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LEARNER GUIDE

Faculty	Engineering and Technology
Department	Electrical Engineering
Course	Process Instrumentation
Title	EIEXL1A - Work Based Learning 1
Compiled By	TV Maloka
Year	2025
NQF Level	5
Credits	14

CONTENTS

CONTACT DETAILS

DEPARTMENT	OFFICE	E-MAIL ADDRESS	TELEPHONE
Process Control Coordinator	J003	zeldavt@vut.ac.za	016 950 9432
Co-operative Education	N000	carlen@vut.ac.za	016 950 9161

GENERAL REQUIREMENTS

- It is the responsibility of the student to register for WBL before training commences.
- The student will simultaneously register for EIEXL1A, EIEXL2A and EIPRJ4A, which are the three components of the workplace-based learning.
- The registration, completion and submission of reports must be done according to the guidelines on page 4.
- An accredited assessor, appointed by industry, will do the assessment of each relevant topic. This assessor must have a qualification that is equal to or higher than the qualification being assessed.
- The student must do the training under the supervision of a mentor, which could also be the assessor if the mentor has the necessary qualifications.
- A VUT accredited staff member will act as examiner.
- The assessor must complete the training schedule report (pages 5 to 7), the assessor's declaration (page9), as well as the assessment report (page 10 to18).
- If the mentor or assessor needs any assistance, feel free to contact the Process Instrumentation Coordinator at VUT. (see top of page)
- To fulfil the requirements of the Diploma: Electrical Engineering: Process Instrumentation, the student must successfully complete all academic requirements, as well as the three Workplace Based Learning (WBL)components.
- The syllabus Appendix A (pages 20 to 23) is a generic WBL syllabus for the study fields of Process Instrumentation Engineering. The assessor/mentor can schedule the topics for training.
- Topics that are not included in the list of topics in this document, but are required by the training company should be added using the blank topic 9 on page 18. Add as many topics as necessary by just copying the blank topic 9 on page 18.
- Graduate attribute 12 (GA12) must be covered in this module as part of the requirements of the Engineering Counsel of South Africa (ECSA). The Process Instrumentation Engineering syllabus (pages 20 to 23) contain a detailed explanation of the GA's.

REGISTRATION AND REPORT SUBMISSION INSTRUCTIONS

Registration of Workplace Based Learning (WBL)

Registration procedure:

- Registration for the following WBL modules EIEXL1A, EIEXL2A and EIPRJ4A must be done simultaneously.
- This first module EIEXL1A carries a credit value of 14 with a minimum time requirement of 420 hours (approx. 11 weeks).

Workplace Based Learning (WBL) Reports

Preparation and submission procedure:

- After completion of each topic, the topic must be assessed and signed by the mentor and the student. (page 9 to 18).
- After completion of this module of WBL the assessor must complete the assessor's declaration (page 9).
- The final report for this module must be emailed to the VUT Process Instrumentation Engineering WBL coordinator (Ms Z van Tonder, zeldavt@vut.ac.za).
- Each report document must be sent to the WBL coordinator as it is completed, students should not send all reports at the end of their registration period.

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WORKPLACE BASED LEARNING

PROCESS INSTRUMENTATION ENGINEERING

TRAINING SCHEDULE REPORT
EIEXL1A (420 HOURS)

Procedure to complete and submit the training schedule:

- Complete pages 6 and 7.
- The training schedule report must be signed by the mentor and the student (page 7).
- Choose the topics that could be offered by the company in accordance with their main business.
- If there are other topics, that could be offered by the company, but not mentioned in the document it should be added. Topic 9 on page 16 is a blank topic and should be used for the additional topics.

1 GENERAL INFORMATION –TRAINING SCHEDULE REPORT WBL (EIEXL1A)

STUDENT NUMBER:		**STUDENT'S** POSTAL ADDRESS:
INITIALS &SURNAME:		
ID NUMBER:		
E-MAIL:		
TELEPHONE (WORK):		CELL PHONE:
COMPANY NAME:		NUMBER OF EMPLOYEES:
DIVISION:		NUMBER OF STUDENTS IN TRAINING:
TRAINING SITE/STREET ADDRESS:		NUMBER OF ECSA REGISTERED STAFF:
		COMPANY'S SPECIALIZATION FIELD OR PRODUCTS
ASSESSOR INITIALS & SURNAME:		ACCREDITED ASSESSOR: Y/N
E-MAIL:		CELL OR TELEPHONE:
QUALIFICATIONS:		
WBL REPORT START DATE:		END DATE :

VUT OFFICE USE:

ACCEPTED □ *DECLINED* □

2 TOPICS SCHEDULED FOR WBL1 (EIEXL1A)

The following table shows the possible **applicable** topics that may be included by the company where the workplace based learning takes place. Show the total hours, and marks achieved, for each topic. The scheduled topics are on pages 10 to 18. Extra topics that the company may wish to include should be added. The topics numbered 1 to 7 serves as a guide and may be modified by the company. Modified topics will however need to be approved by VUT.

