College of Micronesia-FSM

Career Technical Education

Propose Program Modification of Associate of Applied Science Degree

Building Technology major Construction Electricity

November 2022

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Background of CTEC Vocational Education Program

The career and technical training divisions of COM-FSM are learning communities dedicated to creating a high quality workforce through educational excellence and student success in collaboration with its diverse communities. The goals of the division are to (1) create and provide quality technical and career instructional programs, courses, and experiences that foster student learning consistent with workforce needs; (2) foster a positive college climate that supports learning, communication, recognition, and collaboration among a diverse faculty and student body; (3) provide instructional, administrative, and student support services to enable COM-FSM to meet the goal of creating a quality workforce; (4) support and expand responsive services that provide student access into COM-FSM technical and career programs and courses and promote success within a diverse student body; (5) develop and foster partnerships with business, industry, labor, employment and training agencies, and other educational institutions; (6) promote COM-FSM technical and career program development through public relations and marketing activities, and business and industry contacts; (7) attract and develop quality and diverse personnel committed to the goals of excellence and workforce skill standards; (8) maintain current and accessible facilities and equipment, and acquire emerging technologies for the learning and work environments; and (9) promote continuous quality improvement in all COM-FSM technical and career activities and services, formal on-the-job (OJT) under the guidance of a skilled worker or journey worker and technical class

The associate of applied science (A.A.S.) degrees at COM-FSM are designed as at least a two-year technical occupational professional degree, consisting of a minimum of 60 semester credits, which provides students with skills and competencies for gainful employment. This degree is not intended nor designed for transfer directly into a baccalaureate program, but may include some baccalaureate level course offerings. The A.A.S. degree programs incorporate multiple exit points when possible; awarding of certificates and advanced certificates. Students must meet the entrance requirements for an associate degree to be admitted into the A.A.S. degree programs.

The Certificate of Achievement in Construction Electricity was approved in 1998 giving the vocational division full authority to implement the said program. Then in 2003, the Associate of Applied Science Degree in Building Technology Major in Construction Electricity was approved giving students in the certificate level the opportunity to further their education in the electrical field.

Rationale of Modifying the Associate of Applied Science Degree in Building Technology major in Electrical

Since the implementation of AAS Building Technology a number of students from the high schools were attracted to take the course due to its continuity of their electrical class in the high schools. As the years passed, and the coming of the new technologies, it's now eminent that the word "construction" means to the younger ones are no longer attractive to them. Instead they opted to take courses that are considered white collar jobs.

Due to the declining interest of students registering in the program, and based on the previous Program Reviews suggestions, it is clear that the program needs to be modified to keep abreast with the current technology in the trade.

In 2019, the European-Pacific Technical Vocational Education and Training (Eu-PacTVET) under the Secretariat of the Pacific Communities (SPC) made a collaboration with Career Technical Education Center (CTEC) joint agreement to institutionalize in our electrical program specifically our Certificate of Achievement in Construction Electricity and Associate of Applied Science Degree in Building Technology major in Construction Electricity the Renewable Energy Technology (RET). This agreement was signed in 2020 as a grant to CTEC Electrical program in the form of training equipment, instructional materials and instructor training.

As part of the college commitment to the agreement, we submitted a program modification for Certificate in Construction Electricity (CA-CE) embedded renewable energy courses into the existing program. Courses were modified and aligned to the required competency skills in-demand and certification in the pacific region. After the approval of the CA-CE modification which is the entry level to pursue their career to AAS degree, the AAS Building Technology in Construction Electricity needs to be upgraded for better alignment of the two programs.

This program modification proposal is part of our agreement and as commitment to the college mission's continuous instructional learning improvement. Reasons and justification in modifying the program are all stated in the program modification request form as reference. Hoping that this modification will improve and attract recruitment of students into renewable energy technology.

AAS Degree in Building Technology major in Construction Electricity
With PROPOSED MODIFICATIONS (AAS Degree in Building Technology major in Electrical)

Program Title:	**Division:**	**Initiator:**
Associate of Applied Science Degree in Building Technology major in Electrical	CTEC	Cirilo B. Recana - Instructor

Program Mission: (no changed)

The AAS in Building Technology major in Electrical is dedicated to the college mission in providing academic, career and technical educational programs. This program prepares students for employment in the electrical trades by providing knowledge to students and developing skills to enter a competitive skilled workforce.

New Program Description:

The AAS in Building Technology major in Electrical offers academic coursework necessary for more advanced study and experiential development of skills in the electrical trade. Students are introduced to theory, installation practices, troubleshooting and maintenance of solid-state devices, electrical machines, motors, controls and solar photovoltaic systems.

