



Electrical Technology Program
Student Learning Outcome Mapping
Course (CLO), Program (PLO), Institutional (ILO)

Program Description: This program is designed to provide students with technical knowledge, skills, and proper work habits/attitudes necessary for employment in this field. The program prepares students to work and advance in their careers in positions such as electricians, electrical maintenance personnel or power distribution personnel.

Program Learning Outcomes	Institutional Learning Outcomes
<ol style="list-style-type: none"> 1. Be employable in power utility companies as linemen, power plant electricians or maintenance personnel. 2. Install and maintain electrical wiring for residential buildings. 3. Install and maintain electrical wiring in commercial and industrial buildings. 	<ol style="list-style-type: none"> 1. Critical Thinking and Problem Solving: Analyze and solve problems by using informed judgment based on evidence, sound reasoning, and/or creativity to differentiate facts from opinions and to specify solutions and their consequences. 2. Communication: Effectively communicate, both orally and in writing, thoughts in a clear, well-organized manner to persuade, inform and/or convey ideas in academic, work, family and community settings. 3. Quantitative and Technological Competence: Use mathematical skills appropriate to our technological society by analyzing and solving problems that are quantitative in nature and use technology for informational, academic, personal and professional needs. 4. Diversity: Understand and appreciate differences in cultures and behaviors between the self and others by demonstrating respect, honesty, fairness, and ethical principles in both personal and professional life. 5. Civic Responsibility: Apply the principles of civility and morality to situations in the contexts of a healthy family, work, community, environment and world. 6. Aesthetics: Apply numerous means of inquiry to experience and appreciate the values of arts and nature.

PLO-ILO Mapping

PLOs	ILOs					
	ILO 1	ILO 2	ILO 3	ILO 4	ILO 5	ILO 6
PLO 1	X	X	X	X	X	X
PLO 2	X	X	X	X	X	X
PLO 3	X	X	X	X	X	X

CLO-PLO-ILO Mapping

BP 116 - Blueprint Reading for Electricians

This course is designed to enable students to learn electrical blueprint reading and at the same time receive exposure to and become familiar with applicable sections of the most recent National Electrical Code (NEC). It covers single and multi-family dwellings; commercial, industrial, specialized and hazardous locations.

CLO	PLO				ILO					
	PLO 1	PLO 2	PLO 3		ILO 1	ILO 2	ILO 3	ILO 4	ILO 5	ILO 6
Students will be able to:										
1. Read and interpret electrical blueprint based on the NEC requirements.	X	X	X		X	X				
2. Calculate the loads for single and multi-family dwelling installations and identify electrical devices and materials used.	X	X	X		X		X			
3. Calculate loads for commercial and industrial installations and identify devices and materials used.	X	X	X		X		X			
4. Identify hazardous locations and determine the methods used to reduce the hazard.	X	X	X		X		X			
5. Design an electrical blueprint using computer assisted software.	X	X	X		X			X	X	X

ET 103 - Mathematics for Electrical and Electronics

This course is designed to fulfill mathematical needs of students taking electrical technology and general electronics technology. It covers unit conversion, Ohm's Law, Kirchoff's Law, Power Law, power and energy calculations, wire resistance and voltage drops, AC circuit calculations, AC power and power factor calculations.

CLO Students will be able to:	PLO				ILO					
	PLO 1	PLO 2	PLO 3		ILO 1	ILO 2	ILO 3	ILO 4	ILO 5	ILO 6
1. Demonstrate ability to convert unit from one form to another.	X	X	X		X		X			
2. Demonstrate ability to calculate problems involving Ohm's Law, Kirchoff's Law, and power law.	X	X	X		X		X			
3. Estimate electrical energy consumed through the given loads and power rating.	X	X	X		X		X			
4. Demonstrate ability to calculate wire resistance and voltage drops.	X	X	X		X		X			
5. Demonstrate ability to calculate problems involving resistance, inductance and capacitance in AC circuits.	X	X	X		X		X			
6. Demonstrate ability to calculate alternating current power and power factor.	X	X	X		X		X			

ET 110 - Basic Electrical Wiring for Non-Majors

This course is designed to provide non-electrical major students with technical knowledge and skills relevant in construction sites. It deals with fundamental concepts of electricity to practical skills required in the workplace. It covers basic safety practices in dealing with electrical works, proper use of basic electrical hand tools, electrical devices and protections, connecting and installing simple electrical circuits and basic wiring for single-family dwelling unit.

