THE REPUBLIC OF UGANDA
Ministry of Education and Sports

Directorate of Industrial Training

Assessment and Training Package

For a

FITTER MACHINIST

Qualification Level: 1

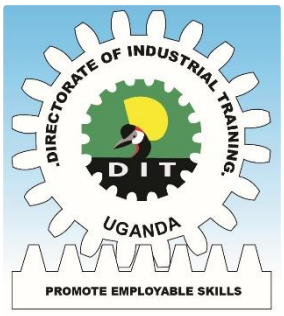
Occupational Cluster: Technology and Design

September 2020

Developed by:

Qualifications Standards Department
Directorate of Industrial Training

Funded by:
Government of Uganda



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ISBN: 978-9913-626-69-9

ISO: 9001:2015 Certificate No.: UG92580A

Under BTVET Act, 2008, the functions of the Directorate of Industrial Training are:

(a) To identify the needs of the labour market for occupational competencies that fall under the UVQF.
(b) To regulate apprenticeship schemes.
(c) To foster and promote entrepreneurial values and skills, as an integral part of the UVQF.
(d) To secure adequate and sustainable financing for the efficient operations of the Directorate.
(e) To accredit training institutions or companies as assessment centres.
(f) To determine fees payable under the Act.
(g) To develop, apply, expand and improve the purposeful application of Uganda vocational qualifications defined in the UVQF.
(h) To assess and award Uganda Vocational Qualifications.
(i) To promote on-the-job training in industry for apprenticeship, traineeship and indenture training and for other training such as further skills training and upgrading.
(j) To prescribe the procedure for the making of training schemes.

Further to the above provisions, there is an established Uganda Vocational Qualifications Framework (UVQF), under part V of the BTVET Act, 2008. It is stated that:

The purpose of the UVQF is to;
(a) Define occupational standards in the world of work.
(b) Define assessment standards.
(c) Award vocational qualifications of learners who meet the set standards of different studies.
(d) Provide guidelines for modular training.

The UVQF shall follow principles of Competence Based Education and Training (CBET) which include:
(a) Flexible training or learning modules.
(b) Positive assessment and certification.
(c) Assessment of prior learning.
(d) Recognition of formal and non-formal training.
(e) Self-paced or individual learning.
(f) Work place learning.

For award and recognition of certificates, the BTVET Act, 2008 provides that:

(1) The Directorate and other examination boards established under the Act shall award certificates and diplomas for Business, Technical or Vocational Education and Training under the UVQF.

(2) The Certificates and Diplomas to be awarded shall be in the form prescribed by the Minister on the recommendation of the Industrial Training Council.

(3) The Certificates and Diplomas awarded under the Act shall be recognised in the Uganda education system and by the labour market.

Under the TVET Implementation Standards 2020, the proposed new mandate of the Directorate of Industrial Training shall be restricted to promoting the highest standards in the quality and efficiency of industrial training in the country and ensuring an adequate supply of properly trained manpower at all levels in the industry and the world of work.

The functions shall include:

(a) Regulating Industrial Training and Trainers.
(b) Developing Industrial Training Curricula.
(c) Harmonising Curricula and Certificates of competence.
(d) Assessing Industrial Training.
(e) Development of Occupational Standards and Assessment and Training Packages (ATPs) for Trade Testing for the industry and world of work.
(f) Awarding certificates in that respect.

At operational level in the Directorate, the Qualification Standards Department performs development tasks related to concepts, procedures and instruments for establishment of the UVQF in close collaboration with both public and private stakeholders in vocational training.

In particular, the Department organises and coordinates the development of Assessment and Training Packages for use in competence-based vocational training as well as standards-based assessment and certification.

The Directorate has therefore produced this Assessment and Training Package for use in implementing Competence-Based Education and Training mechanisms.

TABLE OF CONTENTS

Word from Permanent Secretary

The Kajubi Report (1989) and the Uganda Government White Paper on Education Review (1992) emphasised that the Uganda Secondary School Education should be vocationalised.

The World Bank Report on education in Uganda 2007 observed that although Uganda was experiencing steady economic growth on one hand, the secondary education curriculum was inadequately addressing the social and economic needs of the country on the other. The Report further noted that it is not the very top academic cadres that contribute most to the growth of the GDP but rather the competent middle level technicians that are flexible and technologically literate that the economy needs in the labour market at all levels.

Correspondingly, the NDP III 2020/21- 2024/5 highlights (i) low labour productivity (ii) high youth unemployment (38%) (iii) low transition rates from training to employment (35%) as some of the key challenges to Human Capital Development in Uganda.

In order to overcome these challenges, NDP III 2020/21- 2024/5, under objective 2 peaks the need to train the learners for the urgently needed skills and mainstream a dual education and training system. This paved way for the development of the lower secondary school vocational curriculum which supports both academic and vocational training.

The afore is in line with the Uganda Vision 2040. Under section 261, it emphasises that learners will be accorded opportunities to excel in the skills areas they are placed into. These will range from sports and cut to technical and vocational training. Hitherto, section 262 clearly states that the entire education system will be changed to emphasise practical skills, attitude and moral values.

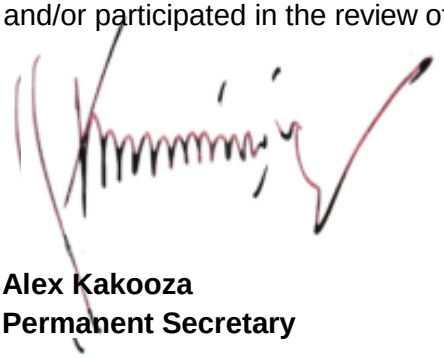
Government of Uganda through the Ministry of Education and Sports rolled out the New Lower Secondary Curriculum in secondary schools countrywide during the first term of the academic year 2020. The overall goal of this curriculum is to produce graduates with employable skills and who are competitive in the labour market. It should be emphasised that vocational training will produce graduates who are employable. In the New curriculum, emphasis will be on equipping learners with employable skills and competencies. This will enable learners perform the requisite duties of the specified occupations. This is the reason why the lower secondary school vocational curriculum was tailored to the assessment requirements of the world of work.

Reading from the Curriculum Framework page 12, it is stated that the learners will be assessed by DIT. Upon assessment and certification, the graduates will be employable and competitive in the labour market. It's against this background that DIT, within its mandate vested in the BTVET Act, 2008 comes on board to take the lead in the development of the requisite Assessment and Training Packages (ATPs) for the various occupations that will be assessed under the Lower Secondary Curriculum.

The ATPs can be used by any training provider and/or those who wish to present themselves for Occupational Assessment and Certification.

Herewith, the Directorate of Industrial Training presents the Assessment and Training Package for training, assessment and certification of a **FITTER MECHANIST QUALIFICATION LEVEL 1.**

Finally, I thank all individuals, organisations and review partners who have contributed and/or participated in the review of this noble document.



Alex Kakooza
Permanent Secretary

Executive Summary

This Assessment and Training Package is a Competence-Based Education and Training (CBET) tool and consists of three major parts:

0.1 **PART I: The Occupational Profile (OP) of a FITTER MECHANIST.** This Occupational Profile which was reviewed by Fitter Mechanists practicing in the world of work mirrors the duties and tasks that Fitter Mechanists are expected to perform.

0.2 **PART II: Training Modules** in the form of guidelines to train Fitter Mechanists both on the job as well as in training centres (or combinations of both venues of learning). The Training Modules herein have been reviewed basing on the Occupational Profile and hence are directly relevant for employment.

