



**VAAL UNIVERSITY  
OF TECHNOLOGY**  
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# *STUDY GUIDE*

**Faculty:**

**Engineering and  
Technology**

**Department:**

**Power Engineering**

**Course:**

**Diploma in Electrical  
Engineering**

**Title:**

**Experiential Learning 2  
EPEXP1A**

**Compiled By:**

**MR. I.K Kyere**

**Year:**

**August 2021**



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**Instructional offering: Experiential Learning 1**

**Code: EPEXP2A**

**Instructional programme: Diploma: Engineering: Electrical**

**Assessment: Continues Workplace Based Learning**

**Document revision: August 2021 Advisory committee approved: November 2018**

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## 1 Word of welcome

The Department of Power Engineering welcomes you as a student to the Faculty of Engineering and Technology at the Vaal University of Technology.

The Vision of the Department is to be A Leading Department in Electrical Engineering. The core values of this Department are:

- Integrity
- Honesty
- Punctuality
- Professionalism
- High academic standards
- Excellence
- Trust

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<b>Revision dates</b>	Document revision	August 2021
	Advisory committee approved	November 2018

## 2 General requirements

- It is the responsibility of the student to register for WBL before training commences. Registration may only occur once all modules required credits has been achieved.
- The student should simultaneously register for EPPRJ4A, EPEXL1A and EPEXL2A, which are the three components of the workplace based learning.
- The registration, completion and submission of reports must be done according to the guidelines.
- 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 and sign all required assessors reports before submission to VUT.
- If the mentor or assessor needs any assistance feel free to contact the coordinator at VUT (see top of page) .

- To fulfil the requirements of the Diploma: Electrical Engineering, the student must successfully complete all academic requirements, as well as the three Workplace Based Learning components.
- 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 Other Topics under unit 7 of the final reports evaluation rubric. Add as many topics as needed.
- Graduate attribute 12 (GA 12) must be covered in this module as part of the requirements of the Engineering Council of South Africa (ECSA).

### 3 **Philosophy of Teaching and Learning the subject Experiential Learning 2**

The nature of the learning process for Workplace Based Learning must include but is not limited to the following:

In the workplace the students gain knowledge and understanding in a professional and social setting.

It is expected of the student to interact with the management, mentors, technicians, and peers.

The student must also interact with the broader workplace community through attentive reading of workplace policy and documentation. Each student starts from an initial base of knowledge and experience gained from the previous semester's subjects in the focusing on the broader field of electrical engineering.

All students work from this point to build a more meaningful understanding of the practical application of previous subject matter and to enhance their ability to ask questions and find answers.

The student must learn how to deal with new situations with tough problems and unknown answers.

The following steps may guide the student in the learning process:

Articulate initial knowledge

Add to what is already known to refine and enrich it with the student's own efforts

Articulate and correct misconceptions

Make connections between different concepts as applied to the workplace

Realize the limitations of their own ideas when measure against workplace solutions.

Create and test well defined problems and ideas

Be concerned with the mental processes as well as the "answer"

Reflect on the way their conceptions are changing

Ask questions (what if, why, how.?)

The ideal learning environment must include but is not limited to:

Initial activities are accessible to everyone and come from common experiences in the workplace

The environment is both accepting and critical

Students are made to feel free to propose their own ideas without premature judgment

Students learn to support their ideas while interacting with management, mentors, technicians, and peers

Conversations take place in which all students feel they can contribute

Ideas are illustrated and student interest engaged through demonstrations and experiments

An environment is created that fosters self-motivation among the students within the workplace

A variety of types of learning activities are used to meet the wide range of student needs

Students must develop a sense of accomplishment and satisfaction within the workplace.

The responsibilities of management, mentors, and technicians must include but is not limited to:

Help students learn the language of the discipline

Explain goals and methods

Validate knowledge brought by each student

Create interest and generate curiosity

Encourage students to work hard

Communicate standards of judgment

Help students learn how to use language precisely

Act as a resource without directly answering every question

Provide time to puzzle, wonder, and struggle when permitted.

