



**VAAL UNIVERSITY  
OF TECHNOLOGY**

*Inspiring thought. Shaping talent.*

# STUDY GUIDE

<b>Faculty</b>	Engineering and Technology
<b>Department</b>	Electrical Engineering: Power
<b>Course</b>	Diploma in Engineering
<b>Title</b>	Experiential Learning 2 – EPEXL2A
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<b>Year</b>	2024
<b>NQF Level</b>	6
<b>Credits</b>	15.7

**Instructional offering:** Experiential Learning 2

**Code:** EPEXL2A

**Instructional program:** Diploma: Engineering: Electrical

**Assessment:** Continues Workplace Based Learning

**Document revision:** January 2024

**Advisory committee approved:** November 2022

## **Index**

1	Word of welcome	2
2	General requirements	2
3	Philosophy of Teaching and Learning	2
3	Module	4
5	Assessment	4
6	Learning activities	4
7	Time Schedule	5
10	ANNEXURE C - Final Report	15

## 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 Advisory committee approved	January 2024 November 2022

## 2 General requirements

- It is the responsibility of the student to register for WBL before training commences. Registration may only occur once all the module's required credits have 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 the industry, will assess each relevant topic. This assessor must qualify equal to or higher than the assessment qualification.
- The student must do the training under the supervision of a mentor, who could also be the assessor if the mentor has the necessary qualifications.
- A VUT-accredited staff member will act as an examiner.
- The assessor must complete and sign all required assessor's reports before submission to VUT.
- If the mentor or assessor needs assistance, feel free to contact the coordinator at VUT (see the top of the page).
- To fulfil the requirements of the Diploma: Electrical Engineering, the student must 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 report's evaluation rubric. Add as many topics as needed.

- Graduate attribute 12 (GA 12) must be covered in this module as part of the Engineering Council of South Africa (ECSA) requirements.

### 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 an 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 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 efforts
- Articulate and correct misconceptions
- Make connections between different concepts as applied to the workplace
- Realize the limitations of their ideas when measuring 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 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 the 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	EPEXL2A
<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 an 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 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
- Final Report (Annexure B)

## 6 Learning Activities

When you are actively 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 the Progress Report and submit it to Co-operative Education at VUT Vanderbijlpark Campus Submit the partially completed logbook (Annexure A) to Co-operative Education at the VUT Vanderbijlpark campus
20	Complete the Final Report and submit it to Co-operative Education at VUT Vanderbijlpark Campus Completed logbook (Annexure A) and submitted to Co-operative education at VUT Vanderbijlpark campus

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

**Final Report**

**Instructional offering:** Workplace-based Learning

**Code:** EPEXL2A

**Instructional program:** Diploma: Engineering: Electrical

**Assessment:** Continues Workplace Based Learning

**Document revision:** January 2024

**Advisory committee approved:** November 2022

**MENTOR'S DECLARATION - FINAL REPORT WBL (EPEXL2A)**

STUDENT	INITIALS AND SURNAME :	
	VUT - STUDENT NUMBER :	
	ID NUMBER :	
COMPANY :		
TRAINING PERIOD	WBL :	TO START DATE: COMPLETION DATE:
MENTOR	INITIALS AND SURNAME :	
	CELL OR TELEPHONE NUMBER :	
	E-MAIL:	
	ASSESSMENT MARK :	<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 of workplace-based learning (WPBL).</p> <p><i>Mentor Signature</i>                                  <i>Mentor Initials &amp; Surname</i>                                  <i>Date</i></p>		
VUT OFFICIAL	FINAL MARK:	<b>%</b>



ASSESSMENT: FINAL REPORT WBL EPEXL2A

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 E	
					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	
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	
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	
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.						

	OTHER TOPICS RELEVANT TO MEASUREMENTS AND COMMISSIONING	START DATE	END DATE	ASSESSOR'S USE	
				MARK	SIGNATURE
	Any other specialization field-specific topics may be added by the mentor. The mentor must give realistic credit values to the topics.				

GRADUATE ATTRIBUTES				ASSESSOR'S USE	
				MARK	SIGNATURE
Has the student achieved all the outcomes mentioned in the marks summary page and thus achieved graduate attribute 12 of the ECSA stipulations?	F			YES ---- NO	