0.3 **PART III: Assessment Instruments** in the form of performance (Practical) and written (theory) test items that can and should be used to assess whether a person complies with the requirements of employment as a FITTER MECHANIST. These assessment instruments were reviewed jointly by job practitioners (Fitter Mechanists) and instructors based on the occupational profile and training modules.

0.4 While the Occupational Profile (OP) contained in PART I of this document provides the information on **WHAT a person is expected to do** competently in the world of work, the test items, - including performance criteria- of PART III qualify the **HOW and/or HOW WELL a person must do the job**.

0.5 The modular format of the curriculum (PART II) allows learners to acquire job specific skills and knowledge (i.e. competencies) module by module. A single module can be accomplished within a relatively short duration allowing flexibility for learners to move directly into an entry level job, go for further modules or advance to higher levels of training. Modular courses allow more learners to access the training system because training centres as well as companies can accommodate more learners in a given period of time.

0.6 In addition to improved access, equity and relevance of BTVET, the UVQF will also enable people who are convinced to have acquired competencies laid down in this ATP through prior training and on-the-job experience to access assessment and certification directly; be it on the basis of a single module, a group of modules or all modules pertaining to the occupation at once. This achievement will facilitate Recognition of Prior Learning (RPL).

0.7 The parts of this Assessment and Training Package were sequentially reviewed as follows:

i Part 1: Occupational Profile: ***August 2020***
ii Part 2: Training Modules: ***August 2020***
iii Part 3: Assessment Instruments (initial bank): ***August 2020***

This ATP (or parts of it) may be periodically revised to match the dynamic trends in the occupation and hence issued in different versions.

DIT takes responsibility of any shortcomings that might be identified in this publication and welcomes suggestions for effectively addressing the inadequacies. The suggestion can be communicated to DIT through P.O. Box 20050, Kampala or through email uvaf.dit@gmail.com.

Patrick Byakatonda
Ag. Director

Acknowledgement

The Qualifications Standards Department of DIT wishes to sincerely acknowledge the valuable contributions to the review of this Assessment and Training Package by the following persons, Institutions and organisations:

- Members of the DIT Industrial Training Council,
- The Director and staff of DIT,
- Ministry of Education and Sports,
- The practitioners from the world of work,
- Teachers of Technology and Design from various Secondary Schools,
- Fitter Mechanist Curriculum Specialists from NCDC,
- Examination Specialists from UNEB,
- The facilitators involved in guiding the review panel in their activities,
- The Government of Uganda for financing the review of this ATP.

Abbreviations and acronyms

A&C	Assessment and Certification
ATP	Assessment and Training Packages
CBET	Competency Based Education and Training
DIT	Directorate of Industrial Training
ITC	Industrial Training Council
GoU	Government of Uganda
LWA	Learning-Working Assignment
MC	Modular Curriculum
MoES	Ministry of Education and Sports
MGLSD	Ministry of Gender, Labour and Social Development
MoWT	Ministry of Works and Transport
OP	Occupational Profile
PEX	Practical Exercise
PTI	Performance (Practical) Test Item
QS	Qualification Standards
RPL	Recognition of Prior Learning
TIB	Test Item Bank
TVET	Technical, Vocational, Education and Training
UVQ	Uganda Vocational Qualification
UVQF	Uganda Vocational Qualifications Framework
WTI	Written (Theory) Test Item

Key definitions

Assessment	Assessment is the means by which evidence is gathered and judged to decide if an individual has met the stipulated assessment standards or not. Testing is a form of formal assessment.
Certification	Certification is a formal procedure to issue a certificate (qualification) to an individual that has demonstrated during formal assessment that he/she is competent to perform the tasks specified in the occupational profile.
Competence	Integration of skills, knowledge, attitudes, attributes and expertise in doing /performing tasks in the world of work to a set standard.
Competency	(Occupational) competence is understood as the ability to perform tasks common to an occupation at an acceptable level.
CBET	Competence-based education and training means that programs: 1. have content directly related to work 2. focus is on 'doing something well' 3. assessment is based upon industry work standards, and 4. curricula are developed in modular form
Duty	A Duty describes a large area of work in performance terms. A duty serves as a title for a cluster of related Tasks (see also: TASK).
Learning-Working Assignment (LWA)	LWA are simulated or real job situations / assignments that are suitable for learning in a training environment (e.g. "small projects"). In a working environment LWA are real work situations/assignments.
Module	Modules are part(s) of a whole curriculum. Modules can be considered as "self-contained" partial qualifications which are described by learning outcomes or competencies and which can be assessed and certified individually.
Occupational Profile (OP)	An Occupational Profile is an overview of the duties and tasks a job incumbent is expected to perform competently in employment.

Occupational Profiles developed by practitioners from the world of work enhance the relevance of training and learning to the requirements of the world of work.

Occupational Profiles which define what a person is supposed to do which become the reference points for developing assessment standards and modular curricula.

Qualification A qualification is a formal reward for demonstrating competence, based on formal assessment against set standards and provided to the individual in the form of a certificate specifying the nature of the competence.

Task Job tasks represent the smallest unit of job activities with a meaningful outcome. Tasks result in a product, service, or decision. They represent an assignable unit of work and have a definite beginning and ending point. Tasks can be observed and measured. *(Also see: Duty)*

1.0 ATP-PART I

Occupational Profile for a FITTER MACHINIST

1.1 The OCCUPATIONAL PROFILE (OP) for "FITTER MACHINIST" below defines the ***Duties*** and ***Tasks*** a competent FITTER MACHINIST is expected to perform in the world of work (on the job) in Uganda and the East African region today.

1.2 Since it reflects the skill requirements of work life, the Occupational Profile is the reference document for the subsequent development of training modules and assessment instruments (test items) which are directly relevant to employment in Ugandan and the East African businesses and industries.

1.3 To ensure that the Occupational Profile is relevant for employment in Uganda and East Africa, the DIT used the method of "occupational/job profiling.

This approach involves the brainstorming of a panel of 8 to 12 competent job practitioners guided by trained and experienced facilitators. During a two-day workshop the panelists defined the duties and tasks performed in employment, as well as the prerequisite skills, knowledge, attitudes, tools and equipment, and the future trends and concerns in the occupation/job.

1.4 The panelists, facilitators and coordinators who participated in developing this Occupational Profile are listed on the following page.

Expert Panel
Kalere Godfrey
Lugogo Vocational Training Institute

Boso Bernard
Job Makers Centre (JOMAC)

Luswata Henry
Kamala Maize Millers & Workshop

Wabwire Andrew
Makerere University

Hasahya Moses
Ndejje Secondary School

Etukoit Bernard
Lugogo Vocational Training Institute

Owor Peter
Jinja Vocational Training Institute

Kaweesa Eriya
Mengo Senior School

Oluk Thomas Olet
Sir Samuel Baker School

Kafeero Adnan
National Curriculum Development Centre

Facilitators
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Directorate of Industrial Training

Atai Sarah Engole
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Orikiriza Andrew
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Elizabeth Ruth Mukyala
Directorate of Industrial Training

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Directorate of Industrial Training

Funded by
Government of Uganda

THE REPUBLIC OF UGANDA
Ministry of Education and Sports

Directorate of Industrial Training

Occupational Profile

of a

"FITTER MACHINIST"

