
MEM 30498****EXAMPLE D****OCCUPATION : The Office of Energy Pre-approved Program 4
(Electrical Fitter)****RECOMMENDED LEARNING STRATEGY TO ACHIEVE ABOVE CSU'S – Based on
a combination of NMEC and National Utilities Modules****CORE MODULES**

Module Code	Module Title	Module Equivalence
NBB000	Introduction to Work and Planning	1
NBB001	Communication and Industrial Relations	1
NBB002	Occupational Health and Safety	0.5
NE11	DC Machines	1
NE12	Synchronous Machines	0.5
NE19	Basic Transducers	0.5
NE31	Electrical Drawing Interpretation	1
NE32	Circuit Development 1	1
NE52	Transformers	0.5
NE130	Programmable Controllers - basic	0.5
NUE52	Applied Electricity 1	1
NUE54	Applied Electricity 2	1
NUE55	Applied Electricity 3	1
NUE56	Applied Electricity 4	1
NUE57	Applied Electricity 5	1
NE163	Electrical Heating	0.5
NE165	Three Phase Induction Motors	1.5
NE166	Single Phase Motors	0.5
NE168	Circuit Protection	0.5
NE172	Electrical Wiring and Equipment 1	0.5
NE178	DC Power Supplies	1
NE173	Electrical Wiring & Equipment 2	1
NE174	Electrical Wiring & Equipment 3	1
NE169	Electrical Installation Requirements 1	1
NE170	Electrical Installation Requirements 2	1.5
NE171	Electrical Installation Safety Testing	0.5
	TOTAL	22.0

ELECTIVE MODULES

(2.0 elective modules can be selected from the NMEC Module Bank to equal a course total of 24 modules. The following Electrical modules are considered suitable for an Electrical Fitter with a full "A" Grade endorsement.)

Module Code	Module Title	Module Equivalence
NE24	Switchboard Design and Construction 1	1
NE29	Electronic Soldering Technology	1
NE43	Distribution Transformers	1
NE45	Power Distribution System Operating Characteristics	0.5
87568	Electrical Safety and Testing 1	0.5
NE150	Stator Winding 1	1
NE151	Stator Winding 2	1
NE164	Lighting	0.5
NE175	Workshop Practices	1
NE185	Power Control Systems	0.5
	TOTAL	2.0
	TOTAL	24

Employers of apprentices under the “user choice” arrangement may choose modules that do not meet the Office of Energy Licensing requirements. The employer must be advised of this by the provider in order that the employer is aware of this prior to commencing the training. The employer should contact the Metals and Manufacturing ITC with the alternative program and the ITC will seek approval from the Office of Energy.

MODEL 14

**AQF QUALIFICATION : CERTIFICATE IV IN ENGINEERING
MEM 40198 HIGHER ENGINEERING TRADE**

OCCUPATION : FLUID POWER TECHNICIAN

Unit code	Unit name	Points
1.1F	Interactive Workplace Communication	0
1.2F	Occupational Health and Safety (OH&S) in work environment	0
1.3F	Quality Procedures	0
1.4F	Plan to Undertake a Routine Task	0
2.1C12	Apply Quality Systems	2*
2.2C11	Organise and Analyse Information	2*
2.3C11	Operate in a Work Based Team Environment	2*
2.4C11	Assist in the provision of On-The-Job Training	2*
2.5C11	Measure with Graduated Devices	2*
2.6C10	Plan a Complete Activity	4*
2.7C10	Perform Computations – Basic	2*
2.8C10	Perform Computations	2*
2.9C10	Perform Computer Operations	2*
2.13C5	Perform Mathematical Computations	4
7.1A	Operational Maintenance	2
7.5A	General Machining	8
9.1A	Draw and Interpret Sketch	2
9.2A	Interpret Technical Drawings	4
9.3A	Prepare Basic Engineering Drawings	8
9.5A	Basic Engineering Detail Drafting	8
9.9B	Create 2D drawings using computer aided design system	8
13.2A	Undertake OHS-Occupational Health Safety activities in the workplace	3
17.1A	* Assist in development and delivery of training	2
17.2A	* Conduct workplace assessment	2
18.1A	Use Hand Tools	2
18.2A	Use Power Tools	2
18.3A	Use Tools for Precision Work	4
18.4A	Maintain and Overhaul Mechanical Equipment	4
18.5A	Bearing Fault Diagnosis & Installation	4
18.6A	Dismantle/Repair/Replace/Assemble Engineering Components	6
18.7A	Maintain & Repair Mechanical Drives/Transmissions	4
18.9A	Levelling and alignment of Machines and Engineering Components	4
18.11A	Isolate/Shutdown Machines/Equipment	2
18.12A	Install & Remove Mechanical Seals	2
18.13A	Gland Packing	2
18.18A	Maintain Pneumatic System Components	4
18.19A	*Maintain and repair pneumatic systems	4
18.20A	Maintain Hydraulic System Components	4
18.21A	*Maintain and repair hydraulic systems	4
18.22A	*Maintain/repair/replace fluid power controls	8
	TOTAL	137