New Program Goals:

This program is designed to develop technical skills and practical experience to prepare students for positions as electrical technicians. Students will be introduced to theory, wiring practices, installation, troubleshooting and maintenance of electronic devices, electrical machines, motor controls and solar photovoltaic (PV) systems.

New Program Student Learning Outcomes:

1. Demonstrate proper use and maintenance of various hand and power tools used by electricians that comply with industry safety standards.
2. Develop knowledge and skills through experimentation and calculation of electrical quantities of electrical circuits.
3. Demonstrate knowledge and skills required in electrical wiring systems in compliance with current electrical codes and standards.
4. Demonstrate competency in repair, installation and maintenance of electrical machines, solar photovoltaic systems and solid-state devices.
5. Demonstrate ability to perform installation and troubleshooting of motors and controls.

New Program Entry Requirements:

Students entering the AAS Degree in Building Technology major in Electrical must meet COM-FSM entrance test (COMET) before admittance. Likewise, students who are admitted in the Certificate program must complete all required Technical and General Education courses in the Certificate of Achievement in Construction Electricity (CA_CE) to continue to AAS degree in Building Technology major in Electrical without re-taking the COMET.

New Suggested Program Requirements:

Note: Checklist shows the transferable course requirements of CA in Construction Electricity required to AAS Degree in Building Technology major in Electrical.

Certificate of Achievement in Construction Electricity **Courses**	**Credits**	Transferable Courses from Certificate of Achievement (CA_CE)	Required Courses in Associate of Applied Science (AAS) Degree
Technical Requirements: *CE102 Electrical/Electronic Drawing and Sketching*	3	✔	✔
CE 103 Basic Electricity I (Lecture/Lab)	3	✔	✔
CE 104 Basic Electricity II (Lecture/Lab)	3	✔	✔
CE 110 Workshop Practices (Lecture & Lab)	3	✔	✔
CE 111 Electrical Wiring I (Lecture)	3	✔	✔
CE 112 Electrical Wiring II (Workshop)	3	✔	✔
CE 121 Workshop Health and Safety (Lecture/Workshop)	5	✔	✔
Gen. Ed. Requirements: ESL 089 Reading V (3); ESL 099 Writing V (3); MS 094 Introduction to Technical Math (4) CA 095 Computer Literacy (3)	13	✔	✔
CE 150 Cooperative Education (Required Elective CA-CE and Degree bound AAS BT Program)	4	✔	✔
Total Credits Required in CA Construction Electricity (Exit 1)	**39**		
Transfer of Allowable Credits			**35**
AAS Degree in Building Technology - Electrical			
Major Requirements: VEE 222 Discrete Device II (Lecture/Lab)	3		✔
BTE 212 National Electrical Code (Lecture)	3		✔
VEE 266 Rotating Machinery (Lecture/Lab)	3		✔
BTE 230 PV: Design Principles and Installation (Lecture & Workshop)	4		✔
BTE 240 Industrial Wiring (Lecture & Workshop)	4		✔
Gen. Ed. Requirements: EN 123 Technical Communication (3); Science with Lab (4); MS 104 Technical Math I (4); CA 100 Computer Literacy (3); Exercise Sport Science (1)	**15**		✔
Total Credits Required in AAS BT-Electrical (Exit 2)	***32***		

Graduation Requirements			***72***

Suggested Schedule:

Fall	**Credit**	Mode of Instruction/ Contact Hours		**Total Contact Hours**	**Spring**	**Credit**	Mode of Instruction/ Contact Hours		**Total Contact Hours**
		Lec	**Lab**				**Lec**	**Lab**	
EN 123	3	3		3	MS 104	4	3	3	6
CA 100	3	3		3	Science w/lab	4	3	3	6
VEE 222	3	3		3		1		1	1
VEE 266	3	3		3	ESS	**4**	3	3	**6**
BTE 212	**3**	3		**3**	***BTE 230*** ***BTE 240***	**4**	3	3	**6**
Total	15			15	Total	17			25

New Course Code and Descriptions for the BTE major course requirements		
New Course Code	**Course Name**	**Description**
BTE 212 (3 credits) 3 hrs. Lecture	National Electrical Code (NEC)	This course is designed to introduce students to the National Electrical Code. The students will develop the competency in finding specific articles related to the correct methods of installing wiring and equipment. The course aims at developing work practices that comply with the National Electrical Code. To advance to the next level, the student must demonstrate proficiency to at least grade "C" level.