- Provide fair criticism
- Encourage collaboration
- Teach the student to be an active listener and learner
- Question students so they realize the process of seeking explanations is critically important

The responsibilities of students must include but is not limited to:

- Make use of initial knowledge
- Think freely guided by your workplace environment
- Engage in an active social process of testing and clarifying their understanding
- Develop the ability to work effectively and intensely
- Avoid premature judgment of themselves or others
- Ask questions
- Carefully consider the ideas of others
- Learn to think independently and take responsibility for their own actions
- Value others as useful colleagues
- Evaluate their own progress in an objective manner

## 4 Module

<b>Name:</b>	Experiential Learning 2	EPEXP1A
<b>Prerequisite:</b>	300 credits	

On successful completion of this subject the student will have basic knowledge, experience and understanding to:

- Be able to practice calibration and measurement skills
- Be able to demonstrate the understanding of the basics of measurement setups, techniques and standards applicable.
- Be able to conduct functionality determination of electrical, electronic or computer test equipment used in the specific field as practiced.
- Be able to operate electrical, electronic or computer test equipment used in the specific field as practiced.
- This unit links the work covered in the previous modules in a practical manner, for analysis and as practice.

## 5 Assessment

Assessment takes place on a continuous basis by means of a variety of methods and should include the following:

- Active participation in discussions
- Log Book (Annexure A)
- Progress Report (Annexure B)
- Final Report (Annexure C)

## 6 Learning Activities

When you active involved with Workplace Based Learning you should:

Understand what is expected of each training section you undertake in the workplace.

Ensure that you attain the outcome for each training section you undertake in the workplace since you must be declared competent to receive the credit for the subject.

Do all learning activities (exercises) as outlined by your mentor

Be well prepared for all work activities and report for work on time.

Successful completion of each activity stipulated by your mentor is compulsory.

Submit the final report fully completed and signed off by the mentor and/or manager, on time.

## 7 Time schedule / Semester planner

You must make sure that you adhere to all dates of all learning activities in the workplace environment

This is a scheduler for your use to ensure punctuality.

Week	Activity
1-20	Complete a logbook of activities on a daily basis
10	Complete Progress Report and submit to Co-operative education at VUT Vanderbijlpark Campus Submit partially completed logbook (Annexure A) to Co-operative education at VUT Vanderbijlpark campus
20	Complete Final Report and submit to Co-operative education at VUT Vanderbijlpark Campus Completed logbook (Annexure A) and submit to Co-operative education at VUT Vanderbijlpark campus



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**Vaal University of Technology**  
**Faculty of Engineering and Technology**  
**Department Electronic Engineering**  
**VUT**  
**Annexure A**

**Log Book**

**Instructional offering:** Experiential Learning 2

**Code:** EPEXP1A

**Instructional programme:** Diploma: Engineering: Electrical

**Assessment:** Continues Workplace Based Learning

**Document revision:** August 2021

**Advisory committee approved:** November 2018



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*Logbook WBL EPEXP1A*

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### GENERAL INFORMATION - WBL (EPEXP1A)

<b>STUDENT NUMBER:</b>		<b>STUDENT'S POSTAL ADDRESS:</b>
<b>INITIALS &amp; SURNAME:</b>		
<b>ID NUMBER:</b>		
<b>E-MAIL:</b>		
<b>TELEPHONE (WORK):</b>		<b>CELL PHONE:</b>
<b>COMPANY NAME:</b>		
<b>DIVISION:</b>		
<b>TRAINING SITE/STREET ADDRESS:</b>		
<b>MENTOR INITIALS &amp; SURNAME:</b>		
<b>E-MAIL:</b>		
<b>VUT OFFICE USE :</b>	<b>ACCEPTED</b> <input type="checkbox"/> <b>DECLINED</b> <input type="checkbox"/>	





**ACTIVITIES COMPLETED**

ACTIVITY NUMBER	NAME	DATES	
		STARTED	COMPLETED



**ACTIVITIES SCHEDULED FOR THE REMAINDER OF THE TRAINING PERIOD**

ACTIVITY NUMBER	NAME	ESTIMATED DATES	
		START	COMPLETION



### **PERSONAL GROWTH**

The following is a summary of what I have learned during the past three months in the units that I have completed.