TOPIC NUMBER	CONTENT TOPICS	TIME (HOURS)	MARK
1	Orientation (Compulsory)		
2	Safety (Compulsory)		
3	Industrial Procedure (Compulsory)		
4	Basic Hand Skills (Compulsory)		
5	Components and Devices (Compulsory)		
6	Test equipment (Compulsory)		
7	Systems and Processes (Compulsory)		
8	Other		
9	Other		
10	Other		
11	Other		
12	Other		
	TOTAL Hours (**MINIMUM 420**)		

WBL SCHEDULE ACCEPTED BY:

STUDENT NAME:

SIGNATURE: *DATE:*

WBL SCHEDULE COMPILED BY:

ASSESSOR NAME:

SIGNATURE: *DATE:*

WBL SCHEDULE ACCEPTED BY VUT:

WBL COORDINATOR NAME:

SIGNATURE: *DATE:*

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WORKPLACE BASED LEARNING (WBL)

PROCESS INSTRUMENTATION ENGINEERING

TOPIC ASSESSMENT REPORT
EIEXL1A (420 Hours)

Procedure to compile and submit the assessment report:

- After completion of each topic, the topic must be assessed by the assessor and signed. (page 10 to 18).
- After completion of this module on WBL the assessor must complete the assessor's declaration (page 9).
- The final report for this module (page 8 to 18) must be submitted **by email** to the WBL coordinator **(Ms Z van Tonder, zeldavt@vut.ac.za).**

2 ASSESSOR DECLARATION –ASSESSMENT REPORT WBL1 (EIEXL1A)

STUDENT INITIALS AND SURNAME: **VUT - STUDENT NUMBER:** **ID NUMBER:**	
COMPANY:	
TRAINING PERIOD **WBL:**	**TO** ***START DATE:*** ***COMPLETION DATE:***
ASSESSOR INITIALS AND SURNAME: **CELL OR TELEPHONE NUMBER:** **E-MAIL:** **ASSESSMENT MARK:**	

ASSESSOR DECLARATION:

I, the above-mentioned assessor, declare that the above-mentioned student has completed this workplace based learning module (WBL) of the qualification in the mentioned period under my supervision. The student was found competent in the outcomes as specified in the assessment report.

SIGNATURE: *DATE:*

VUT OFFICIAL:	**FINAL MARK:**
SIGNATURE:	*DATE:*

ASSESSMENT REPORT AND TRAINING SCHEDULE: WBL1 (EIEXL1A)

SYLLABUS: Process Instrumentation ENGINEERING

TOPIC 1	***ORIENTATION /INTRODUCTION***					
Company policies, procedures and professional requirements.						
After completion of this topic the student should be able to do the following: • Understand the policies, procedures and professional of the company as laid down in the orientation program.						
Start Date:	***End Date:***	***Total Hours:***				
TOPIC MARK (Mark with an X using attached rubric page 19) ***Assessor Signature***: ***Date:***		1	2	3	4	5
Explain how this topic is addressed in the specific workplace and how Graduate attribute 12 (GA12) is attained. *(Refer also to the GA's in the Syllabus pages 20 to 22)*						
Student Signature:	***Date:***					
Mentor Signature:	***Date:***					

TOPIC 2	***SAFETY AND FIRST AID***

Industrial or Mining safety regulations as applicable, NOSA course and Basic first aid course.

After completion of this topic the student should be able to do the following:

- Contribute to the safety, health and environment of the industry as laid down in a safety program.
- Demonstrate and comply with relevant OHS ACT.
- Demonstrate and comply with NOSA safety standards.
- Demonstrate the necessary first aid skills.

Start Date:	***End Date:***	***Total Hours:***

TOPIC MARK (Mark with an X using rubric attached page 19) ***Assessor Signature:*** ***Date:***	1	2	3	4	5

Explain how this topic is addressed in the specific workplace and how Graduate attribute 12 (GA12) is attained. *(Refer also to the GA's in the Syllabus pages 20 to 22)*

Student Signature: ***Date:***

Mentor Signature: ***Date:***

TOPIC 3	**INDUSTRIAL PROCEDURES**

Process Control/Electrical/Electronics engineering

After completion of this topic the student should be able to do the following as applicable to the discipline:

- Understanding of the OHSA.
- Understanding of fire and safety practice as a mandatory outcome from the OHSA.
- Understanding and knowledge of different ISO standards and industry requirements to comply to these standards.
- Understanding and knowledge of the permit system to work on.
- Understanding of occupational safety and other legislative requirements for the practise of a learner technician/student.
- Demonstrate an understanding of safety issues and Occupational Health and Safety regulations, guidelines and principles in the workplace.

