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

**REP C 44: Battery Based PV Installations**

**ITVET Belize City**

**1.0 COURSE ADMINISTRATION:**

**Qualification CODE: XXXXXXnnnnZ**

**Qualification TITLE:** **Battery Based PV 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: TBA**

**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 battery-based PV installations. It covers both flooded and non-flooded battery types. Manufacturers will provide guidance on the handling, installation, and maintenance of their batteries. In Belize the flooded battery type is the most common. The sealed and Lithium are gaining popularity. This course covers unique properties of each type. The labs associated with this lab are very hands on and require more lab time than other courses. Classroom settings will be required in the lab. This course runs synchronously with the Stand-Alone course.

**Rationale**

Batteries are the heart of stand-alone electric systems. Batteries are also being used in grid connected systems as well but not as popular. This course introduces the learner to the handling, installation, and maintenance. The learner will learn and perform industry maintenance procedures. The learner will perform the installation of a 48 Volt battery bank in the campus lab area. The battery bank will be connected to an inverter / charger for controlled charging and discharging for learning.

**Assessment**

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

**Course Tasks:**

Task 01: Identify additional elements of a battery site‐specific safety plan

Task 02: Identify the elements of battery installation

Task 03: Identify the elements of charging and inverting component installation

Task 04: Identify the elements of energy storage component installation

Task 05: Identify the elements of the system commissioning procedure

**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** | Task 01  Safety equipment introduction for battery handling.  This includes battery placement and places where they should not be placed. | -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 | **SDS Safety Data Sheet for Battery.**  **PPE manual reading.** | - Rule book  -Course outline  -PowerPoint presentations  - handouts  - worksheets  - videos and You Tube  - computer |
| **Week 2** | Task 02: Identify the elements of battery installation | Power Point “Battery Based PV Installations |  |  | Classroom time |
| **Week 3** | Task 04: Identify the elements of energy storage component installation | Power Point “Battery Based PV Installations |  |  | Classroom time |
| **Week 4** | Task 04: Identify the elements of energy storage component installation | Power Point “Battery Based PV Installations Lab Activities |  |  | Lab#1 Receiving and shipping Flooded Lead Acid Batteries |
| **Week 5** | Task 04: Identify the elements of energy storage component installation | Power Point “Battery Based PV Installations Lab Activities |  |  | Lab#2 Installation of Flooded Lead Acid Batteries |
| **Week 6** | Task 04: Identify the elements of energy storage component installation | Power Point “Battery Based PV Installations Lab Activities |  |  | Lab#2 Installation of Flooded Lead Acid Batteries |
| **Week 7** | Task 04: Identify the elements of energy storage component installation  Task 05: Identify the elements of the system commissioning procedure | Power Point “Battery Based PV Installations Lab Activities |  |  | Lab#2 Installation of Flooded Lead Acid Batteries |
| **Week 8** | Task 03: Identify the elements of charging and inverting component installation  Task 04: Identify the elements of energy storage component installation  Task 05: Identify the elements of the system commissioning procedure | Power Point “Battery Based PV Installations  Power Point “Battery Based PV Installations Lab Activities |  |  | Lab#2 Installation of Flooded Lead Acid Batteries |
| **Week 9** | Task 03: Identify the elements of charging and inverting component installation  Task 04: Identify the elements of energy storage component installation  Task 05: Identify the elements of the system commissioning procedure | Power Point “Battery Based PV Installations  Power Point “Battery Based PV Installations Lab Activities |  |  | Lab #3 Monthly Maintenance for Flooded Batteries |
| **Week 10** | Task 03: Identify the elements of charging and inverting component installation  Task 04: Identify the elements of energy storage component installation  Task 05: Identify the elements of the system commissioning procedure | Power Point “Battery Based PV Installations  Power Point “Battery Based PV Installations Lab Activities |  |  | Lab #3 Monthly Maintenance for Flooded Batteries  Lab #4 Quarterly Maintenance for Flooded Batteries |
| **Week 11** | Task 03: Identify the elements of charging and inverting component installation  Task 04: Identify the elements of energy storage component installation  Task 05: Identify the elements of the system commissioning procedure | Power Point “Battery Based PV Installations  Power Point “Battery Based PV Installations Lab Activities |  |  | Lab #3 Monthly Maintenance for Flooded Batteries  Lab #4 Quarterly Maintenance for Flooded Batteries |
| **Week 12** | None | Test |  | Test |  |

* 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 |