<b>WBL (EPEXPIA) activity log compiled by:</b>		
<i>Students signature</i>	<i>Initials &amp; Surname</i>	<i>Date</i>
<b>WBL (EPEXPIA) activity log certified as correct:</b>		
<i>Mentor's signature</i>	<i>Initials &amp; Surname</i>	<i>Date</i>



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**Annexure B**

**Progress Report**

**Instructional offering:** Workplace Based Learning

**Code:** EPEXP1A

**Instructional programme:** Diploma: Engineering: Electrical

**Assessment:** Continues Workplace Based Learning

**Document revision:** August 2021

**Advisory committee approved:** November 2018



**GENERAL INFORMATION - PROGRESS REPORT WBL (EPEXP1A)**

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

<b>VUT OFFICE USE :</b>	<b>ACCEPTED</b> <input type="checkbox"/>	<b>DECLINED</b> <input type="checkbox"/>
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**UNITS COMPLETED**

The following table must show the units successfully completed during the past three months.

The units can be seen on page 17 to 18.

UNIT NUMBER	UNIT NAME	DATES	
		STARTED	COMPLETED

**UNITS SCHEDULED FOR THE NEXT THREE MONTHS**

The following table must show the units that are scheduled for the next three months of training.

The units can be seen on page 17 to 18.

UNIT NUMBER	UNIT NAME	ESTIMATED DATES	
		START	COMPLETION

### **PERSONAL GROWTH**

The following is a summary of what I have learned during the past three months in the units that I have completed.


<b>WBL (EPEXP1A) Progress report compiled by:</b>		
<i>Students signature</i>	<i>Initials &amp; Surname</i>	<i>Date</i>
<b>WBL (EPEXP1A) Progress report WBL certified as correct:</b>		
<i>Mentor's signature</i>	<i>Initials &amp; Surname</i>	<i>Date</i>



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**Annexure C**

**Final Report**

**Instructional offering:** Workplace based Learning

**Code:** EPEXP1A

**Instructional programme:** Diploma: Engineering: Electrical

**Assessment:** Continues Workplace Based Learning

**Document revision:** August 2021

**Advisory committee approved:** November 2018





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Final report WBL EPEXP1A

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**MENTOR'S DECLARATION - FINAL REPORT WBL (EPEXP2A)**

<b>STUDENT</b>	<b>INITIALS AND SURNAME :</b>	
	<b>VUT - STUDENT NUMBER :</b>	
	<b>ID NUMBER :</b>	
<b>COMPANY :</b>		
<b>TRAINING PERIOD</b>	<b>WBL :</b>	<b>TO</b> <i>START DATE:</i> <i>COMPLETION DATE:</i>
<b>MENTOR</b>	<b>INITIALS AND SURNAME :</b>	
	<b>CELL OR TELEPHONE NUMBER :</b>	
	<b>E-MAIL:</b>	
<b>ASSESSMENT</b>	<b>MARK :</b>	<b>%</b>
<p><b>MENTOR DECLARATION</b></p> <p>I, the above-mentioned mentor, declare that the above-mentioned student has completed the workplace based learning component (WBL) of the qualification in the mentioned period under my supervision.</p> <p>The student was found competent in the outcomes as specified in the assessment report.</p> <p>The mark indicated above may be awarded to the student as the final result for work integrated learning WPBL.</p> <p><i>Mentor Signature</i>                      <i>Mentor Initials &amp; Surname</i>                      <i>Date</i></p>		
<b>VUT OFFICIAL</b>	<b>FINAL MARK:</b>	<b>%</b>

ASSESSMENT: FINAL REPORT WBL EPEXP1A

SYLLABUS: POWER ENGINEERING

UNIT GUIDE

**F= Fundamental (Compulsory)**  
**C= Core (Compulsory for specialization field)**  
**E= Elective (Choice)**

				ASSESSOR'S USE		
Unit 1	ORIENTATION / INDUCTION	POWER ENG	START DATE	END DATE	MARK	SIGNATURE
	General introduction to your specific environment.	F				
After completion of this unit the student should be able to do the following: Understand the policy and mission of the company as laid down in the orientation program.						