Start Date:	***End Date:***	***Total Hours:***

TOPIC MARK (Mark with an X using rubric attached page 19) ***Assessor Signature:*** ***Date:***	1	2	3	4	5

Explain how this topic is addressed in the specific workplace and how Graduate attribute 12 (GA12) is attained. *(Refer also to the GA's in the Syllabus pages 20 to 22)*

Student Signature:			***Date:***			
Mentor Signature:			***Date:***			
TOPIC 4	**BASIC HAND SKILLS**					
Process Control/ Electrical/ / Electronics Engineering						
. After completion of this topic the student should be able to do the following as applicable to the discipline: ● Competent use of basic tools and equipment used in Process control.						
Start Date:	***End Date:***		***Total Hours:***			
TOPIC MARK (Mark with an X using attached rubric page 19) ***Assessor Signature:*** ***Date:***		1	2	3	4	5
Explain how this topic is addressed in the specific workplace and how Graduate attribute 12 (GA12) is attained. *(Refer also to the GA's in the Syllabus pages 20 to 22)*						

Student Signature: ***Date:***
Mentor Signature: ***Date:***

TOPIC 5	**Components and Devices**

Basic process control components and devices.
. After completion of this topic the student should be able to do the following: • Demonstrate the understanding of the different type of field instrumentation as used in industrial plants and environments

. ***Start Date:***	***End Date:***	***Total Hours:***

TOPIC MARK (Mark with an X using attached rubric page 19) ***Assessor Signature:*** ***Date:***	1	2	3	4	5

Explain how this topic is addressed in the specific workplace and how Graduate attribute 12 (GA12) is attained. *(Refer also to the GA's in the Syllabus pages 20 to 22)*

Student Signature:	***Date:***
Mentor Signature:	***Date:***

TOPIC 6	**TEST EQUIPMENT**

Process control test equipment.

After completion of this topic the student should be able to display an understanding of:

- Understanding and uses of test equipment to practise as an Instrument technician.

Start Date:	***End Date:***	***Total Hours:***

TOPIC MARK (Mark with an X using attached rubric page 19) ***Assessor Signature:*** ***Date:***	1	2	3	4	5

Explain how this topic is addressed in the specific workplace and how Graduate attribute 12 (GA12) is attained. *(Refer also to the GA's in the Syllabus pages 18 to 20)*
Student Signature: ***Date:***
Mentor Signature: ***Date:***

TOPIC 7	**SYSTEMS AND PROCESSES**
Process control plant systems	
After completion of this topic the student should be able to: ● Demonstrate the ability to build and cable network infrastructure ● Perform basic configuration according to industry standards and codes.	

Start Date:	***End Date:***	***Total Hours:***

TOPIC MARK (Mark with an X using attached rubric page 19)						

Assessor Signature: ***Date:***	1	2	3	4	5
Explain how this topic is addressed in the specific workplace and how Graduate attribute 12 (GA12) is attained. *(Refer also to the GA's in the Syllabus pages 20 to 22)*					
Student Signature: ***Date:***					
Mentor Signature: ***Date:***					

OTHER TOPICS (Make as many copies of this blank unit as necessary)

TOPIC 8						
After completion of this topic the student should be able to do the following:						
Start Date:	***End Date:***	***Total Hours:***				
TOPIC MARK (Mark with an X using attached rubric page 19) ***Assessor Signature:*** ***Date:***		1	2	3	4	5
Explain how this topic is addressed in the specific workplace and how Graduate attribute 12 (GA12) is attained. *(Refer also to the GA's in the Syllabus pages 20 to 22)*						
Student Signature:		***Date:***				
Mentor Signature:		***Date:***				

WBL - EIEXL1A

Evaluation guideline	This guideline can be used by the assessor to do student evaluation.							
Rating	**Theoretical knowledge**	**Application of theory**	**Use of: advanced tools / measuring equipment**	**Skills integration / Competencies gained**	**Working speed**	**Accuracy**	**Interpersonal relations**	**Diligence motivation**
1 0-19%	Has little knowledge	Cannot apply any theory	Cannot use advanced equipment	Has not integrated any skills	Very slow and do not successfully complete any tasks	Never accurate	Does not get along with any staff	Does nothing unless instructed
2 20-39%	Can recall some basic knowledge	Can apply some theory with assistance	Can use advanced equipment with assistance	Has integrated some documented skills	Never complete tasks successfully on time	Has to redo and then sometimes accurate	Can interact positively with most of the staff	Does just enough to keep out of trouble
3 40-59%	Knows the basic minimum	Can apply the basic minimum theory	Can use advanced equipment to do the basic minimum	Has integrated the basic minimum documented skills	Just complete tasks successfully on time	Just meets the minimum specifications	Interact positively with all the staff	Does the minimum expected
4 60-79%	Good knowledge	Can apply high level theory	Can select and use advanced equipment independently	Effectively integrate skills as needed in practical applications	Normally complete all tasks successfully before/on time	Work is always better than minimum expected	Is accepted by the staff as somebody with good personal skills	Normally looks for over and above work to do
5 80-100%	Excellent knowledge	Can analyze and synthesize	Optimally select and use advanced equipment	Innovatively integrate all theoretical and practical skills to solve problems	Always complete all tasks successfully before time	Work is always excellent.	Uses personality to positively influence other staff	Ambitious and eager to prove talents beyond requirements