*Denotes Compulsory Core CSU's. 17.1A, 17.2A are dual status Band A or B to C5.

MODEL 14

**AQF QUALIFICATION : CERTIFICATE IV IN ENGINEERING
MEM 40198 MECHANICAL TRADE**

OCCUPATION : FLUID POWER TECHNICIAN

RECOMMENDED LEARNING STRATEGY TO ACHIEVE ABOVE CSU'S

Module Code	Module Title	Module Equivalence
NBB000	Introduction to Work Planning	1.0
NBB001	Communications & Industrial Relations	1.0
NBB02	Occupational Health & Safety	0.5
NBB04	Computing in Engineering	1.0
NBB06	Machining	1.0
NBB09	Welding and thermal Cutting	1.0
NBB11	Mechanical Components	1.0
MEC072	Hand Tools	0.5
MEC073	Power Tools	0.5
MEC074	Engineering Calculations 1	1.0
MEC075	Produce/Interpret Eng. Sketches	0.5
MEC076	Drawing Interpretation 1	1.0
MEC080	Maintenance of Engineering Components	1.0
MEC108	Bearings & Seals	1.5
MEC109	Balancing, Levelling and Alignment	1.0
NF15	Materials Science	1.0
NM05	Engineering Calculations	1.0
NM06	Computer Aided Drafting A	1.0
NM15	Fitting Techniques 1	1.0
NM21	Precision Measurement	1.0
NM29	Power Transmission	1.0
NM30	Fluid Power	1.5
NM31	Pneumatics 1	1.0
NM32	Hydraulics 1	1.0
NM33	Fluid Power Control 1	1.0
NM44	Drawing Interpretation 2	1.0
NM57	Hydraulics 2	1.0
NM58	Hydraulic Systems Maintenance 1	1.0
NM59	Hydraulics 4	1.0
NM60	Pneumatics Systems Maintenance 1	1.0
NM61	Pneumatics Systems Maintenance 2	1.0
NM63	Hydraulic Control 2	1.0
NM201	Hydraulic System Repair	0.5
EA065	Computer Aided Drafting B	1.0
EA066	Computer Aided Drafting C	1.0
	TOTAL	33.5

MODEL 15**AQF QUALIFICATION : CERTIFICATE IV IN ENGINEERING
MEM 40198 HIGHER ENGINEERING TRADE****OCCUPATION : WELDING INSPECTOR/SUPERVISOR**

Unit code	Unit name	Points
1.1F	Interactive Workplace Communication	0
1.2F	Occupational Health and Safety	0
-	(OH&S) in work environment	0
1.3F	Quality Procedures	0
1.4F	Plan to Undertake a Routine Task	0
2.1C12	Apply Quality Systems	2*
2.2C11	Organise and Analyse Information	2*
2.3C11	Operate in a Work Based Team Environment	2*
2.4C11	Assist in the provision of On-The-Job Training	2*
2.5C11	Measure with Graduated Devices	2*
2.6C10	Plan a Complete Activity	4*
2.7C10	Perform Computations – Basic	2*
2.8C10	Perform Computations	2*
2.9C10	Perform Computer Operations	2
2.10C5	Write reports	2
5.5A	Carry out Mechanical Cutting	2
5.7A	Manual Heating, Thermal Cutting & Gouging	2
5.8A	Advanced Manual Heating, Thermal Cutting & Gouging	2
5.9A	Automated Thermal Cutting	2
5.10A	Undertake Fabrication Forming & Shaping	8
5.11A	Assemble Fabrication Components	8
5.12A	Perform Routine MMAW and/or GMAW	4
5.15A	Weld using MMAW Processes	6
5.16A	Perform Advanced Welding using MMAW	8
5.17A	Weld using GMAW Processes	6
5.24A	Perform welding Supervision	12
5.25A	Perform welding/fabrication inspection	12
5.26A	Apply welding principles	4
5.18A	Perform Advanced Welding using GMAW	8
5.36A	Repair / Replace / Modify Fabrications	4
5.37A	Geometric Development	6
9.1A	Draw and Interpret Sketch	2
9.2A	Interpret technical Drawing	4
9.3A	Prepare Basic Engineering Drawing	8
18.1A	Use Hand Tools	2
18.2A	Use Power Tools / Hand Held Operations	2
	TOTAL	132

