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| **VUT LOGO** | | | | |
| **Faculty of Engineering and Technology**  **Electrical Engineering: Process Control** | | | | |
| **Workplace Based Learning Guide**  WBL  **Code: EIEXL1A** | | | | |
| **Approved:** Advisory committee meeting    **Contents**   * Contact Details and General Requirements………………………………………….3 * Registration and Report Submission Instructions……………………………………4 * Training Schedule Report………………………………………………………………5 * Topic Assessment Report………………………………………………………………8 * Workplace Based Learning (WBL) Evaluation Guideline………………………….18 * Appendix A Syllabus……………………………………………………………….. 19 | | | | |
| **Contact details** | | | | |
| **Department** | **Office** | **e-mail address** | **Telephone** | |
| Computer Systems Coordinator | S112 | koosm@vut.ac.za | 016 950 9434 | |
| Co-operative Education | N000 | pricilla@vut.ac.za | 016 950 9707 | |
| **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 (page 9), as well as the assessment report (page 10 to17). * If the mentor or assessor needs any assistance feel free to contact the Process Control Coordinator at VUT. (see top of page) * To fulfil the requirements of the Diploma: Electrical Engineering: Process Control, the student must successfully complete all academic requirements, as well as the three Workplace Based Learning components. * The syllabus Appendix A (pages 19 to 21) is a generic WBL syllabus for the study fields of Process Control/Electrononics/Power 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 8 on page 17. Add as many topics as necessary by just copying the blank topic 8 on page 17. * Graduate attributes: GA11must be covered in this module as part of the requirements of the Engineering Counsel of South Africa (ECSA). The Process Control Engineering syllabus (pages 19 to 21) contain a detailed explanation of the GA’s. * The assessor must also indicate on the topic assessment form, which of the graduate attribute (GA’s) are attained in each topic. The requirement is that GA 11 must be covered in this module. | | | | |

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| 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 EIEXC1A 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:   * The training schedule report (pages 5 to 7), must be completed and emailed to the VUT Process Control coordinator (Mr. PJ Mitton) as soon as possible after this module of WBL commences. |
| * After completion of each topic, the topic must be assessed and signed (page 9 to 17). * After completing this module of WBL the assessor must complete the assessor’s declaration (page 9). * The final report for this module must be submitted by post or in person to the Cooperative Education Office ( Room N100) at VUT. During Covid we can make use of email to coordinator |

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| Vaal University of Technology  Faculty of Engineering and Technology  Workplace based Learning  Process Control Engineering |
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| WBL  **Training Schedule Report**  **EIEXL1A (420 Hours)** |
| Procedure to complete and submit the training schedule: |
| * Within 14 days after WBL commenced the training schedule report (pages 5 to 7) must be emailed to the relevant VUT WBL coordinator. (Mr PJ Mitton, email address; koosm@vut.ac.za). * Complete pages 6 and 7. * The report must be signed by the mentor and the student (page 7). * Only the topics that are offer by the company in accordance with their main business must be done. If there are other topics not mentioned in the document it should be added. Topic 8 on page17 is a blank topic and should be used for the additional topics. |

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| **1** | **General information – Training SCHEDULE REPORT WBL (EIEXlA)** | | | | | | | | |
| **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: | | |
| **WBL report** Start date: | | | |  | | | End date : | | |
| **VUT Office use :** | |  | | | *Accepted* □ | | | *Declined* □ | |
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| **2** | **Topics scheduled for WBL 1 (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 for each topic.  The scheduled topics are on pages 10 to 17. Extra topics that the company may wish to include should be added. The topics numbered 1 to 8 serves as a guide and may be modified by the company. Topics will however need to be approved by VUT. |