APPENDIX A

VAAL UNIVERSITY OF TECHNOLOGY

FACULTY OF ENGINEERING AND TECHNOLOGY

DEPARTMENT ELECTRICAL ENGINEERING
SYLLABUS

INSTRUCTIONAL OFFERING:	Workplace Based Learning
INTERNAL CODE:	EIEXL1A
INSTRUCTIONAL PROGRAMMES:	Diploma in Electrical Engineering
ASSESSMENT:	Written Report
NQF LEVEL:	5
CREDITS:	14
DOCUMENT REVISION:	August 2021

1. Syllabus Content

1. Learning content must include company policies, procedures, safety, and professional requirements.

2. Specific learning content is determined by the Employer. The following represents typical fields of learning content: Basic Hand Skills, Process control components and instrumentation, Test equipment, Systems and Processes.

3. As an NQF level 5 module these fields would typically include: procedures for maintenance of process control instruments and equipment, and the application and use of test equipment.

4. An additional area in which work-place-based learning is recommended is in the aspects of specialized process control systems.

2. Learning Outcomes

It is a compulsory requirement of this course that the student should be able to:

- Display knowledge and understanding of company policies, procedures, and safety and professional requirements.

After completion of this course, the student should be able to demonstrate the following:

- Understand the policy and mission of the company as laid down in the orientation program.
- Understanding of occupational safety and other legislative requirements for the practise of a learner technician/student.
- Demonstrate an understanding of safety issues and application of the Occupational Health and Safety regulations.
- Understanding of fire and safety practice.
- Understanding and knowledge of different ISO standards and industry requirements to comply with these standards.
- Understanding and knowledge of the permit system.
- Demonstrate the ability to use the different kinds of engineering power tools.
- Demonstrate the ability to use of test equipment.
- Demonstrate the ability to use different types of field instrumentation as used in industrial plants and environments.
- Demonstrate the ability to install and remove field equipment to do calibrations.
- Understanding of the use of typical process plant equipment in a plant environment where different control systems, safety systems and other control systems connect to different types of field devices.

3. Graduate Attributes

This module aids to assess the following ECSA defined graduate attributes as applicable to workplace based learning:

Graduate Attribute 12: Workplace practices

Demonstrate an understanding of workplace practices to solve engineering problems consistent with academic learning achieved.

Note: The purpose of workplace-based learning is to enable the learner to connect academic learning with workplace practice.

Range Statement: Tasks to demonstrate this outcome may be performed in one or more of the following curriculum types:

1. Work-directed theoretical learning: in which theoretical forms of knowledge are introduced and sequences in ways that meet both academic criteria and are applicable and relevant to the career-specific components.
2. Problem-based learning: where students work in small self-directed groups to define, carry out and reflect on a task, which is usually a real-life problem.
3. Project-based learning: that brings together intellectual enquiry, real world problems and student engagement in meaningful work.
4. Workplace learning: where students are placed in a professional practice or simulated environment within a training programme.
5. Simulated learning.

4. Graduate attributes assessment

Graduate Attribute 12: Workplace practices Demonstrate an understanding of workplace practices to solve engineering problems consistent with academic learning achieved.	
Where is outcome assessed?	In the workplace.
How is this outcome assessed?	Students are required to produce a report that is verified by a mentor illustrating the ability to apply appropriate theoretical knowledge and understanding to the systems and environment in which the workplace based learning takes place.
What is satisfactory performance?	The report must provide adequate evidence that the student has participated and demonstrated the ability to apply theoretical knowledge to perform maintenance and administration on process instruments and control systems.
What is the consequence of unsatisfactory performance?	Work must be repeated until the appropriate application of theoretical knowledge can be demonstrated.

5. Module Credits

Total Credits = 14

1 Credit = 30 hours

14 Credits x 30 hrs. = 420 Hours (10 - 11 Weeks)

6. Module Knowledge Profile

Mathematical Sciences	Natural Sciences	Engineering Sciences	Engineering Design	Computing and IT	Complementary Studies	Work Integrated learning
						14