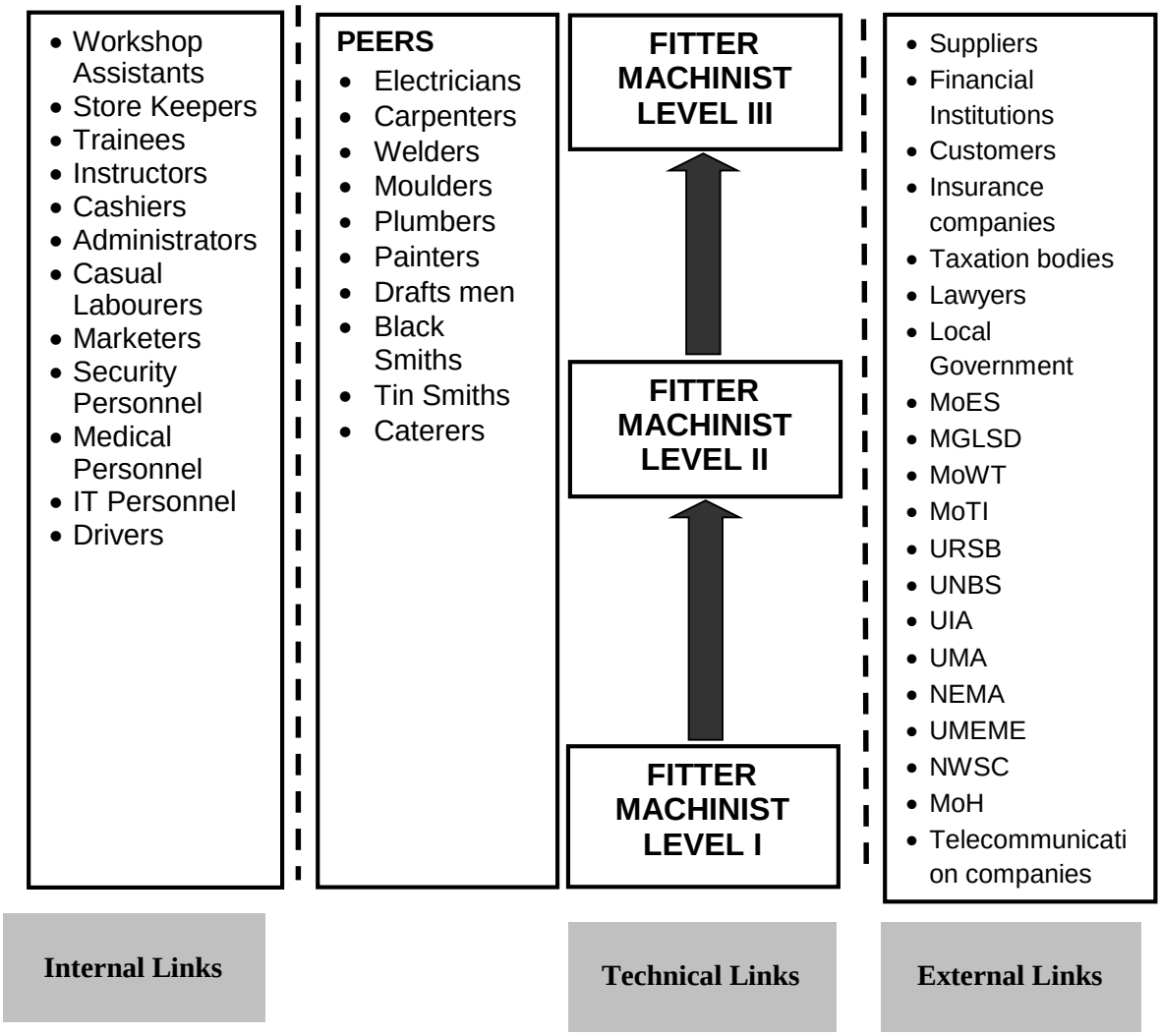
Developed by: Directorate of Industrial Training (Qualifications Standards)

Dates of workshop: 14th –18th September 2020

NOMENCLATURE FOR THE OCCUPATION OF FITTER MACHINIST

Definition: A FITTER MACHINIST is a person who uses hand and machine tools to produce parts/components

JOB ORGANISATION CHART FOR A FITTER MACHINIST



LEVEL DESCRIPTIONS

A **Level I FITTER MACHINIST:** Is able to use basic hand and machine tools to produce simple parts/components and fits them.

A **Level II FITTER MACHINIST**: Is able to use hand and machine tools to produce parts/components and fits them.

A **Level III FITTER MACHINIST:** Is able to use advanced hand and machine tools to produce and fit parts/components and perform administrative tasks.

Duties and Tasks

A. PLAN WORKSHOP ENTERPRISE	**A1** Carryout feasibility study	**A2** Prepare Business plan	**A3** Identify location
	A4 Determine tools, equipment	**A5** Determine materials	**A6** Determine human resource
	A7 Determine source of equipment tool and materials		

B. CONSTRUCT A WORKSHOP STRUCTURE	**B1** Select site	**B2** Make site layout	**B3** Design structure
	B4 Prepare bills of quantities	**B5** Fence off site	**B6** Measure site
	B7 Excavate trenches	**B8** Reinforce trenches	**B9** Setup structures

C. PERFORM MACHINE INSTALLATION	**C1** Determine equipment location	**C2** Prepare foundation	**C3** Set equipment
	C4 Assemble machine parts	**C5** Test machine performance	**C6** Move equipment

D. PREPARE PRODUCTION WORK PLAN	**D1** Organise work place	**D2** Interpret drawings	**D3** Follow standard machining procedures
	D4 Select tools, equipment and materials	**D5** Assign work	**D6** Determine product costs
	D7 Test product		

E. MAINTAIN TOOLS AND EQUIPMENT	**E1** Clean tools and equipment	**E2** Identify mechanical faults	**E3** Grind tools
	E4 Repair tools and equipment	**E5** Replace worn out parts	**E6** Tighten loose parts
	E7 Lubricate moving parts	**E8** Store tools	

F. PRODUCE MACHINE PARTS	**F1**	Cut materials	**F2**	Forge materials	**F3**	Weld materials
	F4	Turn surfaces	**F5**	Shape surfaces	**F6**	Mill surfaces
	F7	Plane surfaces	**F8**	Grind surfaces	**F9**	Drill work pieces
	F10	Bore holes	**F11**	Thread surfaces	**F12**	Glue surfaces
	F13	Braze surfaces	**F14**	Rivet surfaces	**F15**	Slot surfaces

G. PERFORM FINISHING	**G1**	File surfaces	**G2**	Scrape surfaces	**G3**	Knurl surfaces
	G4	Ream surfaces	**G5**	Lap surfaces	**G6**	Chamfer work piece
	G7	Chase threads	**G8**	Electroplate surfaces	**G9**	Blue surfaces
	G10	Carryout heat treatment	**G11**	Paint surfaces	**G12**	Galvanise surfaces
	G13	Tin surfaces	**G14**	Enamel surfaces	**G15**	Hone surfaces

H. MAINTAIN MACHINE RECORDS	**H1**	Prepare maintenance schedules	**H2**	Prepare requisitions	**H3**	Prepare reports
	H4	File records	**H5**	Keep records	**H6**	Update records
	H7	Maintain inventory	**H8**	Manage finances	**H9**	

I. MARKET PRODUCTS	**I1**	Advertise products	**I2**	Brand products	**I3**	Negotiate prices
	I4	Offer customer care services	**I5**	Exhibit products	**I6**	Price products
	I7	Benchmark products				

J. PERFORM OCCUPATIONAL HEALTH, SAFETY AND ENVIRONMENTAL PROTECTION PRACTICES	**J1**	Wear personnel protective gear	**J2**	Display safety signs	**J3**	Guard moving parts
	J4	Demarcate dangerous areas	**J5**	Clear gang ways	**J6**	Manage slippery grounds
	J7	Perform firefighting	**J8**	Administer first aid	**J9**	Manage waste