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|  | **Topic number** | **Content Topics** | **Time Hours** |
|  |
|  | 1 | Orientation / Induction (Compulsory) |  | |
|  | 2 | Safety and First Aid (Compulsory) |  | |
|  | 3 | Industrial Procedures (Compulsory) |  | |
|  | 4 | Basic Hand skills (Compulsory) |  | |
|  | 5 | Components and Devices (Compulsory) |  | |
|  | 6 | Test Equipment (Compulsory) |  | |
|  | 7 | Systems and Processes (Compulsory) |  | |
|  | 6 | Other |  | |
|  | 7 | Other |  | |
|  | 8 | Other |  | |
|  | 9 | Other |  | |
|  | 10 | Other |  | |
|  | 11 | Other |  | |
|  | 12 | Other |  | |
|  |  | TOTAL Hours | 420 | |

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|  | **WBL Training Schedule Report compiled by:** | |
|  | *Students signature* | *Date* |
|  | **WBL Training Schedule**  **report certified as correct:** | |
|  | *Assessor’s signature* | *Date* |

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| Vaal University of Technology  Faculty of Engineering and Technology  Workplace based Learning (WBL)  Process Control Engineering |
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| WBL  **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 17) * 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 17) must be submitted **by post** or in person to the Cooperative Education department (Room N100) at the VUT.Make use of email during covid |

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| 2 | **ASSESSOR DECLARATION – ASSESMENT REPORT WBL 1 (EIEXL1A)** |

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| **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** |  |  |
| **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:** |

#### ASSESMENT REPORT AND TRAINING SCHEDULE WBL 1 (EIEXL1A)

#### Syllabus: process Control Engineering

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| **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 18)  **Assessor Signature**:………………………..  **Date:** | | | | | | | 1 | | | 2 | | | | | 3 | | | 4 | | | | 5 | |
| **Graduate attributes**  Mark the GA’s addressed in this unit with an X)  (See syllabus pages 19 to 21) | | | | | | GA 11 | | | | | |  | | | |  | | | |  | | |
| **Student’s Report :Explain how this topic is addressed in the specific workplace.**  (Refer also to the GA’s in the Syllabus pages 19 to 23) Insert more lines if necessary | | | | | | | | | | | | | | | | | | | | | | | |
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| **Student Signature** | | | | | **Assessor Signature** | | | | | | | | | | | | | | | | | | |
| **Topic** | | | | | **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 OHSACT. * 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 18)  **Assessor Signature:** | | | | 1 | | | | 2 | | | | | 3 | | | | 4 | | | | 5 | | |
| **Graduate attributes**  Mark the GA’s addressed in this unit with an X)  (See syllabus pages 19 to 21) | | | GA 11 | | | | | |  | | | | |  | | | | |  | | | |
| **Explain how this topic is addressed in the specific workplace.**  (Refer also to the GA’s in the Syllabus pages 19 to 21) Insert more line if needed | | | | | | | | | | | | | | | | | | | | | | | |
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| **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 18)  **Assessor Signature*:*** | | | 1 | | | 2 | | | 3 | | 4 | | 5 | |
| **Graduate attributes**  Mark the GA’s addressed in this unit with an X)  (See syllabus pages 19 to 21) | | | | | GA 11 | | |  | |  | |  | |
| **Explain how this topic is addressed in the specific workplace.**  (Refer also to the GA’s in the Syllabus pages 19 to 21) Insert more line if needed | | | | | | | | | | | | | | |
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| **Student Signature** | | | | **Assessor Signature** | | | | | | | | | | |
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| **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 rubric attached page 18)  **Assessor Signature:** | | | 1 | | | | 2 | | | | | 3 | | | | 4 | | | | | 5 | | |
| **Graduate attributes**  Mark the GA’s addressed in this unit with an X)  (See syllabus pages 19 to 21) | | | | | | GA 11 | | | | |  | | | |  | | | | |  | | |
| **Explain how this topic is addressed in the specific workplace.**  (Refer also to the GA’s in the Syllabus pages 19 to 21) Insert more lines if needed | | | | | | | | | | | | | | | | | | | | | | | |
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| **Student Signature** | | | | **Assessor Signature** | | | | | | | | | | | | | | | | | | | |
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| **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 18)  **Assessor Signature:** | | | | | 1 | | | 2 | | | | | 3 | | | | 4 | | 5 | | | | |
| **Graduate attributes**  Mark the GA’s addressed in this unit with an X)  (See syllabus pages 19 to 21) | | | | | | GA 11 | | | | |  | | | |  | | | | |  | | |
| **Explain how this topic is addressed in the specific workplace.**  (Refer also to the GA’s in the Syllabus pages 19 to 21) Insert more lines if needed | | | | | | | | | | | | | | | | | | | | | | | |
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| **Student Signature** | | | | **Assessor Signature** | | | | | | | | | | | | | | | | | | | |
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| **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 18)  ***Assessor Signature:*** | | | | | | | 1 | | 2 | | | | | 3 | | | | 4 | | | | 5 | |
| **Graduate attributes**  Mark the GA’s addressed in this unit with an X)  (See syllabus pages 19 to 21) | | | | | | GA 11 | | | | |  | | | |  | | | | |  | | |
| **Explain how this topic is addressed in the specific workplace.**  (Refer also to the GA’s in the Syllabus pages 19 to 21) Insert more lines if needed | | | | | | | | | | | | | | | | | | | | | | | |
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| **TOPIC 7** | **Systems and Processes** | | | | | | | | | | | | | |
| Process control plant systems | | | | | | | | | | | | | | |
| After completion of this topic the student should be able to demonstrate the ability to:   * 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 18)  **Assessor Signature:** | | | | | 1 | 2 | | | 3 | | 4 | | 5 | |
| **Graduate attributes**  Mark the GA’s addressed in this unit with an X)  (See syllabus pages 19 to 21) | | | | GA 11 | | | |  | |  | |  | |
| **Explain how this topic is addressed in the specific workplace.**  (Refer also to the GA’s in the Syllabus pages 19 to 21) Insert more line if needed | | | | | | | | | | | | | | |
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**OTHER TOPICS** (Make as many copies of this blank unit as necessary)

