ABET
SELF-STUDY REPORT

for the

Associate of Science
Mechanical Engineering Technology

at

Fairmont State University

Fairmont, West Virginia

Spring 2019

CONFIDENTIAL

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Program Self-Study Report
for
ETAC of ABET
Accreditation or Reaccreditation

BACKGROUND INFORMATION

A. Contact Information

List name, mailing address, telephone number, fax number, and e-mail address for the primary pre-visit contact person for the program.

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B. Program History

Include the year implemented and the date of the last general review. Summarize major program changes with an emphasis on changes occurring since the last general review.

Historical Perspective

A review of university academic catalogs reveals the current Mechanical Engineering Technology, Associate of Science program, evolved into a stand-alone academic program in 1984. Prior to that, the Division of Technology offered a core curriculum with specializations/concentrations in various fields of study. The evolution of this program over the years was in response to perceived needs and trends. A chronology of the changes is in Table 1. The original program (pre-1984), at 67 credit hours, remained unchanged until 1984 when it was changed from an area of concentration to the Mechanical Engineering Technology program. (see Table 2). The next complete program revision occurred in 1988. Courses including MAF 250, SAF 201 and EDP 100 were removed. Also the following courses were added CS 101, DRF 235, and DRF 270. A summary of the complete program modifications can be seen in Table 3. Various changes in general studies requirements, course prefixes, and numbers occurred between 1988 and 2003. In 2003 a complete change in course prefixes and numbers occurred. All courses were changed to a four letter prefix and four digit course numbers (see Table 4).

Historical Review of Program A.S. Mechanical Engineering Technology				
Year	Program Title	Degree	Hours Required	Changes
1984	Mechanical Engineering Technology	AS	67	**New Program**
1986	Mechanical Engineering Technology	AS	67	IND 250 changed to MFG 250
1988	Mechanical Engineering Technology	AS	67	**Complete Program Modification**
1990-1993	Mechanical Engineering Technology	AS	67	**No Change**
1994	Mechanical Engineering Technology	AS	69	Change in Speech Com. Hours
1995-97	Mechanical Engineering Technology	AS	69	No Changes
1998	Mechanical Engineering Technology	AS	69	Change in DRF 270 Computer Graphics to Fundamentals of CAD
1999	Mechanical Engineering Technology	AS	69	**Change in MAT 100 Materials and Processes to MAF 100**
2000	Mechanical Engineering Technology	AS	67	Change in Speech Com. hours
2001-2002	Mechanical Engineering Technology	AS	67	**No Changes**
2003	Mechanical Engineering Technology	AS	67	Course Prefix and Number Changes
2004-2013	Mechanical Engineering Technology	AS	67	No Changes
2013	Mechanical Engineering Technology	AS	60	**Complete Program Modification**

Table 1

Program Changes after Last General Review

ABET's last general review of the Mechanical Engineering Technology program was October, 2013. Since that visit, there has been one program revision resulting in major curriculum modifications. In 2012-2013 the program proposed and received approval to make changes that met mandates of the Higher Education Policy Commission, the university, and recommendations of the Industrial Advisory Committee (*see Table 5*). The proposal was designed to align the Mechanical Engineering Technology program with the current 60 hour degree requirement and newly approved general studies curriculum. Other changes were based on results of the program's Continuous Improvement Plan. The current program curriculum can be seen in Table 6. The only modification from 2013 is the changing of math course numbering.

1984 Program Curriculum			
Program Title:	Mechanical Engineering Technology		
Program Degree:	AS		
Program Changes:	New Program		
Required Credits:	67 semester Hours		
Required Related Courses:			**Credits**
General Requirements			
Math	101	Applied Technical Math I	3
	102	Applied Technical Math II	3
Science	PHYS 101	Physics	4
	PHYS 102	Physics	4
EDP	100	Introduction Electronic Data Processing	3
Technology	IND 250	Personnel Problems and Labor Relations	3
	SAF 201	Occupational Safety	3
	TEC 290	Engineering Analysis I	4
Technology (Mechanical)	ELE 100	Circuit Analysis I	3
	ELE 250	AC-DC Machinery and Controls	3
	MAT 100	Material and Processes	3
	DRF 100	Engineering Graphics	3
	MEC 100	Statics	3
	MEC 200	Strength of Materials	4
	MEC 210	Thermodynamics I	3
	MEC 220	Fluid Mechanics	3
	MEC 240	Machine Design I	3
		Total Course Related Hours	55
Revision Summary:			
Modification of course numbers & inclusion of the following courses:			
Elimination of the following programs:			

