Engineering Technology Program (ENGT)

2019
ANNUAL REPORT OF PROGRAM DATA

UNIVERSITY of HAWAI'I®
MAUI COLLEGE

1. Program Description

a) Statement and brief description of the program including a listing of the program level Student Learning Outcomes (SLOs).

Description
The Engineering Technology program which leads to a Bachelor of Applied Science degree provides curriculum and extensive hands-on training in electronics, computers, optics, remote sensing, and other technologies required for employment in local and regional high tech companies and industries.

Program level Student Learning Outcomes
PLO1: analyze, design, and implement electro-optic systems, control systems, instrumentation systems, communication systems, computer systems, or power systems;
PLO2: apply project management techniques to electrical/electronic(s) and computer systems;
PLO3: utilize integral and differential calculus, or other appropriate mathematics above the level of algebra and trigonometry to solve technical problems;
PLO4: demonstrate critical engineering technology skills and experiences such as: making existing technology operate, creating/selecting new technology, troubleshooting, calibrating, characterizing, and optimizing;
PLO5: demonstrate engineer's way of thinking, analyzing technology as systems;
PLO6: demonstrate engineer professional skills such as communication and managing projects;
PLO7: demonstrate proficiency in the general education college core requirements: creativity, critical thinking, oral and written communication, information retrieval, quantitative reasoning;
PLO8: demonstrate a recognition of the need for, and an ability to engage in lifelong learning;
PLO9: demonstrate an ability to understand professional, ethical and social responsibilities;
PLO10: demonstrate a respect for diversity and a knowledge of contemporary professional, societal and global issues; and
PLO11: commit to quality, timeliness, and continuous improvement

b) Program Mission
The mission of the ENGT program is to prepare graduates to be productive technologists with a broad array of skills in a variety of areas such as telescope operations, high performance computing for scientific and engineering applications, energy production and distribution including photovoltaic and wind turbines, and system administration in a variety of industries.

c) Date Program Website Last Reviewed/Updated.
January 2018

d) Date Program Page Reviewed/Updated in Catalog.
October 2019

2. Analysis of the Program

a) Strengths and weaknesses in terms of demand, efficiency, and effectiveness based on an analysis of the Quantitative Indicators. CTE programs must include an analysis of Perkins Core indicators for which the program did not meet the performance level. Include Significant Program Actions (new certificates, stop outs, gain/loss of positions, results of prior year's action plan).

Demand Health
The demand health, which states that the program is cautionary, is based on the number of new and replacement positions in the county prorated (#2), and the number of BAS ENGT graduates (#20a). We believe that the demand health does not reflect the reality.

The CIP code chosen for the ENGT program (15.9999) restricts positions to engineering and electro-mechanical technicians. However, ENGT graduates are also hired as software engineers, and project engineers, which refer to different CIP codes. If we were to include all possible positions, the ratio of new and replacement positions in the county prorated to the number of BAS ENGT graduates would be higher.

Efficiency Health
The efficiency health, which states that the program is unhealthy, is based on the fill class rate (#10), and the majors to FTE BOR Appointed Faculty (#12).

The ENGT program is by nature a low-enrolled program. Unless the number of majors increases substantially, this indicator will remain unhealthy or cautionary.

Effectiveness Health
This indicator is healthy.

b) Discuss course offering modality including online, hybrid, and skybridge.
The ECET program does not offer online, hybrid or skybridge ETRO courses. Some General Education courses (ENG, PHIL, HUM, and COM) required for BAS ENGT graduation are offered as hybrid or online classes.

c) Highlight new innovative student support efforts including FYE, etc.
N/A

3. Program Student Learning Outcomes

a) List of the Program Student Learning Outcomes

PLO1: analyze, design, and implement electro-optic systems, control systems, instrumentation systems, communication systems, computer systems, or power systems;
PLO2: apply project management techniques to electrical/electronic(s) and computer systems;
PLO3: utilize integral and differential calculus, or other appropriate mathematics above the level of algebra and trigonometry to solve technical problems;
PLO4: demonstrate critical engineering technology skills and experiences such as: making existing technology operate, creating/selecting new technology, troubleshooting, calibrating, characterizing, and optimizing;
PLO5: demonstrate engineer's way of thinking, analyzing technology as systems;
PLO6: demonstrate engineer professional skills such as communication and managing projects;
PLO7: demonstrate proficiency in the general education college core requirements: creativity, critical thinking, oral and written communication, information retrieval, quantitative reasoning;
PLO8: demonstrate a recognition of the need for, and an ability to engage in lifelong learning;
PLO9: demonstrate an ability to understand professional, ethical and social responsibilities;
PLO10: demonstrate a respect for diversity and a knowledge of contemporary professional, societal and global issues; and
PLO11: commit to quality, timeliness, and continuous improvement

b) Program Student Learning Outcomes that have been assessed in the year of the Annual Review of Program Data.