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| **TOPIC 8** |  | | | | | | | | | | | | | |
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| 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 18)  **Assessor Signature:** | | | | | 1 | 2 | | | 3 | | 4 | | 5 | |
| **Graduate attributes**  Mark the GA’s addressed in this unit with an X)  (See syllabus pages 19 to 21) | | | | GA 11 | | | |  | |  | |  | |
| **Explain how this topic is addressed in the specific workplace.**  (Refer also to the GA’s in the Syllabus pages 19 to 21) | | | | | | | | | | | | | | |
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| **Student Signature** | | | **Assessor Signature** | | | | | | | | | | | |
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**WBL - EIEXL1A**

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| **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**

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| Logocolr | **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:** | | EIEXL1A |  |
| **Instructional programmes:** | | Diploma in Electrical Engineering | |
| **Assessment:** | | Written Report | |
| **NQF Level:** | | 5 | |
| **Credits:** | | 14 | |
| **Document revision:** | | February 2021 | |

1. **Syllabus Content**
2. Learning content must include company policies, procedures, safety and professional requirements.
3. 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
4. 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.
5. 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:

* 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 the use of test equipment.
* Demonstrate the ability the use different type 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 connected to different types of field devices

**3. References**

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**4. Graduate Attributes**

**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 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.

**5. Graduate attributes assessment**

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| **Graduate Attribute 11: Workplace practices**  Demonstrate an understanding of workplace practices to solve engineering problems consistent with academic learning achieved. | |
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| Where is outcome assessed? | In the work place. |
| 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 work-place-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. |

**6. Module Credits**

**1 credit =** 30 hours work based learning

**14 credits =** 420 hours work based learning (10-11 Weeks)

**7. Module Knowledge Profile**

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