BTE 230 (4 credits) 3 hrs. Lecture 3 hrs. Workshop	PV: Design Principles and Installation	This course will introduce the students to solar photovoltaic (PV) for off-grid (stand-alone) and on-grid systems. It is designed to acquire basic knowledge and experience in designing and installation of solar PV components such as PV module, Charged controller, Inverter, Battery banks and Wiring system. Students will also be expected to acquire skills during their hands-on activities using proper tools, equipment and safety practices. To be competent, the student must demonstrate proficiency to at least "C" grade level.
BTE 240 (4 credits) 3 hrs. Lecture 3 hrs. Workshop	Industrial Wiring: Motor Control	This course is designed to introduce students to the fundamental concepts, principles, and devices involved in industrial control of motors. Students will also develop the skills necessary for wiring basic motor control and selecting the required pilot devices and safety components. Also includes troubleshooting motor circuitry and understanding Article 430 of NEC. The student must demonstrate proficiency to at least grade level "C".
Note: All these courses was already submitted to Instructional Coordinator (IC) of CTEC for review and comments.		

Matrix of PSLO and CSLO

Course Name	PSLO 1	PSLO 2	PSLO 3	PSLO 4	PSLO 5
VEE222 Discrete Devices II	CSLO 1-3 (I, D)	CSLO 1-3 (I, D)		CSLO 4-5 (D)	
BTE 212 National Electrical Code			CSLO 1-3 (I, D)	CSLO 5-6 (D, M)	CSLO 5-6 (D, M)
VEE 266 Rotating Machinery	CSLO 1-2 (I, D)	CSLO 1-2 (I, D)		CSLO 1-3 (I, D)	CSLO 4-5 (D, M)
BTE 230 PV: Design Principles and Installation		CSLO 1-2 (I, D)	CSLO 1-3 (I, D)	CSLO 1-3 (I, D, M)	

BTE 240 Industrial Wiring: Motor Control	CSLO 1-3 (I, D)		CSLO 4-6 (I, D, M)		CSLO 1-6 (I, D, M)

Narratives for CSLO's competency level.
I- Introduced (The emphasis is on lecture and discussion of concept and theory of the topic)
D – Demonstrated (The student should be able to re-demonstrate the task as shown by their instructor)
M – Mastery at a level appropriate for graduation (The student should be able to apply the theory and hands-on / activity procedure and experiment as supervised by the instructor)

Proposed ISLO's and PSLO's Assessment Matrix for AAS in Building Technology - Electrical

ISLO & PSLO Assessment Matrix

ISLO 1: Effective oral communication
ISLO 2: Effective written communication
ISLO 3: Critical thinking
ISLO 4: Problem solving
ISLO 5: Intercultural knowledge and competence
ISLO 6: Information literacy
ISLO 7: Foundations and skills for life-long learning
ISLO 8: Quantitative learning

AAS_BTE	ISLO 1	ISLO 2	ISLO 3	ISLO 4	ISLO 5	ISLO 6	ISLO 7	ISLO 8
PSLO 1	CE 121						CE 110 CE111	
PLSO 2	CE 103 CE 104			CE102				CE 103 CE 104
PSLO 3		BTE 212	CE 121 BTE 212			CE 121 BTE 212 BTE 240 BTE 230	CE 111 CE 112	
PSLO 4							VEE 222 BTE 230	
PSLO 5							VEE 266 BTE 240	

Rationale on ISLO and PSLO Matrix for BTE major course requirements:

- ISLO 2 is link to PSLO 3 as part of the course activities in BTE 212 where the students will identify safe wiring practices and standards in compliance with current electrical codes. A worksheets will be used to assess students' performance in identifying codes and standards in the National Electrical Code book.
- ISLO 3 is link to PSLO 3 as part of the course activities in BTE 212 where the students will describe safe wiring practices in compliance with current electrical codes and standards. A worksheets will be used to assess students' performance in identifying codes and standards in the National Electrical Code book.

- ISLO 6 is link to PSLO 3 as part of the course activities in BTE 212, 230 and 240 where the students will describe safe wiring practices in compliance with current electrical codes and standards, Introduce them to wiring and materials needed in the installation of PV systems and motor controls. A worksheets will be used to assess students' performance in identifying codes and standards in the National Electrical Code book.
- ISLO 7 is link to PSLO 4 as part of course activities in BTE 230 where the students will demonstrate competency in repair, installation and maintenance of solar photovoltaic systems. A performance checklist will be used to assess the students.
- ISLO 7 is link to PSLO 4 as part of course activities in BTE 240 where students will demonstrate ability to perform installation and troubleshooting of motors and controls. Students' troubleshooting skills will be assessed.

Approved Nov. 30, 2022 By

Lynn Sipenuk
Chair
Curriculum Committee