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**Training Delivery and Assessment Plan (TDAP)**

**REP C 35: Solar Photovoltaic Installations**

**ITVET Belize City**

**1.0 COURSE ADMINISTRATION:**

**Qualification CODE: XXXXXXnnnnZ**

**Qualification TITLE:** **Solar Photovoltaic Installations**

**PROGRAMS: Renewable Energy and Energy Efficiency Program (REP)**

**TRAINING CYCLE: August 29, 2022– December xx, 2022**

**Class Meeting Times: Monday (New Lab) as well as Wednesday and Friday mornings (Classroom)**

**Class Venue: New Lab as well as REP Classroom 01 / Google Classroom Platform**

**Program Instructor: Lloyd Wade**

**Consultation hours: By Class schedule**

**Telephone: ITVET Belize**: **(501) 203-4027**

**Personal cell: (501) 000-0000**

**E-Mail Address:** [**xxxxxxx@zzzzz.com**](mailto:xxxxxxx@zzzzz.com)

**Class Hours / Term: 68**

**Weeks / Term: 12**

**Classroom: Wednesday am (3 periods) and Friday am (2 periods) for 12 weeks**

**New Lab: Tues am (3 periods) plus Wed pm follow up (1 period) for 9 weeks (Weeks 3 – 11)**

**Course Description**

This course will introduce the learner to the parts and tools used to install solar panels and associated equipment. Both on-grid and off-grid applications will be explored. The focus will be on the installation and use of tools. The learner will be introduced to various mounting methods normally found in Belize. Racking techniques including equipment bonding will be identified. Learners will be exposed to the qualifications for the CVQ Level 2 Photovoltaic Installation (Roofer / Fitter).

**Rationale**

Learners will be hired to install solar PV systems. Part of the installation is the handling and mounting of the PV system. The PV system is made up of racking, PV modules and wiring components. The learners will be required to read and interpret technical drawings and manuals. They will also be expected to create reports for the installations, including commissioning reports.

**Assessment**

Tests – 15% Assignments – 25% Projects -10% Lab Work – 40 % Exam – 0 % Employability Skills - 10%

**Course Tasks:**

* Task 01 – Understand the physical make up of PV panels and the handling of them.
* Task 02 – Read drawings and manuals for the installation of PV systems.
* Task 03 – Use tools to install PV systems.
* Task 04 – Safely perform installation of PV system components on a roof surface (various configurations).
* Task 05 – Perform installation as per CVQ Level 2 Photovoltaic Panel Installation (Roofer / Fitter).
* Task 06 – Perform proper bonding techniques.

**2.0 PROFILE OF THE TRAINEE:**

1. Responsible
2. Dependable
3. Punctual
4. Proficient
5. Analytical
6. Enterprising
7. Self-confident
8. Team player
9. Technologically Oriented
10. Resourceful

**3.0 PROGRAM POLICIES AND REGULATIONS:** Trainees are expected to (by date specified):

1. Complete all assessment, assignments, reports and tests on due time.
2. Abide by the rules and regulations as stated in the trainee handbook, workshop rules, online class (netiquette).
3. Practice professional and ethical behavior at all times.
4. Competent in all practical, examination, test and or quizzes.
5. Be on time to each class period/online session. If you will be late for any session, please inform the Instructor via an e-mail, telephone, or text message.
6. Attend all scheduled class periods and online sessions in the Google Classroom assigned.
7. Show personal interest and exhibit class participation.
8. All Reading Assignments must be done prior to class/lab sessions.
9. In order to prevent plagiarism, all references used while conducting research must be cited. The American Psychological Association (APA) guidelines are the recommended format. This will be provided as a separate document and there are a number of websites that provide information on the APA format.

**4.0 TECHNOLOGY REQUIREMENTS**:

(Example text – Edit as appropriate for Course) Each trainee is required to have access to an electronic device, CD or flash drive, MSWord, Excel, and PowerPoint software and internet access as well as an up to date email address (Gmail account).