Table 2

1988 Program Curriculum			
Program Title:	Mechanical Engineering Technology		
Program Degree:	AS		
Program Changes:	Complete Program Modification		
Required Credits:	67 semester Hours		
Required Related Courses:			**Credits**
General Requirements			
Math	101	Applied Technical Math I	3
	102	Applied Technical Math II	3
Science	PHYS 101	Physics	4
	PHYS 102	Physics	4
Technology	CS 101	Applied Technical Program	3
	ELE 100	Circuit Analysis I	3
	ELE 250	AC-DC Machinery and Controls	3
	MAT 100	Material and Processes	3
	DRF 100	Engineering Graphics	3
	DRF 235	Technical Drafting	3
	DRF 270	Computer Graphics	3
	MEC 100	Statics	3
	MEC 200	Strength of Materials	4
	MEC 210	Thermodynamics I	3
	MEC 220	Fluid Mechanics	3
	MEC 240	Machine Design I	3
	TEC 290	Engineering Analysis I	4
		Total Course Related Hours	55

Revision Summary:
Modification of course numbers & inclusion of the following courses:
CS 101 Applied Technical Program
DRF 235 Technical Drafting
DRF 270 Computer Graphics
Elimination of the following programs:
MAF 250 Personnel Problems and Labor Relations
SAF 201 Occupational Safety
EDP 100 Introduction Electronic Data Processing

Table 3

2003 Program Curriculum			
Program Title:	Mechanical Engineering Technology		
Program Degree:	AS		
Program Changes:	Course Prefix and Number Changes		
Required Credits:	67 semester Hours		
Required Related Courses:			**Credits**
General Requirements			
Math	MATH 1101	Applied Technical Math I	3
	MATH 1102	Applied Technical Math II	3
Science	PHYS 1101	Physics	4
	PHYS 1102	Physics	4
Technology	COMP 1101	Applied Technical Program	3
	ELEC 1100	Circuit Analysis I	3
	ELEC 2250	AC-DC Machinery and Controls	3
	MANF 1100	Material and Processes	3
	DRF 1100	Engineering Graphics	3
	DRF 2235	Technical Drafting	3
	DRF 2200	Computer Graphics	3
	MEC 1100	Statics	3
	MEC 2200	Strength of Materials	4
	MEC 2210	Thermodynamics I	3
	MEC 2220	Fluid Mechanics	3
	MEC 2240	Machine Design I	3
	TEC 2290	Engineering Analysis I	4
		Total Course Related Hours	55
Revision Summary:			
Modification of course numbers & inclusion of the following courses:			
Elimination of the following programs:			

Table 4

2013 Program Curriculum			
Program Title:	Mechanical Engineering Technology		
Program Degree:	AS		
Program Changes:	Complete Program Revision		
Required Credits:	**6**0 semester Hours		
Required Related Courses:			Credits
General Requirements			
Math	1101, 1102	Applied Technical Math I & II	6
Science	PHYS 1101, 1102	Introduction to Physics I & 2	8
Technology	TECH 1108	Engineering Graphics I	3
	TECH 2208	Engineering Graphics II	3
	TECH 2290	Engineering Analysis I	4
	ELEC 1100	Circuit Analysis I	3
	ELEC 2250	AC-DC Machinery and Controls	3
	MANF 1100	Material and Processes	3
	MECH 1100	Statics	3
	MECH 2200	Strength of Materials	4
	MECH 2210	Thermodynamics I	3
	MECH 2220	Fluid Mechanics	3
	MECH 2240	Machine Design	3
		Total Course Related Hours	49
Revision Summary			
Renaming and adding the following courses:			
TECH 1108: Engineering Graphics I			
TECH 2208: Engineering Graphics II			
Elimination of the following courses:			
DRFT 1100: Engineering Graphics			
DRAF 2200: Fundamentals of CAD			
DRFT 2235: Technical Drafting			
COMP 1101: Applied Technical Program			

Table 5

Current Program Curriculum			
Program Title:	Mechanical Engineering Technology		
Program Degree:	AS		
Program Changes:	Complete Program Revision		
Required Credits:	**6**0 semester Hours		
Required Related Courses:			Credits
General Requirements			
Math	1510, 1520	Applied Technical Math I & II	6
Science	PHYS 1101, 1102	Introduction to Physics I & 2	8
Technology	TECH 1108	Engineering Graphics I	3
	TECH 2208	Engineering Graphics II	3
	TECH 2290	Engineering Analysis I	4
	ELEC 1100	Circuit Analysis I	3
	ELEC 2250	AC-DC Machinery and Controls	3
	MANF 1100	Material and Processes	3
	MECH 1100	Statics	3
	MECH 2200	Strength of Materials	4
	MECH 2210	Thermodynamics I	3
	MECH 2220	Fluid Mechanics	3
	MECH 2240	Machine Design	3
		Total Course Related Hours	49
Revision Summary			
Renaming and adding the following courses:			
MATH 1101 to MATH 1510			
MATH 1102 to MATH 1520			
Elimination of the following courses:			

Table 6

C. Options

List and describe any options, tracks, concentrations, etc. included in the program.