				ASSESSOR'S USE		
Unit 2	SAFETY AND FIRST AID	POWER ENG	START DATE	END DATE	MARK	SIGNATURE
	Industrial or Mining safety regulations as applicable	F				
	NOSA course	F				
	Basic first aid course	F				
After completion of this unit 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 OHSACT. Demonstrate and comply with NOSA safety standards.						

				ASSESSOR'S USE		
Unit 3	BASIC HAND SKILLS	POWER ENG	START DATE	END DATE	MARK	SIGNATURE
	Mechanical.	F				
	Electrical / Electronic / Computer.	F				
After completion of this unit the student should be able to do the following as applicable to the discipline: Competent use of basic tools and equipment.						

				ASSESSOR'S USE		
Unit 4	TEST EQUIPMENT	POWER ENG	START DATE	END DATE	MARK	SIGNATURE
	Basics of test equipment	F				
	Application of test equipment	F				
After completion of this unit the student should be able to do the following: Demonstrate the understanding of the basics of test equipment Operate electrical, electronic or computer test equipment used in the specific field.						

	COMPONENTS / DEVICES	POWER ENG	START DATE	END DATE	ASSESSOR'S USE	
					MARK	SIGNATURE
Unit 5	Use	F				
	Characteristics	F				
	Identification	F				
	Testing/ calibration	F				
After completion of this unit the student should be able to do the following: Demonstrate the identification, calibration, testing or use of components/devices.						

	FAULT FINDING AND MAINTENANCE	POWER ENG	START DATE	END DATE	ASSESSOR'S USE	
					MARK	SIGNATURE
Unit 6	Components	F				
	Circuits	F				
	Systems	F				
	Equipment	F				
After completion of this unit the student should be able to do the following: Interpretation of applicable diagrams. Demonstrate the ability to do fault finding and rectification. Test / Calibrate instruments, systems or equipment.						

	CIRCUITS AND FLOW DIAGRAM DESIGN	POWER ENG	START DATE	END DATE	ASSESSOR'S USE	
					MARK	SIGNATURE
Unit 7	Basic design	F				
	Computer design software	F				
	Simulation / Emulation	F				
After completion of this unit the student should be able to do the following: Develop circuit diagrams / flow diagrams. Demonstrate the interpretation of circuits / flow diagrams. Demonstrate knowledge of simulation / emulation.						

	PROGRAMMABLE DEVICES	POWER ENG	START DATE	END DATE	ASSESSOR'S USE	
					MARK	SIGNATURE
Unit 8	Programmable devices	F				
After completion of this unit the student should be able to do the following: Programming, downloading and testing of programs for different programmable devices.						

	INSTALLATION AND COMMISSIONING	POWER ENG	START DATE	END DATE	ASSESSOR'S USE	
					MARK	SIGNATURE
Unit 9	Plant equipment	F				
	Systems	F				
After completion of this unit the student should be able to do the following: Show the ability to work independently in an industrial environment. Show the ability to successfully install and commission equipment or a system.						

					ASSESSOR'S USE	
					ASSESSOR'S USE	
Unit 10	PROTECTION	POWER ENG	START DATE	END DATE	MARK	SIGNATURE
	Specifications	C				
	Implementation	C				
After completion of this unit the student should be able to do the following: Demonstrate the sound knowledge and understanding of different types of protection and safety systems.						

					ASSESSOR'S USE	
					ASSESSOR'S USE	
Unit 11	PROJECT	POWER ENG	START DATE	END DATE	MARK	SIGNATURE
	Industrial project	F				
	Documentation	F				
After completion of this unit the student should be able to do the following: Use of project management tools. Successful completion of a project. Submit project report for assessment.						

					ASSESSOR'S USE	
					ASSESSOR'S USE	
Unit 12	ENERGY SOURCES	POWER ENG	START DATE	END DATE	MARK	SIGNATURE
	DC sources	C				
	AC sources	C				
	Alternative energy sources	E				
	Converters	E				
	Inverters	E				
After completion of this unit the student should be able to do the following: Implementation of knowledge on different types of energy sources. Implement operating principals of converters and inverters.						