**5.0 PORTFOLIO OF THE TRAINEE:**

(Example text – Edit as appropriate for Course) At the end of each unit, each trainee is required to produce a portfolio which will contain all assignments, quizzes, reflections per unit and /or cluster, and practical assessments. In addition, for trainees to be promoted to the next level, he/she must have a **completed portfolio**. An outline of the portfolio will be provided by your instructor.

**6.0 MODES OF INSTRUCTION:**

(Example text – Edit as appropriate for Course) In this program, we will utilize both face to face and online learning (blended learning) in Google Classroom using the following methodologies: Lecture (traditional and power point methods), small and large group discussion; individual and group presentations, slide show, video presentations, interactive presentations, blogs, tutorial, community of inquiry (COI), expert teaching, and guided practical. Furthermore, you will be expected to use email and WhatsApp to respond to the course instructor and peers about assigned topics.

**7.0 INSTRUCTIONAL METHODS:**

**Face to Face Contact:**

**1.**

1. Lecture,
2. Videos
3. Practical demonstration
4. Discussion
5. Guided practice
6. Independent practice
7. Cooperative learning activities
8. Textbook and computer-based information

**2. Online Contact: (2 hrs. /Week)**

1. Google Classroom Platform
2. Zoom
3. Microsoft Office
4. Tutorials
5. PowerPoint with voice lessons
6. Videos on concepts
7. Online quizzes and tests
8. Discussion
9. Cooperative Learning Activities

**8.0 RESOURCES:**

1. Manual, Book, Industry Materials, Handouts, Powerpoint Slides
2. YouTube videos
3. Live Practice Sheets
4. Guest Lecturers

**Underpinning knowledge and Skills**

**Knowledge of:**

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**Skills**

The ability to:

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**9.0 DELIVERY SCHEDULE**

| **Date** | **Element of Competency** | **Description** | **Instructional strategies** | **Readings ,Assignments and Due Dates** | **Resources** |
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| **Week 1** | Module 1 PV panel construction  Task 01: Understand the physical make up of PV panels and the handling of them. | -Introduction/ Orientation  -Housekeeping (rules & expectations)  -Course Outline review  -Using Google meet and classroom  - Present the basic terms used in the solar industry | -Discussion  -Forum Discussion  - Peer Discussion  - Presentations  - Lecture  - Videos  - Practice Sheets | **Assignment Panel Construction** | - Rule book  -Course outline  -PowerPoint presentations  - handouts  - worksheets  - videos and You Tube  - computer |
| **Week 2** | Module 2 Racking and mounting. Sloped Roof  Task 02: Read drawings and manuals for the installation of PV systems  Task 03: Use tools to install PV systems | Power Point “Type 1 Sloped Roof” |  | **Test Panel Construction**  **Assignment Sloped roof.** | Classroom |
| **Week 3** | Module 2 Racking and mounting.  Ground Mounts  Task 02 and Task 03 | Power Point “Type 2 Ground Mounting Basics”  Power Point “Ground Mounting Considerations”  Power Point “Ground Mount Screws and Anchors” |  | **Sloped roof test**  **Assignment Ground mount anchorage** | Classroom  Use lab time to start assignment |
| **Week 4** | Module 2 Racking and mounting. Pole Mounts  Task 02 and Task 03 | Power Point “Pole Mounts” |  | **Test Ground Mount Anchorage Test**  **Test Ground Mount Test**  **Pole Mounts assignment** | Classroom  Use lab time for assignments and tests. |
| **Week 5** | Module 2 Racking and mounting. “Roof Ballast” and “Tracker Mounts”  Task 02 and Task 03 | Power Point “Roof Ballast” and “Tracking Mounting” |  | **Pole Mounts Test**  **Assignment Roof Ballast**  **Assignment Tracking Mounts** | Classroom  Use lab time for tests and assignments |
| **Week 6** | Module 3 Combiner Boxes.  Task 02 and Task 03 | Power Point “Racking Combiner Box” |  | **Test Roof Ballast**  **Test Tracker**  **Combiner Box Assignment**  **Combiner Box Test** | Classroom  Use lab time for assignments |
| **Week 7** | Module 4 Microinverters.  Task 02 and Task 03 | Power Point “Racking Microinverters” |  | **Microinverter racking assignment.** | Classroom  Use lab time for assignment. |
| **Week 8** | PV Installation Labs  Task 02, Task 03, Task 04, Task 05, Task 06. | Power Point “PV Installation Labs” |  | **Microinverter racking test.**  **Lab 1 Racking Placement** | Classroom  Use lab time for Lab 1 |
| **Week 9** | PV Installation Labs  Task 02, Task 03, Task 04, Task 05, Task 06. | Power Point “PV Installation Labs” |  | **Lab 1 Racking Placement** | Classroom  Use lab time for Lab 1 |
| **Week 10** | PV Installation Labs  Task 02, Task 03, Task 04, Task 05, Task 06. | Power Point “PV Installation Labs” |  | **Lab 2 Microinverter Mounting** | Classroom  Use lab time for Lab 2 |
| **Week 11** | PV Installation Labs  Task 02, Task 03, Task 04, Task 05, Task 06. | Power Point “PV Installation Labs” |  | **Lab 3 Module Mounting** | Classroom  Use lab time for Lab 3 |
| **Week 12** | PV Installation Labs  Task 02, Task 03, Task 04, Task 05, Task 06. | Power Point “PV Installation Labs” |  | **Lab 4 Grid Connect** | Classroom  Use lab time for Lab 4 |