K. PERFORM ADMINISTRATIVE TASKS	**K1**	Secure land	**K2**	Recruit workers	**K3**	Train workers
	K4	Orient workers	**K5**	Procure tools, equipment and materials	**K6**	Pay bills
	K7	Register enterprise	**K8**	Acquire license	**K9**	Pay taxes
	K10	Supervise works	**K11**	Organise meetings	**K12**	Remunerate workers

Additional Information

Generic Knowledge & Skills

1. Machine operation skills
2. Assembling and dis-assembling skills
3. Knowledge of spare parts
4. Fabrication skills
5. Knowledge of different finishing methods
6. Interpreting technical drawing skills
7. Knowledge about coolants
8. Knowledge about pneumatics
9. Knowledge about bolts and nuts
10. Knowledge about hydraulics
11. Knowledge about tools and spanners
12. Safety rules and regulations
13. Knowledge about materials
14. Knowledge about measuring tools and equipment
15. Knowledge about pumps
16. Knowledge about gears
17. Knowledge about joints
18. Knowledge about heat treatment process
19. Soldering skills
20. Drilling skills
21. Threading skills
22. Turning skills
23. Boring skills
24. Facing skills
25. Maintenance skills
26. Welding skills
27. Milling skills
28. Filing skills
29. Grinding skills
30. Cutting skills
31. Riveting skills
32. Lubricating skills
33. Measuring skills
34. Planning skills
35. Reaming skills
36. Shearing skills
37. Chiseling skills
38. Scrapping skills
39. Firefighting skills
40. Shaping skills
41. Workshop organisation skills
42. Entrepreneurship skills
43. Marking out skills
44. Knurling skills
45. Undercutting/ parting off
46. Knowledge about gauges i.e holes and shaft gauges
47. Knowledge about casting (Foundry work)
48. Forging skills & Forging tools
49. Machine installation (Lifting machines, Preparing foundation of machines and foundation bolts)
50. Couplings (flanges)
51. Knowledge of locking parts (pins, keys, splines)
52. Knowledge about machine drives (chains/sprocket, wheels, belts & pulley, Vee & flat pulleys and belts)

Tools, Materials and Equipment

1. Milling cutters
2. Allen keys
3. Bench vice
4. Hacksaw
5. Hammers
6. Spanners
7. Micrometers
8. Vanier caliper
9. Files
10. Hydraulic press
11. Measuring tape
12. Punches
13. Scribers
14. Vee block
15. Chain blocks
16. Surface plates
17. Rulers (Steel)
18. Spirit Levels
19. Drill bits
20. Carbide tools
21. High speed steel tools
22. Slip gauge
23. Dividers
24. Screw drivers
25. Pliers
26. Circlip removers
27. Chisels
28. Reamers
29. Try square
30. Filler gauges
31. Flatters
32. Scrappers
33. Vernier height gauges
34. Vernier protractors
35. Dial testing indicator
36. Clock indicator
37. Scribing block
38. Center punch
39. Marking out tables
40. Dividing heads
41. Drilling chucks
42. Sleeves
43. Thread pitch gauges
44. Steadies
45. Lathe machine
46. Sharper machine
47. Milling machine
48. Grinding machines
49. Wobbling machines
50. Drilling machines
51. Furnace machine
52. Riveting machines
53. Bearing heating machine
54. Distractive testing machines
55. Power saw
56. Planning machine
57. Hydrolic pneumatic system
58. Shearing machine
59. Soldering machine
60. Welding machine
61. Lifting machine
62. Slotting machine
63. Angle plate
64. Combination square
65. Dies and stock
66. Odd leg calipers
67. Transfer calipers (Adjustable & Firm joint)
68. Trammels
69. Forge
70. Rotary table
71. Anvil
72. Swage block
73. Vices (bench, machine, leg vices)
74. Work benches
75. Tongs
76. Brinel hardness testing machine
77. Oxy-acetylene set
78. Pullers
79. Diamond tool
80. Surface grinder
81. Mandrills
82. Centers

Trends and Concerns	Attitudes/ Traits/ Behaviour
1. Government should set standard salaries for fitter machinists 2. Electron training on new M/C technology 3. Meetings and workshops should be organised for fitter machinists to know their problem 4. More vocational institutions should be built at least at sub-county level to train people for self-employment 5. Government to provide loans (Entandikwa) to those who have trained to set up small scale businesses 6. Jua Kaali sheet metal should be encouraged 7. Promote exhibitions 8. Protect fitter machinists against foreign encroachment 9. Set up associations for fitter machinists 10. Government to promote qualifications upgrade 11. Government sponsorship and scholarships should be made available for fitter machinist courses 12. Computerised machines 13. Government should give tax holidays to fresher fitter machinist graduates who are setting up Workshop enterprises 14. Fitter machinists who are running small scale enterprises should be allowed to freely benchmark with colleagues in the neighbouring countries 15. The review of the ATPs for fitter machinist should be done regularly in order to address rapidly changing technology in the world of work	1. Time consciousness 2. Patient 3. Trustworthy 4. Willing and ready to learn 5. Able to receive correction 6. Healthy and physically fit 7. Team player 8. Hygienic 9. Good customer relations 10. Love your job 11. Observe health and safety rules 12. Sincere 13. Honest 14. Creativity 15. Innovativeness 16. Research oriented 17. Self-motivation 18. Critical thinker 19. Decision maker 20. Empathic 21. Sympathetic 22. Dependable 23. Kind

2.0 ATP-PART II

Training Modules for a FITTER MACHINIST

2.1 A curriculum is a “guide / plan for teaching and learning” which provides a guide to teachers, instructors and learners. In the envisaged system of competence-based or outcome-oriented education and training (CBET), Curricula are no longer the benchmark against which assessment is conducted. It is rather the Occupational Profile and the related Test Items that provide the benchmark for assessment as well as for Curriculum development.

2.2 This modular format of the curriculum allows learners of the FITTER MACHINIST OCCUPATION to acquire job specific skills and knowledge (i.e. competencies) module by module. A single module can be accomplished within a relatively short duration allowing learners to move directly into an entry level job, do further modules and advance to higher levels of training. Modular courses allow more learners to access the training system because training centers as well as companies can accommodate more learners in a given period of time.

2.3 The modules were reviewed jointly by both instructors from training centers and job practitioners. They were developed using the Occupational Profile as a reference point and taking into account the specifications of training and learning outcomes in the form of Test Items described in Part II.

2.4 The modules contain “Learning-Working Assignments” (LWAs) and related “Practical Exercises” (PEXs) as key elements.

LWAs are simulated or real job situations / assignments that are suitable for learning in a training environment (e.g. “small projects”). In a working environment, LWAs are real work situations.

PEXs are therefore sub-sets of a LWA.

2.5 In principle, and following the philosophy of Competence-Based Education and Training (CBET), the modules can be used as a guide for learning in a training center or at the work place; or combinations of both.

WHO IS A FITTER MACHINIST QUALIFICATION LEVEL 1?

A Level I FITTER MACHINIST: Is a person who is able to use basic hand and machine tools to produce simple parts/components and fits them.

TRAINING MODULES FOR A FITTER MACHINIST

Code	Module Title	Average duration	
		Contact hours	Weeks/Months
UE/FM/M1.1	Perform Basic Fitting and Machining Operations	1280	8 months
UE/FM/M1.2	Perform Basic Finishing	320	2months
UE/FM/M1.3	Perform Basic Entrepreneurship Skills	160	1 month
UE/FM/M1.4	Maintain Hand Tools and Workshop Equipment	320	2 months
Summary	**4 Modules**	**2080hrs = 13 months**	

Note: Average duration is contact time but NOT calendar duration

It is assumed that:

- 1 day is equivalent to 8 hours of nominal learning and
- 1 month is equivalent to 160 hours of nominal learning.

