Training Delivery and Assessment Plan (TDAP)
REP C 22: Energy Modeling and Analysis

ITVET Belize City

1.0 COURSE ADMINISTRATION:

Qualification CODE:	**XXXXXXnnnnZ**
Qualification TITLE:	**Energy Modeling and Analysis**
PROGRAMS:	**Renewable Energy and Energy Efficiency Program (REP)**
TRAINING CYCLE:	**April 17, 2023 – June xx, 2023**
Class Meeting Times:	**Tuesday - Thursday mornings (Classroom triple period) and Thursday afternoon (last period)**
Class Venue:	**REP Classroom**
Program Instructor:	**Mr. Gilroy Banner**
Consultation hours:	**By Class schedule**
Telephone:	**ITVET Belize: (501) 203-4027**
Personal cell:	**(501) 000-0000**
E-Mail Address:	**xxxxxxx@zzzzz.com**
Class Hours / Term:	**46.7**
Weeks / Term:	**10**
Classroom:	**46.7 hours = 10 weeks x 7 periods (40 minutes / period) / Week**
New Lab:	**0 hours**

Course Description

This course reviews some significant energy consumption terms and concepts, and exercises in unit conversions. General energy use in buildings is reviewed, and how this might change with different materials and habits. Equations and calculation exercises – by hand with a calculator and with a computer spreadsheet function – are a basis for general models describing a circumstance. Changing some variable values, and recalculating the outcomes, builds an appreciation of the relative significance of some changes on the modeled energy use. Changes could include different building materials, their characteristics, building and energy usage habits, and site conditions. There are available online information sources that can aid in making working assumptions, as "perfect information" is often prohibitively expensive. With a better understanding of general energy models and analysis, one can better form relevant general opinions about energy efficient upgrades for existing buildings. As better quality information about a site is available, models can be refined; uncertainties reduced, and better decision making results.

Rationale

Understanding the equations, calculations, and applications of general energy modeling and analysis in this course, prepares one for a future course involving applying these with measured or reasonably assumed information for a site. An introduction to energy modeling and analysis provides a basis for understanding the design loads and influences on them that can impact project decision making – technical, social and financial.

Assessment

Tests – 20% Assignments – 30% Projects -40% Lab Work – 0 % Exam – 0 % Employability Skills - 10%

Course Tasks:

- Task 01: Understand energy consumption in building systems.
- Task 02: Energy use in residential building systems and applications
- Task 03: Prepare opinions on cooling energy loads using hand calculations and available software models.
- Task 04: Understand typical building designs, common building materials, and their impact on associated comfort.
- Task 05: Identify energy efficient upgrades for existing buildings

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.

- **A.** Lecture,
- **B.** Videos
- **C.** Practical demonstration
- **D.** Discussion
- **E.** Guided practice
- **F.** Independent practice
- **G.** Cooperative learning activities
- **H.** Textbook and computer-based information

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

A. Google Classroom Platform
B. Zoom
C. Microsoft Office
D. Tutorials
E. PowerPoint with voice lessons
F. Videos on concepts
G. Online quizzes and tests
H. Discussion
I. 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
Week 1	Task 01: Understand Energy Consumption in building systems Task 02: Energy Use in Residential Buildings and Applications	-Introduction/ Orientation -Housekeeping (rules & expectations) -Course Outline review -Using Google meet and classroom - Present useful terms	-Discussion -Forum Discussion - Peer Discussion - Presentations - Lecture - Videos - Practice Sheets		- Rule book - Course outline - power point presentations - handouts - worksheets - videos and You Tube - computer
Week 2	Task 01: Understand Energy Consumption in building systems Task 02: Energy Use in Residential Buildings and Applications	Unit conversions Conductance Heat, Lights, Equipment Electricity & Low Carbon WUFI & Passive House		**Test 01 – 12% T1 (part 1)** **Assignment 01 – 7% T2**	

Date	Element of Competency	Description	Instructional strategies	Readings, Assignments and Due Dates	Resources
Week 3	Task 02: Energy Use in Residential Buildings and Applications Task 03: Prepare opinions on cooling energy loads using hand calculations and available software	WUFI & Passive House Hand Calculations		**Test 01 – 12% T1 (part 2)** **Assignment 02 – 7% T2**	
Week 4	Task 02: Energy Use in Residential Buildings and Applications	RETScreen Version 4 Software Applicaton RETScreen Version 4 From C34 and C35		**Group Project 01 – 4% T2**	
Week 5	Task 02: Energy Use in Residential Buildings and Applications Task 03: Prepare opinions on cooling energy loads using hand calculations and available software	Engineering Analysis Hand Calculations		**Group Project 02 – 6% T2**	

Date	Element of Competency	Description	Instructional strategies	Readings, Assignments and Due Dates	Resources
Week 6	Task 02: Energy Use in Residential Buildings and Applications Task 03: Prepare opinions on cooling energy loads using hand calculations and available software	Engineering Analysis Hand Calculations		**Assignment 03 – 8% T3**	
Week 7	Task 02: Energy Use in Residential Buildings and Applications Task 03: Prepare opinions on cooling energy loads using hand calculations and available software	Engineering Analysis Hand Calculations		**Group Project 03 – 15% T2** **Assignment 04 – 8% T3**	
Week 8	Task 04: Understand typical building designs, common building materials, and their impact on associated comfort. Task 05: Identify energy efficient upgrades for	BuildingScience.com Building Section Designs		**Group Project 05 – 7% T4**	

Date	Element of Competency	Description	Instructional strategies	Readings, Assignments and Due Dates	Resources
	existing buildings.			**Test 02 - 8% T5**	
Week 9	Task 04: Understand typical building designs, common building materials, and their impact on associated comfort.	Humidity, Vapour Barrier, Temperature and Moisture flow calculations		**Group Project 04 – 8% T4**	
Week 10	Course Review and Conclusion				

10.0 PRACTICAL GRADING CRITERIA

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	Satisfactory technical skills; can perform the task demonstrating sufficient knowledge of the

Competent Can perform the task satisfactorily but requires periodic assistance and/or supervision.	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

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