* 1. **PRACTICAL GRADING CRITERIA**

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| RATING | DESCRIPTOR |
| **5**  **Competent**  Can perform the task with initiative and adaptability to problem situation. | Mastery of technical skills; can perform the task demonstrating mastery, autonomy, responsibility and control in a wide range of working conditions. Trainee applies and extends the key concepts, processes and skills. Works independently and can support the learning of others. |
| **4**  **Competent**  Can perform the task proficiently without assistance and/or supervision. | Proficient in technical skills; can perform the task in a wide range of working conditions, demonstrating good working knowledge and application of the key concepts, processes, skill, initiative, and adaptability to problem situations. Ability to work independently. |
| **3**  **Competent**  Can perform the task satisfactorily but requires periodic assistance and/or supervision. | Satisfactory technical skills; can perform the task demonstrating sufficient knowledge of the key concepts, processes, skills, and an ability to operate satisfactorily displaying some initiative and adaptability to problem situations. Works with some support. |
| **2**  **Not Yet Competent**  Can perform some parts of the task but requires considerable assistance. | Insufficient technical skills; can perform limited parts of the task but not to required standards. Trainee is well below the course level expectations and performance is inconsistent even with support. |
| **1**  **Not Yet Competent**  Cannot perform the task but has some knowledge of the task. | Inadequate evidence of attainment of competence, processes,and skill on which a judgment can be made. |

**11.0 THEORY GRADING CRITERIA**

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| RATING | DESCRIPTOR |
| **90-100 Excellent**  Can insightfully and creatively apply an in-depth understanding of learning standards in complex situations. | Mastery of the related knowledge and attitude; trainee develops a sophisticated understanding of the concepts and competencies relevant to the expected learning. |
| **80 -89 Very good**  Can transfer understanding of learning standards to both predictable and new situations. | Proficient in the related knowledge and attitude; trainee demonstrates a complete understanding of the concepts and competencies relevant to the expected learning. |
| **70 -79 Satisfactory**  Can understand the learning standards in basic or familiar situations. | Satisfactory level of the related knowledge and attitude; trainee demonstrates a partial understanding of the concepts and competencies relevant to the expected learning. |
| **57-69 Unsatisfactory**  Can demonstrate some progress towards the learning standards. | Insufficient knowledge and attitude; trainee demonstrates an initial understanding of the concepts and competencies relevant to the expected learning. |
| **Below 57 Insufficient**  Progress is not shown. | Has not demonstrated sufficient knowledge and attitude on which a judgment can be made |