Information given on the average duration of training should be understood as a guideline. Quick learners may need less time than indicated or vice versa.

At completion of a module, the leaner should be able to satisfactorily perform the included Learning Working Assignments, their Practical Exercises and attached theoretical instruction, as the minimum exposure.

Prior to summative assessment by a recognised agencies, the users of these Module Guides are encouraged to carefully consider continuous assessment using samples of (or similar) performance (practical) and written test items available in part 3 of this ATP.

Code	UE/FM/M1.1
Module title	**M1.1: Perform Basic Fitting and Machining Operations**
Related Qualification	Part of: Uganda Vocational Qualification (FITTER MACHINIST UVQ1)
Qualification Level	1
Module purpose	By the end of this module the trainee shall be able to produce machine parts, carryout basic interpretation of machine part drawings, and produce basic sections or complete machine parts using a lathe machine, milling machine, shaper, bench work tools. The trainee(s) shall also be able to fix lathe, milling, shaper, machine accessories and attachments.
Learning-Working Assignments (LWAs)	**LWA 1/1. Perform Bench Work Operation** **LWA 1/2. Perform Basic Operation in a Center Lathe** **LWA 1/3. Perform Basic Operation on a Milling Machine** **LWA 1/4. Perform Basic Operation on a Shaper** **LWA 1/5. Practice Use of Bench/Hand Tools** **LWA 1/6. Grind Tools** **LWA 1/7. Perform Occupational Health, Safety and Environmental Protection Practices** **Note:** 1. *The learning exercises must be repeated until the trainee acquires a targeted competence.* 2. *The trainer is advised to deliver relevant theoretical instruction with demonstrations as required to perform each learning working assignment.*
Related Practical Exercises (PEXs)	**LWA 1/1. Perform Bench Work** PEX 1.1. Hold work piece PEX 1.2. Take measurements PEX 1.3. Produce datum surfaces PEX 1.4. Perform marking out PEX 1.5. Perform cutting operations PEX 1.6. Perform chipping operations PEX 1.7. Perform drilling operations PEX 1.8. Perform reaming operations PEX 1.9. Perform threading PEX 1.10. Carry out filing PEX 1.11. Carry out scrapping
	LWA 1/2. Perform Basic Operation in a Center Lathe PEX 2.1. Set work PEX 2.2. Set tool PEX 2.3. Perform surfacing

	PEX 2.4. Perform center drilling PEX 2.5. Support work piece PEX 2.6. Perform plain turning PEX 2.7. Perform chamfering PEX 2.8. Perform threading PEX 2.9. Perform drilling PEX 2.10. Perform boring PEX 2.11. Produce a taper PEX 2.12. Knurl surface PEX 2.13. Recess work piece
	LWA 1/3. Perform Basic Operations on a Milling Machine PEX 2.1. Fix machine attachments and accessories PEX 2.2. Perform vertical operations PEX 2.3. Perform horizontal operations
	LWA 1/4. Perform Basic Operations on a Shaper PEX 4.1. Hold work piece PEX 4.2. Clamp tools PEX 4.3. Set stroke PEX 4.4. Produce vertical flat surface PEX 4.5. Produce horizontal flat surface
	LWA 1/5. Practice Use of Bench/Hand Tools PEX 5.1. Take measurements PEX 5.2. Perform cutting PEX 5.3. Perform finishing
	LWA 1/6. Grind Tools PEX 6.1. Identify the tools PEX 6.2. Mount wheels PEX 6.3. Balance wheels PEX 6.4. Adjust tool rest PEX 6.5. Sharpen tools
	LWA 1/7. Occupational Health, Safety and Environmental Protection Practices PEX 7.1. Administer first aid PEX 7.2. Wear personnel protective equipment PEX 7.3. Keep gang ways clear PEX 7.4. Clean tools and equipment PEX 7.5. Store tools and equipment PEX 7.6. Manage waste PEX 7.7. Display safety signs PEX 7.8. Perform firefighting PEX 7.9. Train workers
Occupational health and safety	Precautions, rules and regulations on occupational health, safety and environmental protection included in the listed related knowledge should be observed and demonstrated during LWAs and PEXs.

Pre-requisite modules	None
Related knowledge/ theory	*For occupational theory suggested for instruction/ demonstration, the trainer is not limited to the outline below. In any case, related knowledge/ theory may be obtained from various recognised reference materials as appropriate:* • Drilling operations • Marking out • Electroplating • Etching • Blackening • Tools and equipment • Tools storage and maintenance
Average duration of learning	1280hrs (8 months) of normal learning suggested. • *2 months of occupational theory.* • *6 months of occupational practice.*
Suggestions on organisation of learning	The acquisition of competencies (skills, Knowledge, attitudes) described in this module may take place at a training center or its equivalent provided all equipment and materials required for training are in place.
Assessment	Assessment to be conducted according to established regulations by a recognised assessment body using related practical and written test items from item bank.
Minimum required tools/ equipment/ implements or equivalent	drilling machine table, lathe machine, knurling tool, chamfer, drills, chucks, vice, cutting tools, milling machine, shaping machine, slotting machine, drilling machine, grinding machine, scriber, emery, rotary table, end mills
Minimum required materials and consumables or equivalent	copper sulphate, coolants, wax, gloves, plates, castings, rods, goggles, lubricants
Special notes	The theory must be integrated into the practice during training.

Code	UE/FM/M1.2
Module title	**M1.2: Perform Basic Finishing**
Related Qualification	Part of: Uganda Vocational Qualification (FITTER MACHINIST UVQ1)
Qualification Level	1
Module purpose	At the end of this module, the trainee shall be able to finish a product
Learning-Working Assignments (LWAs)	**LWA 2/1. Perform Fitting Finishing** **LWA 2/2. Perform Machining Finishing** **LWA 2/3. Perform Occupational Health, Safety and Environmental Protection Practices** ***Note:*** *1. The learning exercises must be repeated until the trainee acquires a targeted competence.* *2. The trainer is advised to deliver relevant theoretical instructions with demonstrations as required to perform each learning working assignment.*
Related Practical Exercises (PEXs)	**LWA 2/1. Perform Fitting Finishing** PEX 1.1. Select tools PEX 1.2. Perform draw filing PEX 1.3. Scrape surfaces PEX 1.4. Chamfer edges PEX 1.5. Blue surface PEX 1.6. Paint surface
	LWA 2/2. Perform Machining Finishing PEX 2.1. Select tools, equipment PEX 2.2. Chamfer edges PEX 2.3. Perform polishing PEX 2.4. Grind surface PEX 2.5. Ream holes PEX 2.6. Chase threads PEX 2.7. Paint surface
	LWA 2/3. Perform Occupational Health, Safety and Environmental Protection Practices PEX 3.1. Wear protective gear PEX 3.2. Cover rotating parts PEX 3.3. Lubricate moving parts PEX 3.4. Manage waste PEX 3.5. Administer first aid PEX 3.6. Display safety signs PEX 3.7. Use tools with safety handles