The Associates of Science in Mechanical Engineering Technology does not have any options, tracks or concentrations. Students who come into the program with prior college credits are advised regarding minors, certificates or duel major depending on the academic interests.

D. Program Delivery Modes

Describe the delivery modes used by this program, e.g., days, evenings, weekends, cooperative education, traditional lecture/laboratory, off-campus, distance education, web-based, etc.

The Mechanical Engineering Technology program is delivered primarily through day, afternoon, and evening course offerings on the main campus at 1201 Locust Avenue, Fairmont, WV.

The program's course material is delivered via lecture, laboratory, experiential, and Blackboard methodologies. Even though course material development and delivery is at the discretion of the professor, all faculty must post course information (syllabi) and grades to Blackboard.

E. Program Locations

Include all locations where the program or a portion of the program is regularly offered (this would also include dual degrees, international partnerships, etc.).

The Mechanical Engineering Technology program is located on the main campus of Fairmont State University. Most of the program courses are offered in the Engineering Technology building.

F. Public Disclosure

Provide information concerning all the places where the Program Education Objectives (PEOs), Student Outcomes (SOs), annual student enrollment and graduation data are made accessible to the public. This information should be easily found on either the program or institutional website so please provide the URLs.

All program information can be found at the following program website:

https://www.fairmontstate.edu/collegeofscitech/academics/mechanical-engineering-technology

G. Deficiencies, Weaknesses or Concerns from Previous Evaluation(s) and the Actions Taken to Address Them

Summarize the Deficiencies, Weaknesses, or Concerns remaining from the most recent ABET Final Statement. Describe the actions taken to address them, including effective dates of actions, if applicable. If this is an initial accreditation, state it is an initial accreditation.

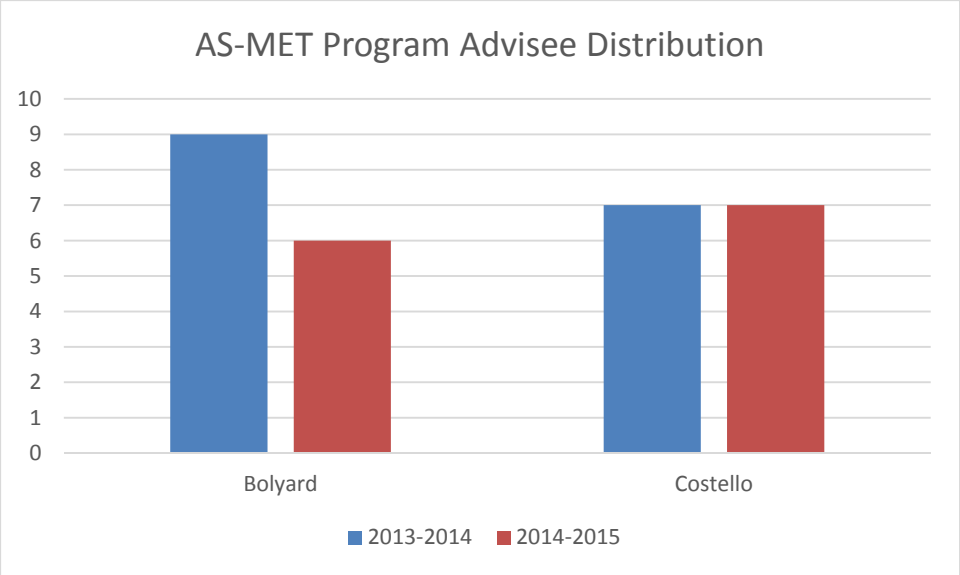
Findings in meeting provisions of the ABET criteria or policies are described below.

