VAAL UNIVERSITY OF TECHNOLOGY

FACULTY OF ENGINEERING AND TECHNOLOGY

DEPARTMENT PROCESS CONTROL AND COMPUTER SYSTEMS ENGINEERING

SYLLABUS

INSTRUCTIONAL OFFERING:	Work-place-based Learning
INTERNAL CODE:	EIEXC2A
INSTRUCTIONAL PROGRAMMES:	Diploma in Electrical Engineering
ASSESSMENT:	Work Based Assessments
NQF LEVEL:	6
CREDITS:	16
DOCUMENT REVISION:	March 2019

1. Syllabus Content

a) Specific learning content is determined by the Employer. The following represents typical fields of learning content: Computer Hardware Systems, Operating Systems, Networks, Software, Databases and Software Engineering.

b) As an NQF level 6 module these fields would typically include the development, building and configuration of systems which may include servers, computers, industrial and other computing devices and systems. This typically would include both hardware and operating systems. The development, installation and configuration of employer software systems may also be included.

c) Other areas in which work-place-based learning is recommended is in the more advanced aspects of data communication systems such as LAN and WAN network systems. This could include the design, configuration and implementation of network infrastructure.

d) Another area where students may receive world-place-based exposure is in the design, development, configuration and implementation of software, database and/or IOT systems.

2. Learning Outcomes

After completion of this course the student should be able to demonstrate at least one or more of the following:

- The ability to perform system development. This may include design, configuration and implementation of server systems and clients for the work-based environment.

- The ability to design, implement and configure network infrastructure according to industry standards and codes.
- The ability to apply, implement or develop software and database systems for a business or industrial environment.

3. Graduate Attributes (GA's)

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

Graduate Attribute 1: Problem Solving

Apply engineering principles to systematically diagnose and solve *well-defined* engineering problems.

Graduate Attribute 2: Application of scientific and engineering knowledge

Apply knowledge of mathematics, natural science and engineering sciences to applied engineering procedures, processes, systems and methodologies to solve *well-defined* engineering problems.

Range Statement: Knowledge of mathematics, natural science and engineering science is characterized by:

1. A coherent range of fundamental principles in mathematics and natural science underlying a sub-discipline or recognised practice area.
2. A coherent range of fundamental principles in engineering science and technology underlying an engineering sub-discipline or recognised practice area.
3. A codified practical knowledge in recognised practice area.
4. The use of mathematics, natural sciences and engineering sciences, supported by established mathematical formulas, codified engineering analysis, methods and procedures to solve well-defined engineering problems.

Graduate Attribute 5: Engineering methods, skills, tools, including Information technology

Use appropriate techniques, resources, and modern engineering tools including information technology for the solution of *well-defined* engineering problems, with an awareness of the limitations, restrictions, premises, assumptions and constraints.

Range Statement: A range of methods, skills and tools appropriate to the discipline of the program including:

1. Sub-discipline-specific tools processes or procedures.
2. Computer packages for computation, simulation, and information handling;
3. Computers and networks and information infrastructures for accessing, processing, managing, and storing information to enhance personal productivity and teamwork;
4. Basic techniques from economics, management, and health, safety and environmental protection.

Graduate Attribute 11: Workplace practices

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

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

Range Statement: Tasks to demonstrate this attribute 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

ECSA Graduate attribute	Assessment details
Graduate Attribute 1: Problem Solving Apply engineering principles to systematically diagnose and solve *well-defined* engineering problems.	
Where is outcome assessed?	In the work place.
How is this outcome assessed?	Solving of work-based problems must be demonstrated in the design, configuration and implementation of systems relevant to the student's work environment.
What is satisfactory performance?	System design, configuration and implementation must be demonstrated to be functional within the requirements of the particular system.
What is the consequence of unsatisfactory performance?	Work must be repeated until the desired results can be achieved.

Graduate Attribute 2: Application of scientific and engineering knowledge Apply knowledge of mathematics, natural science and engineering sciences to applied engineering procedures, processes, systems and methodologies to solve *well-defined* engineering problems.	
Where is outcome assessed?	In the work place.
How is this outcome assessed?	The application of engineering knowledge and practices used in the design and implementation of systems relevant to the work environment must be demonstrated.
What is satisfactory performance?	The engineering knowledge and practices must be demonstrated to be appropriate to the requirements.
What is the consequence of unsatisfactory performance?	Work must be repeated until the desired system requirements can be achieved.

Graduate Attribute 5: Engineering methods, skills, tools, including Information technology Use appropriate techniques, resources, and modern engineering tools, including information technology, prediction and modelling, for the solution of broadly-defined engineering problems, with an understanding of the limitations, restrictions, premises, assumptions and constraints.	
Where is outcome assessed?	In the work place.
How is this outcome assessed?	Students are required to demonstrate the use of appropriate techniques, resources and modern engineering tools in the development or design and implementation of systems that they work on.
What is satisfactory performance?	Knowledge of the application and use of tools appropriate to the discipline and the task can be demonstrated.
What is the consequence of unsatisfactory performance?	Work must be repeated until the required skills and methodologies can be demonstrated.

Graduate Attribute 11: Workplace practices Demonstrate an understanding of workplace practices to solve engineering problems consistent with academic learning achieved.	
Where is outcome assessed?	In the work place.
How is this outcome assessed?	Students are required to demonstrate the ability to apply appropriate theoretical knowledge and understanding to the systems and environment in which the work-place-based learning takes place.
What is satisfactory performance?	Appropriate and applicable theoretical knowledge is used to perform implementations, configurations, design or development.
What is the consequence of unsatisfactory performance?	Work must be repeated until the appropriate application of theoretical knowledge can be demonstrated.

5. Module Credits

L	TL	ML	T	Tt	Mt	P	Tp	Mp	X	Tx	Mx	A	Ta	E	Me	Credit
0	1	1	0	1	1	300	1	0.5	0	1	1	16	1	14	1	16

L	Lectures Sessions	**TL**	Lecture Duration	**ML**	Work per Lecture period
T	Tutorials Sessions	**Tt**	Tutorial Duration	**Mt**	Work per tutorial period
P	Practical Sessions	**Tp**	Practical Duration	**Mp**	Work per practical period
X	Other contact Sessions	**Tx**	Other Duration	**Mx**	Work other period
A	Assessment	**Ta**	1 Hour	**E**	Work outside (Me = 1)

6. Module Knowledge Profile

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