	PEX 3.8. Perform fire fighting
Occupational health and safety	Precautions, rules and regulations on occupational health, safety and environmental protection included in the listed related knowledge should be observed and demonstrated during LWAs and PEXs.
Pre-requisite modules	None
Related knowledge/ theory	*For occupational theory suggested for instruction/ demonstration, the trainer is not limited to the outline below. In any case, related knowledge/ theory may be obtained from various recognised reference materials as appropriate:* • Finishing methods and techniques • Safety Precautions • Materials • Tools and equipment usage • Regulations and Policies • Sanitation criteria • There should be no vibration when the tool is firm in the tool post • Ø stands for diameter
Average duration of learning	320 hours (2months) of nominal learning suggested to include • *16 days of occupational theory and* • *24 days of occupational practice*
Suggestions on organisation of learning	The acquisition of competencies (skills, knowledge, attitudes) described in this module may take place at a training center or its equivalent provided all equipment and materials required for training are in place.
Assessment	Assessment to be conducted according to established regulations by a recognised assessment body using related practical and written test items from item bank
Minimum required tools/ equipment/ implements or equivalent	files, emery paper, scrappers, reamers, grinder, vanier caliper, micrometer screw gauge, thread chaser, surface gauge, dial gauge, knurling tool, surface plate, tri square, radius gauge, limit gauge, thread gauge, seal tape, measuring tape, hammer, surface grinder, lathe machine, milling machine, marking-on table, anvil block, bench vice, pressing machine, gaggles, gloves, swag block, files, hack saw blades
Minimum required materials and consumables or equivalent	paint, oil, coolant, abrasive, filler, grinding wheels, puller
Special notes	The theory must be integrated into the practice during training

Code	UE/FM/M1.3
Module title	**M1.3: Perform Basic Entrepreneurship Skills**
Related Qualification	Part of: Uganda Vocational Qualification (FITTER MACHINIST UVQ1)
Qualification Level	1
Module purpose	At the end of this module, a trainee shall be able to establish and operate a fitting and machinist workshop in a designated area of choice
Learning-Working Assignments (LWAs)	**LWA 3/1. Establish Fitting and Machining Business** **LWA 3/2. Set Up Workshop Structure** **LWA 3/3. Market Products** **LWA 3/4. Mobilise Resources** **LWA 3/5. Manage Resources** **LWA 3/6. Perform Occupational Health, Safety and Environmental Protection Practices** **Note*:*** *1. The learning exercises must be repeated until the trainee acquires a targeted competence.* *2. The trainer is advised to deliver relevant theoretical instruction with demonstrations as required to perform each learning working assignment.*
Related Practical Exercises (PEXs)	**LWA 3/1. Establish Fitting and Machining Business** PEX 1.1. Conduct basic market research PEX 1.2. Develop business plan PEX 1.3. Determine location PEX 1.4. Determine human resource PEX 1.5. Determine source of raw materials PEX 1.6. Determine source of capital
	LWA 3/2. Set up Workshop Structure PEX 2.1. Select site PEX 2.2. Hire construction services PEX 2.3. Make site layout PEX 2.4. Design structures PEX 2.5. Secure construction materials PEX 2.6. Fence off site PEX 2.7. Take measurements of site PEX 2.8. Erect structures

	LWA 3/3. Market Products PEX 3.1. Cost product PEX 3.2. Advertise products PEX 3.3. Carryout customer care services PEX 3.4. Negotiate with clients PEX 3.5. Network with clients PEX 3.6. Network with peers PEX 3.7. Brand products
	LWA 3/4. Mobilise resources PEX 4.1. Purchase tools and materials PEX 4.2. Recruit workers PEX 4.3. Secure funds
	LWA 3/5. Manage Resources PEX 5.1. Manage human resources PEX 5.2. Manage financial resources PEX 5.3. Keep records PEX 5.4. Pay bills
	LWA 3/6. Perform Occupational Health, Safety and Environmental Protection Practices PEX 6.1. Administer first aid PEX 6.2. Wear personnel protective equipment PEX 6.3. Keep gang ways clear PEX 6.4. Clean tools and equipment PEX 6.5. Store tools and equipment PEX 6.6. Manage waste PEX 6.7. Train workers PEX 6.8. Display safety signs PEX 6.9. Perform firefighting
Occupational health and safety	Precautions, rules and regulations on occupational health, safety and environmental protection included in the listed related knowledge should be observed and demonstrated during LWAs and PEXs.
Pre-requisite modules	None
Related knowledge/ theory	*For occupational theory suggested for instruction/ demonstration, the trainer is not limited to the outline below. In any case, related knowledge/ theory may be obtained from various recognised reference materials as appropriate:* • Business ethics • Innovation • Communication • Management • Financial literacy • Writing skills

Average duration of learning	80hrs (0 days) of nominal learning suggested to include: • *5 days of occupational theory and* • *5 days of occupational practice*
Suggestions on organisation of learning	The acquisition of competencies (skills, knowledge, attitudes) described in this module may take place at a training center or its equivalent provided all equipment and materials required for training are in place.
Assessment	Assessment to be conducted according to established regulations by a recognised assessment body using related practical and written test items from item bank
Minimum required tools/ equipment/ implements or equivalent	library, helmets, gloves, writing tools
Minimum required materials and consumables or equivalent	safety signs, first aid kit box
Special notes	The theory must be integrated into the practice during training

Code	UE/FM/M1.4
Module title	**M1.4: Maintain Hand Tools and Workshop Equipment**
Related Qualification	Part of: Uganda Vocational Qualification (FITTER MACHINIST UVQ1)
Qualification Level	1
Module purpose	By the end of this module, the trainee shall be able to maintain hand tools and workshop equipment used in a workshop
Learning-Working Assignments (LWAs)	**LWA 4.1. Service Hand Tools** **LWA 4.2. Service Workshop Equipment** **LWA 4.3. Store Tools** **LWA 4.4. Perform Occupational Health, Safety and Environmental Protection Practices** **Note*:*** 1. *The learning exercises mat be repeated until the trainee acquires a targeted competence.* 2. *The trainer is advised to deliver relevant theoretical instruction with demonstrations as required to perform each learning working assignment.*
Related Practical Exercises (PEXs)	**LWA 4.1. Service Workshop Equipment** PEX 1.1. Clean workshop equipment PEX 1.2. Clear gang ways PEX 1.3. Grease workshop equipment PEX 1.4. Oil workshop equipment PEX 1.5. Test equipment PEX 1.6. Replace worn out equipment PEX 1.7. Repair damaged workshop equipment
	LWA 4.2. Service Hand Tools PEX 2.1. Identify hand tools PEX 2.2. Clean hand tools PEX 2.3. Re-sharpen hand tools PEX 2.4. Recondition deformed hand tools PEX 2.5. Replace broken hand tools
	LWA 4.3. Store tools PEX 3.1. Clean store PEX 3.2. Install shelves PEX 3.3. Label shelves PEX 3.4. Pack tools PEX 3.5. Keep tool records

	LWA 4.4. Perform Occupational Health and Environmental Protection Practices PEX 4.1. Maintain sanitation PEX 4.2. Sensitise workers on health and safety PEX 4.3. Use personnel protective equipment PEX 4.4. Store tools and equipment PEX 4.5. Practice bio-safety measures PEX 4.6. Perform firefighting PEX 4.7. Administer first aid PEX 4.8. Manage waste PEX 4.9. Comply with safety policies and regulation
Occupational health and safety	Precautions, rules and regulations on occupational health, safety and environmental protection included in the listed related knowledge should be observed and demonstrated during LWAs and PEXs.
Pre-requisite modules	None
Related knowledge/ theory	*For occupational theory suggested for instruction/ demonstration, the trainer is not limited to the outline below. In any case, related knowledge/ theory may be obtained from various recognised reference materials as appropriate:* **Routine/Preventive** • Cleaning • Oiling • Greasing **Repair** • Replace worn out parts • Repleanish rusted parts • Repair broken surfaces
Average duration of learning	320 (40 days) of normal learning suggested. • *10 days of occupational theory.* • *30 days of occupational practices.*
Suggestions on organisation of learning	The acquisition of competencies (skills. Knowledge, attitudes) described in this module may take place at a training center or its equivalent provided all equipment and materials required for training are in place.
Assessment	Assessment to be conducted according to established regulations by a recognised assessment body using related practical and written test items from item bank
Minimum required tools/ equipment/ implements or equivalent	spanners, oil cans, grease guns, Allen keys, grease, oil, wrenches, pliers, spare parts, funnels, spanners, wire brush

Minimum required materials and consumables or equivalent	coolants, cotton waste, sand paper, gloves, manila paper, detergents, gaskets, water, lubricants
Special notes	The theory must be integrated into the practice during training

3.0 ATP PART III

Assessment Instruments for a FITTER MACHINIST

3.1 Assessment of occupational competence is the procedure by which evidence is gathered and judged to decide if an individual (candidate) has met the stipulated assessment standards or not. In this ATP the ***standards*** to assess occupational competences are reflected in the form of the Occupational Profile and related Test Items.