None

c) Describe the assessment activity

N/A

d) Describe assessment results

N/A

e) Describe any changes that have been made as a result of the assessments.

N/A

4. Action Plan

a) Describe the action plan for the next academic year, including resource, curricular, professional development, or other next steps.

Curricular

We do not plan on changes to the curriculum for the academic year 2019-2020. The last change occurred in Spring 2019 with the offering of a new course: ETRO 470, Introduction to Communication Systems.

ENGT collaboration with ECET

Each year, the American Astronautical Society (AAS) organizes a student design-build-launch competition for space-related topics. This competition is open to teams from universities and colleges, and ENGT seniors have been participating for the last two years. In Fall 2019 and Spring 2020, for the first time, ENGT seniors will engage with ECET sophomore in the Cansat competition. ECET and ENGT majors will regroup into two teams and meet on Fridays, 9:00-11:45 am, year-round, under the supervision of Dr. Park. ENGT majors will lead the teams. Teams must be able to design and build a space-type system, following the approved competition guide, and then compete against each at the end of two semesters to determine the winners. If selected, the teams will travel to Virginia in June for the final phase of the competition. ENGT students will receive credit for ETRO 498, Capstone Project II.

Relocation of equipment

The Laser Milling Machine and Printed Circuit Board machine hosted in the Vocational building will need to be relocated in KAA 202 (closer to the electro-optics lab) and recalibrated. These machines are instrumental to the program: they are used for various courses and projects throughout the year.

Resources

Materials: The ENGT program relies on the Pre-Engineering Education Collaborative Phase 2 (PEEC II) grant, the Hawai`i Space Grant Consortium (HSGC), and the UH Foundation accounts to purchase new and replacement materials, and renew MATLAB software license. Annual budget: $13,500. STEM provides funds for software license renewals (Multisim, Labview, and Solidworks): $4,000 (Note: The overall budget is shared with the ECET program.)

Recruitment

Plan on attending outreach activities to increase awareness and interest in the 2+2 (2-year ECET + 2-year ENGT) BAS ENGT program.

Instructors

Courses as part of the BAS in ENGT will be taught by ETRO faculty (25.67 TE's), ICS faculty (9.17 TE's), PHYS faculty (4.5 TE's), MATH faculty (4 TE's) and General Education faculty (12 TE's). Lecturers are needed to teach 4 ETRO courses (19.17 TE's).

Next Steps

In Spring 2019, a Memorandum of Agreement (MOA) has been signed by UHMC, Hawai`i Community College (HawCC) and the University of Hawai`i at Hilo (UHH). The MOA allows HawCC students that complete the AAS in ET to pursue and graduate with the UHMC BAS in ENGT

while staying on Hawai`i. Funding is needed to implement the MOA. A grant proposal to National Science Foundation will be submitted in Fall 2019. This initiative will help increase the number of ENGT majors.

b) Include how the actions within the plan support the college's mission. In addition to the overall action plan for the program, include specific action plans for any Perkins Core Indicator for which the program did not meet the performance level.

5. Resource Implications

(physical, human, financial)

Materials and software
New and replacement materials: $20,000
Software license renewals (Matlab, Multisim, Labview, and Solidworks): $5,000.
Total: $25,000
(Note: this budget is shared with the ECET program).

Instructors
UHMC BOR appointed faculty is available to teach ETRO, PHYS, MATH, and General Education courses as part of the ENGT program. Due to the wide variety of topics covered by the ENGT program, lecturers with a particular expertise are needed to teach some ETRO courses.