*Denotes Compulsory Core CSU's

MODEL 15

**AQF QUALIFICATION : CERTIFICATE IV IN ENGINEERING
MEM 40198 HIGHER ENGINEERING TRADE**

OCCUPATION : WELDING INSPECTOR/SUPERVISOR

RECOMMENDED LEARNING STRATEGY TO ACHIEVE ABOVE CSU'S

Module Code	Module Title	Module Equivalence
NBB000	Introduction to Work Planning	1
NBB001	Communication & Industrial Relations	1
NBB02	Occupational Health & Safety	0.5
NBB009	Welding & Thermal Cutting	1
NBB010	Fabrication Techniques 1	1
MEC070	Advanced Manual Cutting, Gouging & Shaping	0.5
MEC072	Hand Tools	0.5
MEC073	Power Tools (Hand Held)	0.5
MEC074	Engineering Calculations 1	1
MEC075	Produce & Interpret Engineering Sketches	0.5
MEC076	Engineering Drawing Interpretation	1
MEC062	Cylindrical/Rectangular Fabrication	1
MEC063	Transition Fabrication	1
MEC064	Conical Fabrication	1
NF01	Manual Metal Arc Welding I	1
NF02	Gas Metal Arc Welding I	1
NF05	Manual Metal Arc Welding 2	1
NF07	Gas Metal Arc Welding 2	1
NF13	Thermal Cutting & Associated Processes	0.5
NF15	Material Science (1998)	1
NF16	Welding process technology	1
NF17	Welding certificate theory A	1
NF20	Geometric Development	1
NF31	Fabrication Pipework Drawing	1
NF32	Fabrication Pipework	1
NF33	Fabrication Structural I	1
NF35	Fabrication Structural 3	1
NF62	Welding certificate theory B	0.5
NF67	Welding certificate 3/3E	1.5
NF75	Welding Metallurgy	1
NF76	Welding testing and inspection	1
NF77	Codes and specifications-steel structures	1
EA032	Writing technical documents	0.5
EA818	Welding inspection 1	1.5
EA822	Codes and specifications –boiler and pressure vessels	1
NF91	Fabrication Drawing Interpretation	1
	TOTAL	33

ASSESSMENT IMPLICATIONS

Role of the Registered Training Organisation (RTO)

Assessment is the keystone of the Metals and Engineering Training Package (MEM 98), and its change in focus possibly represents the greatest challenge for RTOs. Historically, assessment has been conducted against curriculum or syllabus document learning outcomes. However, under Training Packages assessment must be against each Industry Standard CSU's assessment criteria.

The roles and responsibilities related to assessment are outlined in detail in pages 8-12 of the Training Package Policy Document (MEM 98, November 1998). This is necessary reading for all stakeholders. Key issues, however, are summarised below.

The RTO providing the training and assessment services is responsible for ensuring the quality of the outcomes. The RTO makes the final assessment decision, based on the available evidence and only issues the qualification when all the requirements have been satisfied. It is also the responsibility of the RTO to ensure appropriate assessment occurs and records of the assessment are kept.

Assessment against the CSU's must be at "workplace" level. That is, either demonstrated in a workplace or simulated workplace situation. Accordingly assessment activities can be carried out in the workplace or RTO environments or combinations of workplace and RTO environments.