3.2 Assessment of occupational competence should comprise both practical (performance) testing and written (theory/knowledge) testing.

3.3 Based on the Occupational Profile, a combined panel of job practitioners and Instructors developed a substantial number of test items for assessing (practical) performance as well as items for assessing occupational knowledge (theory) all stored in an electronic Test Item Bank (TIB) at Directorate of Industrial Training.

3.4 Performance (Practical) Test Items (PTI) are closely related to typical work situations in Ugandan business and manufacturing enterprises. They comprise a test assignment for candidates and assessment criteria and/or scoring guides for assessors' use.

3.5 Written Test items (WTI) for written testing of occupational theory, (knowledge) are presented in different forms which include:

- Short answer test items.
- Multiple choice test items and,
- Matching test items, These WTIs herein focus on functional understanding as well as trouble-shooting typically synonymous with the world of work.

3.6 Composition of assessment / test papers will always require good choices of different types of WTI in order to ensure the assessment of relevant occupational knowledge required of candidates to exhibit competence.

3.7 The test items contained in the Test Item Bank may be used for continuous / formative assessment during the process of training as well as for summative assessment of candidates who have acquired their competences non-formally/or informally.

3.8 In this document, the following samples of test items for assessing both performance (practical) and occupational knowledge (theory) of **FITTER MACHINIST** are included.

3.9 Overview of Test Item Samples Included

No.	Type of Test Item	Numbers included
1	Written (Theory)- short answer	2
2.	Written (Theory)- multiple choice	2
3.	Written (Theory)- matching item - generic	1
4.	Written (Theory)- (work sequence)	2
5.	Performance (practical) test item	2
	Total	**9**

WRITTEN TEST ITEMS (SAMPLES)

DIT/ QS	**Test Item Database** **Written (Theory) Test Item- No. 1**
Occupational Title:	Fitter Machinist
Competence level:	1
Code no.	
Test Item type:	Short answer: √ Multiple choice: Matching item: Generic / Cause- Effect / Work-sequence
Complexity level:	C2
Date of OP:	September 2020
Related module:	M 1.2
Time allocation:	4 minutes

Test Item	List at least three materials needed in finishing
Answer spaces	(i) …… (ii) …… (iii) ……
Expected Key (answer)	(i) Paint (ii) Coolant (iii) Abrasive (iv) Grinding wheels (v) Oil

DIT/ QS	**Test Item Database** **Written (Theory) Test Item- No. 2**
Occupational Title:	Fitter Machinist
Competence level:	1
Code no.	
Test Item type:	Short answer: √ Multiple choice: Matching item: Generic / Cause-Effect / Work-sequence
Complexity level:	C1
Date of OP:	September 2020
Related module:	M 1.1
Time allocation:	3 minutes

Test Item	Name any three cutters of a milling machine
Answer spaces	(i) …… (ii) …… (iii) ……
Expected Key (answer)	(i) Slotting cutter (ii) Side and face cutter (iii) Slab cutter (iv) Gear cutter

DIT/ QS	**Test Item Database** **Written (Theory) Test Item- No. 3**			
Occupational Title:	Fitter Machinist			
Competence level:	1			
Code no.				
Test Item type:	Short answer			
	Multiple choice	√		
	Matching item	Generic	Cause- Effect	Work-sequence
Complexity level:	C2			
Date of OP:	September 2020			
Related module:	M1.1			
Time allocation:	2 minutes			

Test Item	Which of the following tools is used to remove a tapered shank drill from a drilling machine spindle
Answer spaces	A. Chuck key B. Drift C. Pair of Pliers D. Drill tag

Key (answer)	B

DIT/ QS	**Test Item Database** **Written (Theory) Test Item- no.4**		
Occupational Title:	Fitter Machinist		
Competence level:	1		
Code no.			
Test Item type:	Short answer		
	Multiple choice	√	
	Matching item	Generic	Cause- Effect	Work-sequence
Complexity level:	C1		
Date of OP:	September 2020		
Related module:	MI.3		
Time allocation:	2 minutes		

Test Item	Which of the following tools is used to measure diameter
Distractors and correct answers	A. Slab mill B. End mill C. Vernier caliper D. Tape measure

Key (answer)	C

DIT/ QS	**Test Item Database** **Written (Theory) Test Item- no. 5**
Occupational Title:	Fitter Machinist
Competence level:	1
Code no.	
Test Item type:	Short answer:
	Multiple choice:
	Matching item: Generic √ / Cause- Effect / Work-sequence
Complexity level:	C2
Date of OP:	September 2020
Related module:	M1.2
Time allocation:	4 minutes

Test item	Match the following materials, tools and equipment to their functions in a machinist workshop

Column A (Materials)	
1	Turning
2	Parting off
3	Grinding
4	Shaping

Column B (Functions)	
A	Reciprocating
B	Rotary
C	Fixed
D	Forward translation
E	Oscillating
F	Cross motion

Key (answer)	1:D, 2:C, 3: B, 4: A

DIT/ QS	**Test Item Database** **Written (Theory) Test Item- no. 6**			
Occupational Title:	Fitter Machinist			
Competence level:	Level 1			
Code no.				
Test Item type:	Short answer			
	Multiple choice			
	Matching item	Generic	Cause-Effect	Work-sequence
			√	
Complexity level:	C2			
Date of OP:	September 2020			
Related module:	MI.I			
Time allocation:	5 minutes			

Test Item	Match the tools in Column 1 with their corresponding uses listed in Column 2.

Column A (Tools)	
1	File
2	Vernier Caliper
3	Scribing block
4	Vice

Column B (Uses)	
A	Marking out
B	Reaming work
C	Measuring work
D	Smoothing work
E	Holding work
F	Chipping work

Key (answer)	1:D, 2:C, 3: A, 4: E

DIT/ QS	**Test Item Database** **Written (Theory) Test Item- no. 7**
Occupational Title:	Fitter Machinist
Competence level:	Level 1
Code no.	
Test Item type:	Short answer Multiple choice Matching item: Generic / Cause-Effect / Work-sequence — √
Complexity level:	C2
Date of OP:	September 2020
Related module:	MI.I
Time allocation:	5 minutes

Test Item	Re-arrange the following steps in column B in making a bolt with a knurled head below in their chronological order.