Appendix: ARPD data

College: University of Hawai'i Maui College
Program: Engineering Technology
Status: Report Complete

Program Quantitative Indicators

STEM Major

Overall Program Health: Cautionary

Workforce Alignment: Classification of Instructional Programs (CIP) -to- Standard Occupational Classification (SOC)

Engineering Technology
CIP Code = 15.9999

17-3024 - Electro-Mechanical Technicians
17-3029 - Engineering Technicians, Except Drafters, All Other

Print ARPD

Demand Indicators		2016 - 17	2017 - 18	2018 - 19	Demand Health
1.	New & Replacement Positions (State)	61	61	53	
*2.	New & Replacement Positions (County Prorated)	2	2	2	
3.	Number of Majors	12	13	12	
3a.	Number of Majors Native Hawaiian	3	2	1	
3b.	Fall Full-Time	36%	77%	55%	
3c.	Fall Part-Time	64%	23%	45%	
3d.	Fall Part-Time who are Full-Time in System	9%	0%	0%	**Cautionary** Insufficient Data County Level
3e.	Spring Full-Time	50%	67%	50%	
3f.	Spring Part-Time	50%	33%	50%	
3g.	Spring Part-Time who are Full-Time in System	8%	0%	0%	
4.	SSH Program Majors in Program Classes	141	239	144	
5.	SSH Non-Majors in Program Classes	180	24	94	
6.	SSH in All Program Classes	321	263	238	
7.	FTE Enrollment in Program Classes	11	9	8	
8.	Total Number of Classes Taught	13	14	12	

NOTE: New & Replacement jobs updated (View Methodology).

Efficiency Indicators		2016 - 17	2017 - 18	2018 - 19	Efficiency Health
9.	Average Class Size	8	5	6	Unhealthy
*10.	Fill Rate	58%	40.9%	42%	
11.	FTE BOR Appointed Faculty	2	2	2	
*12.	Majors to FTE BOR Appointed Faculty	6	6	6	
13.	Majors to Analytic FTE Faculty	6	6	6	
13a.	Analytic FTE Faculty	2	2	2	
14.	Overall Program Budget Allocation	$138,343	$194,003	$0	
14a.	General Funded Budget Allocation	$138,343	$191,834	$0	
14b.	Special/Federal Budget Allocation	$0	$0	$0	
14c.	Tuition and Fees	$0	$2,169	$0	
15.	Cost per SSH	$632	$0	$0	
16.	Number of Low-Enrolled (<10) Classes	12	14	10	

Effectiveness Indicators		2016 - 17	2017 - 18	2018 - 19	Effectiveness Health
17.	Successful Completion (Equivalent C or Higher)	73%	86%	90%	Healthy
18.	Withdrawals (Grade = W)	15	7	4	
*19.	Persistence Fall to Spring	73%	92%	91%	
19a.	Persistence Fall to Fall	50%	80%	75%	
*20.	Unduplicated Degrees/Certificates Awarded	1	3	4	
20a.	Degrees Awarded	1	3	4	
20b.	Certificates of Achievement Awarded	0	0	0	
20c.	Advanced Professional Certificates Awarded	0	0	0	
20d.	Other Certificates Awarded	0	0	0	
21.	External Licensing Exams Passed	0	0	0	
22.	Transfers to UH 4-yr	6	6	4	
22a.	Transfers with credential from program	4	5	3	
22b.	Transfers without credential from program	2	1	1	

	Distance Indicators	2016 - 17	2017 - 18	2018 - 19	
23.	Number of Distance Education Classes Taught	1	1	1	
24.	Enrollments Distance Education Classes	60	6	14	
25.	Fill Rate	200%	20%	47%	
26.	Successful Completion (Equivalent C or Higher)	70%	33%	86%	
27.	Withdrawals (Grade = W)	12	4	0	
28.	Persistence (Fall to Spring Not Limited to Distance Education)	90%	100%	0%	

	Perkins Indicators	Goal	Actual	Met	
29.	1P1 Technical Skills Attainment	93	100	Met	
30.	2P1 Completion	55	60	Met	
31.	3P1 Student Retention or Transfer	81.9	100	Met	
32.	4P1 Student Placement	66.25	75	Met	
33.	5P1 Nontraditional Participation	23.5	15.38	Not Met	
34.	5P2 Nontraditional Completion	23	25	Met	

	Performance Indicators	2016 - 17	2017 - 18	2018 - 19	
35.	Number of Degrees and Certificates	1	3	4	
36.	Number of Degrees and Certificates Native Hawaiian	0	1	1	
37.	Number of Degrees and Certificates STEM	1	3	4	
38.	Number of Pell Recipients[1]	0	2	1	
39.	Number of Transfers to UH 4-yr	6	6	4	

*** Used in Rubric to determine Health Indicator**

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Glossary/Rubric