CLO Students will be able to:	PLO				ILO					
	PLO 1	PLO 2	PLO 3		ILO 1	ILO 2	ILO 3	ILO 4	ILO 5	ILO 6
1. Apply electrical theories and principles in electrical wiring installation.		X			X		X			
2. Measure unknown electrical quantities using electrical measuring instruments.		X			X		X			
3. Splice/Join electrical conductors according to National Electrical Code.		X			X		X			
4. Install lighting fixtures according to plans and specifications.		X			X		X			
5. Install electrical wiring for single family dwelling unit using sheathed non-metallic cable according to plans and specifications.		X			X		X			

ET 111 - Basic Electricity

This course introduces fundamental concepts, theories, and principles necessary for a successful career in electrical installation. It deals with construction, analysis and verification of AC and DC circuits necessary for electrical careers. It trains students with blending concepts relating to electrical theories and practical information commonly encountered in electrical works.

CLO Students will be able to:	PLO				ILO					
	PLO 1	PLO 2	PLO 3		ILO 1	ILO 2	ILO 3	ILO 4	ILO 5	ILO 6
1. Apply electrical theories and principles in electrical circuits.	X	X	X		X	X				
2. Determine values of resistors/capacitors through color coding.	X	X	X		X		X			
3. Measure unknown electrical quantities using electrical measuring instruments.	X	X	X		X		X			
4. Splice/Join electrical conductors according to National Electrical Code.	X	X	X		X		X			
5. Connect battery/capacitors in series or parallel to suit for voltage and current capacity requirements.	X	X	X		X		X			

ET 121 - Electric Machines

This course provides technical knowledge and skills necessary in dealing with electric machines. It consists of theories and operating principles of transformers, motors, and generators. Specifically, it deals with connecting, installing, troubleshooting and repairing of transformers, motors, and generators. Appropriate CAI will be used.

CLO Students will be able to:	PLO				ILO					
	PLO 1	PLO 2	PLO 3		ILO 1	ILO 2	ILO 3	ILO 4	ILO 5	ILO 6
1. Rewind transformer.	X		X		X		X			
2. Perform Transformer banking.	X		X		X		X			
3. Troubleshoot and repair capacitor motor.	X		X		X		X			
4. Troubleshoot and repair three-phase motors.	X		X		X		X			
5. Troubleshoot and repair generator.	X		X		X		X			
6. Perform corrective and preventive maintenance of electric machines.	X		X		X		X			

ET 122 - Residential Wiring

This course provides the students with a comprehensive and practical approach to become successful residential electricians. It covers practical wiring experience in connecting and installing various types of branch circuits and services for lighting, heating, burglar alarms, and power for typical single-family dwelling units to multiple-family residential units. More specifically, it covers important concepts like planning a job, roughing in and trim out, ground fault circuit interrupters, and maintaining/troubleshooting a residential electrical wiring system in accordance with the latest edition of National Electrical Code. It also deals with installing, commissioning, operating, troubleshooting, repairing, and maintaining small stand-alone solar PV systems. Appropriate CAI will be used.

CLO	PLO			ILO					
	PLO 1	PLO 2	PLO 3	ILO 1	ILO 2	ILO 3	ILO 4	ILO 5	ILO 6
Students will be able to:									
1. Install service entrance and lateral conductors.		X		X		X			
2. Install electrical wiring, communication and alarm system in residential unit according to plans and specifications.		X		X		X			
3. Perform roughing-in, trim-out and install wiring devices and lighting fixtures.		X		X		X			
4. Commission, troubleshoot, repair and maintain residential electrical wiring system.		X		X		X			
5. Install, commission, operate, troubleshoot, repair and maintain small stand-alone solar PV system.		X		X		X	X	X	X

ET 210 - Motor Controls and Sequential Controllers

This course provides technical knowledge and skills relevant to industrial applications. It applies real world step-by-step approach to all aspect of motor controls and sequential controls, which includes basic control circuits, sensing devices and other control devices commonly used in industrial controls and installations. It also enables the students to learn to draw and interpret schematic/ladder and wiring diagrams, connect, install, troubleshoot, repair and maintain motor controls and sequential controllers. Appropriate CAI will be used.