(Chronological order)	**Column B (work steps) in wrong chronological order**	
1st	A	Face ends
2nd	B	Select materials
3rd	C	Cut to size
4th	D	Turn thread end
5th	E	Knurl the head
6th	F	Chamfer the ends
7th	G	Mark the threaded length
8th	H	Add the knurled head in the vice
9th	I	Cut the thread
10th	J	Lubricate the thread
11th	K	Protect the knurl

Key (answer)	1: B, 2:C, 3: A, 4: F, 5: G, 6:D, 7: E, 8: K, 9:H, 10: I, 11: J

PERFORMANCE TEST ITEMS

DIT/ QS	**Test Item Database** **Performance Test Item- No.8**
Occupational Title:	Fitter Machinist
Competence level:	1
Code no.	
Test Item:	Make vice screw bolt from ø30mm * 110mm long from mild steel
Complexity level:	P2
Date of OP:	September 2020
Related modules:	M1.1
Related skills and knowledge:	• Centre lathe machine operation skills, • Finishing • Interpret drawings • Coolants • Safety • Materials • Measurement skills • Turning and drilling
Required tools, Materials and Equipment:	Turning tools, knurling tools, measuring tools, thread gauges, chucks, centre drill, chuck key, tool post spanner, mild steel bar, lathe machine, pedestal grinder, cutting oil
Time allocation:	**6 hours**
Preferred venue:	Mechanical workshop
Remarks for candidates	Follow safety and regulations No extra material will be provided
Remarks for assessors	Provide tools, materials and equipment listed above to Candidates Workshop attendants should be available

#	Assessment criteria	Scoring guide	Max Score	
			Process	Result
1	Observe safety	Wore Protective Gear • Overall • Safety boots • Goggles • Helmet		1 1 1 1
2	Organize tools and materials	Assembled all the required tools and materials		2
3	Grind tools	Grinded tool at clearance angle of 8-12° observed		3
		Grinded tool at rake angle of 10-15°		3
4	Set tool	Set tool on Centre	2	
		Cutting edge coincided with center		1
		Tool not over hanging		1
		Tool firm in tool post		1
5	Machine vice screw bolt	Set work on chuck	2	
		Work ran true		1
		Faced work end	1	
		Center drilled one end	2	
		Turned ø 24*20mm	1	
		Accurately turned ø 24*20mm		1
		Turned ø 20*15mm	1	
		Accurately turned ø 20*15mm		1
		Turned ø 12*15mm	2	
		Accurately turned ø 12*15mm		1
		Turned undercut 3*2mm	2	
		Accurately turned undercut 3*2mm		1
		Chamfered 45°*3mm	1	
		Accurately Chamfered 45°*3mm		1
		Knurled ø 24mm	2	
		Accurately Knurled ø 24mm		2

6	Mark out work for drilling	Marked out hole centers		2
		Punched hole centers		2
7	Prepare drilling machine	Cleaned machine, spindle and table	1	
		Clamped vice on table	1	
		Tight bolts observed		1
		Selected drill bits 10mm and 5mm		1
8	Drill work piece	Clamped work in vice	1	
		Drilled through work piece	2	
		Drilled holes observed		2
9	Die work piece	Held work in bench vice		2
		Cut thread M16*2	2	
		Thread M16*2 generated		2
10	Finish product	Surfaces well generated		2
11.	Cleaned work area and stored tools	Cleaned and stored tools		2
		Cleaned work place		2
	TOTAL		**23**	**41**
	Maximum score (Y)	$\frac{x}{64}$ **x 100**	$\frac{x}{64}$ **x 100**	

DIT/ QS	**Test Item Database** **Performance Test Item- no.9**
Occupational Title:	Fitter Machinist
Competence level:	1
Code no.	
Test Item:	Make a bottle opener from a 50mmx100mmx3mm from mild steel plate
Complexity level:	P2
Date of OP:	September 2020
Related modules:	M1.1
Related skills and knowledge:	• Interpreting drawings • Drilling operations • Chiseling • Measuring skills • Basic knowledge on machining • Fillings
Required tools, Materials and Equipment:	Vernier calipers, scribing block, scribers, files, hacksaw frame and blades, center and dot punches, hammers, anvil, steel rule, tri-square, calipers, scrappers, bench vice and drills, drilling machine, paint
Time allocation:	3 hours
Preferred venue:	Mechanical workshop
Remarks for candidates	Wear personnel protective gear, observe health, materials to be provided once
Remarks for assessors	Provide tools, materials and equipment listed above Workshop attendant should be available all the time

#	Assessment criteria	Scoring guide	Max. Score	
			Process	Result
1	Observe safety	<u>Wore protective gear</u> Overall Safety boots Helmet Hand gloves Goggles		 1 1 1 1
2	Preparation of tools and materials	Selected required material of 50mm x 100mm x 3mm		1
		Assembled appropriate tools		2

3	Marking out surfaces	Prepared datum surfaces	1	
		Two edges at right angles observed		1
		Marked out features	1	
		Profile to be cut out observed		1
		Three holes positioned observed		1
4	Drilling holes	Chain drilled holes around profile	2	
		Holes around profile observed		1
		Drilled three holes	1	
		Three drilled holes observed		3
5	Chamfered holes	Counter sunk three holes	3	
6	Cut out profile	Chipped out profile	3	
		Chipped profile observed		1
7	Remove excess material	Cut excess material using hacksaw	3	
		Bottle opener shape generated		1
8	Finished work piece	Filed shapes to size	3	
		Actual shape and size of bottle opener observed		1
		Filed off sharp edges	1	
		Smooth edges observed		1
		Scraped surfaces	2	
		Smooth surfaces generated		2
		Painted surfaces		1
9	Clean and store tools	Cleaned work place		1
		Tools cleaned		1
		Tools stored		1
	TOTAL(Y)	**Process + Results**	**`20**	**24**
			44	
	TOTAL MAXIMUM SCORE	$\frac{X}{y}$ x 100	$\frac{x}{44}$ **x 100**	

4.0 ATP- PART IV

INFORMATION ON REVIEW PROCESS

4.1 Occupational Profile Review (September 2020)

The Occupational Profile was exclusively reviewed by job practitioners who were working in the FITTER MACHINIST occupation. The job expert panel, guided by UVQF Facilitators defined duties and tasks performed and provided additional generic information regarding the occupation.

4.2 Training Module Review (September 2020)

Based on the Occupational Profile for Fitter Machinist of September 2020, Training Modules were reviewed by job practitioners, guided by UVQF Facilitators.

4.3 Test Item Review (September 2020)

Based on the Occupational Profile for Fitter Machinist of September 2020, and Training Modules, Test Items were reviewed by combined panels of instructors and job practitioners, guided by UVQF Facilitators.

4.4 Methodology

The rationale for the Assessment and Training Package review was to link Vocational Education and Training to the real world of work by bridging Occupational Standards to Training Standards through industry-led Standards-Based Assessment.

Active participation of both instructors and job practitioners' panels consolidated the review philosophy.

The panelists worked as teams in workshop settings complemented by off-workshop field research and literature review activities including international benchmarking.

4.5 Reviewing Panel

The participating panel of Job Practitioners required for different stages of the assessment training package i.e. occupational profile, training modules, assessment instruments were constituted by members from the following organisations;

No.	Name	Institution/ Organisation
1.	Kaweesa Eriya	Mengo Senior School
2.	Kafeero Adnan	National Curriculum Development Centre
3.	Kalere Godfrey	Lugogo Vocational Training Institute
4.	Etukoit Bernard	Lugogo Vocational Training Institute
5.	Boso Bernard	Job Makers Centre (JOMAC)
6.	Luswata Henry	Kamala Maize Millers & Workshop
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4.6 Facilitator team

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4.7 Reference time:

The Assessment and Training Package was compiled in September - 2020 and may be periodically revised to match the dynamic trends in the occupation and hence issued in different versions

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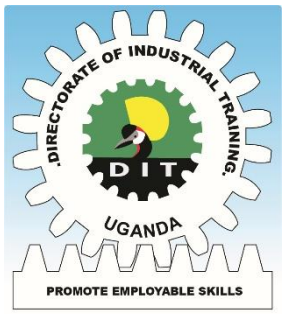

ISBN 978-9913-626-69-9