The Training Package recommends that wherever possible, assessment of CSU's should occur holistically, with groups of CSU's, particularly pre-requisites being assessed simultaneously. As such, assessment should be an evidence gathering process rather than an atomised element by element or unit by unit approach.

ASSESSOR QUALIFICATIONS

There are three minimum requirements for Assessors, individually or as a team.

- Competency in two Competency Standards for Assessment units, ie:
 - "Conduct Assessment in Accordance with an Established Assessment Procedure"
 - "Plan and Review Assessment"
- Competency in the CSU's being assessed.
- Familiar with National Metals and Engineering Competency Standards and agreed industrial processes for implementation.

Assessors must use methods that enable the gathering of valid, sufficient, accurate, consistent, current and authentic evidence.

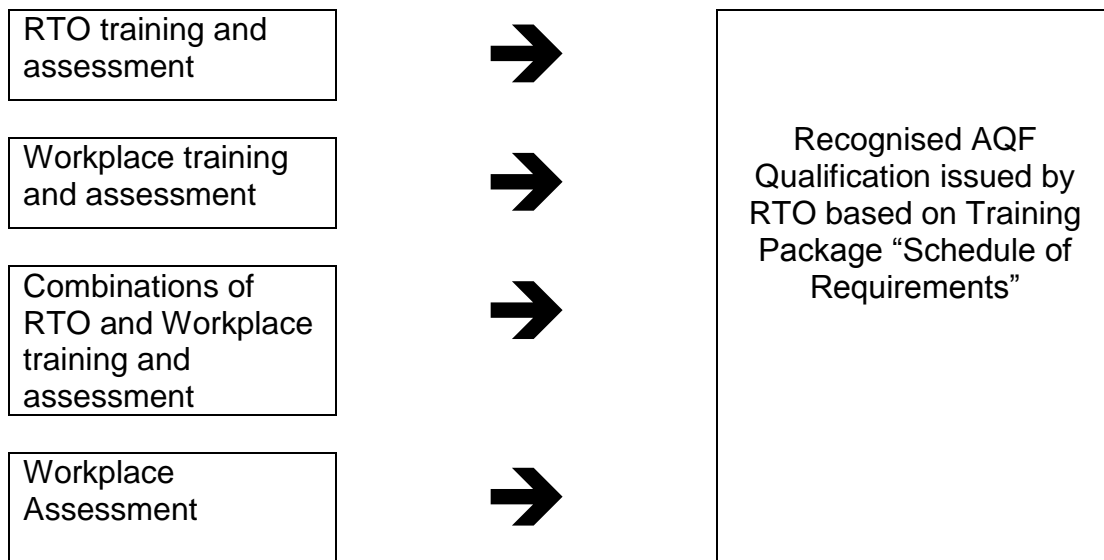
In line with previous assessment requirements, the assessment process must also be valid, reliable, flexible, fair and cost effective.

To facilitate the above the Training Package recommends that a range of assessment techniques be used. These should include, but not be limited to:

- Observation of performance
- Simulations of workplace activities
- Oral questioning
- Practical exercises
- Projects/assignments and work portfolios

It is recommended that in the interests of holistic assessment and cost effective practices, assessment methods that measure a number of related CSU's, particularly Foundation and Core CSU's, through one assessment process or event are utilised.

ASSESSMENT PATHWAYS



LICENSING REQUIREMENTS

The Training Package covers a number of competencies that relate to electrical licensing. The Electrical Licensing Board within the Office of Energy (WA) are the regulatory authority.

Licensing outcomes for the “Electrical Mechanic ‘A’ Grade”, and the Electrical Fitter require the pathway to be approved by the Office of Energy.

The National Restricted Electrical License (NERL) is also covered by the Office of Energy and traditionally has been a requirement of the Airconditioning/Refrigeration trades.

As employers of apprentices under the “user choice” arrangement may choose modules that do not meet the Office of Energy Licensing requirements. The employer must be advised of this by the provider in order that the employer is aware of this prior to commencing the training. The employer should contact the Metals and Manufacturing ITC with the alternative program and the ITC will seek approval from the Office of Energy.

Please note that, at the time of printing, it is not possible to provide a definitive statement on electrical licensing in WA as a National project involving the relevant National ITABS and State Licensing Boards is currently working to determine the licensing requirements in a CSU environment.