CLO	PLO			ILO					
	PLO 1	PLO 2	PLO 3	ILO 1	ILO 2	ILO 3	ILO 4	ILO 5	ILO 6
Students will be able to:									
1. Install magnetic full-voltage starter.	X			X		X			
2. Install reduce voltage starter.	X			X		X			
3. Install wye-delta starter.	X			X		X			
4. Install sequential/compelling controls.	X			X		X			
5. Apply typical approaches in troubleshooting, repairing and maintaining motor control circuits.	X			X			X	X	

ET 211 - Industrial/Commercial Wiring

This course covers technical knowledge and skills relevant to the performing of critical tasks and responsibilities of commercial and industrial electricians. It covers installation of electrical service, feeders and branch circuits, power and lighting; special new construction systems of commercial and industrial establishments based on the industry standards and procedures. Appropriate CAI will be used.

CLO Students will be able to:	PLO				ILO					
	PLO 1	PLO 2	PLO 3		ILO 1	ILO 2	ILO 3	ILO 4	ILO 5	ILO 6
1. Design electrical installation requirements for a given load for commercial/industrial building.	X		X		X	X		X	X	X
2. Install electrical wiring for commercial/industrial establishment.	X		X		X		X			
3. Install service equipment and service entrance for commercial/industrial establishment.	X		X		X		X			
4. Install intercom system/telephone system for commercial buildings.	X		X		X		X			
5. Determine transformer type and size for commercial/industrial installation.	X		X		X		X			
6. Troubleshoot, repair and maintain industrial/commercial wiring system.	X		X		X	X		X	X	X

ET 214 - Grid Connected PV Systems, Design and Installation

This course covers technical knowledge and practical skills relevant in designing, installation, troubleshooting, repair and maintenance of grid connected solar photovoltaic system. It deals with designing a PV generating system according to customer's need and requirements. It includes undertaking one or two simulated installations on dummy roof or ground mounted PV arrays. It also deals with safety work practices applicable to sustainable energy industry.

CLO Students will be able to:	PLO				ILO					
	PLO 1	PLO 2	PLO 3		ILO 1	ILO 2	ILO 3	ILO 4	ILO 5	ILO 6
1. Design grid-connected PV system according to customer's requirement.	X		X		X		X			
2. Prepare PV system documentation.	X		X		X	X	X			
3. Install grid-connected PV systems.	X		X		X		X			
4. Test and commission grid-connected PV system.	X		X		X		X			
5. Troubleshoot, repair and maintain grid-connected PV system.	X		X		X		X			

ET 221 - Electrical Estimating

This course provides a comprehensive approach to preparation of accurate competitive electrical estimates for building trades. It includes take off procedures using electrical, mechanical and architectural prints, lighting design, labor and material cost, evaluation techniques and specifications. Appropriate CAI will be used.

CLO	PLO				ILO					
	PLO 1	PLO 2	PLO 3		ILO 1	ILO 2	ILO 3	ILO 4	ILO 5	ILO 6
Students will be able to:										
1. Apply best practices in electrical estimating.	X	X	X		X	X	X	X	X	X
2. Develop labor unit through previous data, trends and experiences.	X	X	X		X		X			
3. Perform electrical estimate in accordance with the given electrical plan.	X	X	X		X	X	X	X	X	X

ET 222 - Internship

This course is designed to provide students practical experience in the field of electricity. Individual students in the program will be placed in a private or public firm in Palau. The training agreement will be made between the employer, the student, and the college that will integrate the student's learning objectives into the training program to enhance the student's skill.

CLO	PLO				ILO					
	PLO 1	PLO 2	PLO 3		ILO 1	ILO 2	ILO 3	ILO 4	ILO 5	ILO 6
Students will be able to:										
1. Demonstrate proper employee behaviors and work habits.	X	X	X		X	X	X	X	X	X
2. Perform task in the field of electrical technology as assigned by a site supervisor.	X	X	X		X	X	X	X	X	X