1. Previous Finding and Criteria: Criterion 6, Faculty, states that, "The faculty serving the program must be of sufficient number to maintain continuity, stability, oversight, student interaction, and advising." The number of full-time faculty members is currently sufficient to maintain the teaching and related curriculum and program responsibilities required but the student advising load is exceptionally large.
While the criterion is currently satisfied, the potential exists for this situation to change. An increase in enrollment would increase the advising load of the program faculty members to unreasonable levels. Any increase in the number of students would have a detrimental effect on the quality of advising and the quality of instruction. This finding remains a Concern until the program maintain sufficient faculty to meet program needs.

Due Process Response: A memorandum from the Provost was provided stating that if enrollment continued to increase there would be a possibility of increased faculty allocation.

Status after Due Process: The Concern remains until the program demonstrates that it has sufficient faculty members to meet the program needs.

RESPONSE: The Department of Technology will conduct group advising beginning with registration for the Spring 2015 semester. The group effort will reduce the number of advisee's seen on an individual basis by solving the needs of most students in the group allowing the faculty to spend more time with advisee's needing special considerations. The allocation of AS-Degree advisee's for the Mechanical Engineering Technology faculty are shown in the table below:



2. Criteria: Criterion 7, Facilities states, “Classrooms, offices, laboratories, and associated equipment must be adequate to support attainment of the student outcomes and to provide an atmosphere conducive to learning.” There is currently an effort to distribute space between Fairmont State University and Pierpont Community College. The final allocation of space could be a rigid proportional distribution that does not take into consideration the needs of the programs at both institutions. The allocation of space should support attainment of student outcomes and provide an atmosphere conducive to learning. This finding remains a Concern until the program provides adequate classrooms, offices and laboratories to support attainment of the student outcomes.

Due Process Response: A memorandum from the Provost was provided stating that the University expects to reallocate space to the College of Science and Technology upon completion of the Advanced Technology Center in 2015.

Status after Due Process: The Concern remains until adequate space has been allocated to the program to support the attainment of the student outcomes.

RESPONSE: Fairmont State University currently shares space with Pierpont Community and Technical College. Upon completion of Pierpont Community and Technical College new off-site Advanced Technology Center, additional space will become available for the Engineering Technology programs.

GENERAL CRITERIA

CRITERION 1. STUDENTS

For the sections below, attach in supplemental information any written policies that apply or provide a link to an appropriate page on the institution's website.

A. Student Admissions

Summarize the requirements and process for accepting new students into the program.

Admission Requirements

Students seeking admission to Fairmont State University must be of the age of compulsory attendance in the state of West Virginia and file an application for admission. Application and supporting credentials must be on file at least two weeks prior to the opening of a semester or term. All credentials submitted in support of an application for admission become the property of the University and will not be returned to the student. Any student admitted upon the basis of false credentials will be subject to immediate dismissal from the University.

The application for admission must specify the student's desired degree or program objective. Admission to Fairmont State University does not guarantee admission to specific programs, which may be restricted due to limitations of staff, physical facilities, and space available for experiential training. The standards and procedures for admission to limited-enrollment programs are presented later in this section.

Students who fail to register during the semester or term for which they have been admitted, must file another application in order to gain admission at a later date.

Fairmont State University Admission Requirements

REQUIRED FORMS AND CREDENTIALS

All students applying for admission to Fairmont State University degree programs are required to complete and submit the following forms and credentials:

1) Application for Admission
2) Official high school transcript sent by high school or high school equivalency diploma (not required for transfer students having a 2.0 grade point average and at least 24 hours of completed coursework)
3) Official ACT or SAT scores (not required for students who graduated high school more than 5 years prior to enrollment term or for transfer students having a 2.0 average and at least 24 hours of completed coursework)

4) Transcript of home-schooled students to include classes taken, credit hours and grades earned, graduation date and signature of the home school provider (may be submitted in lieu of a high school equivalency transcript, however the high school equivalency transcript may be required for financial aid and scholarships)
5) Official college transcripts, if applicable
6) Immunization Records including measles, mumps, & rubella (MMR) (if born after January 1, 1957)
7) Permanent Resident Card, if applicable

ADMISSION REQUIREMENTS

Admission to degree programs is open to graduates of approved high schools who have a 2.0 high school GPA (or received a high school equivalency transcript) and a minimum composite score of 18 on the ACT or 870 on the SAT (combination of Critical Reading and Math scores if test was taken prior to March 2016) or a 950 SAT (total score on tests taken March 2016 and after). Students with at least a 3.0 high school GPA and SAT or ACT composite test scores will be admitted regardless of the test scores. Applicants must also satisfy the following minimum high school unit requirements.

REQUIRED UNITS (Years)

- 4 English (including English 12CR and courses in grammar, composition, and literature)
- 3 Social Studies (including U.S. studies/history)
- 4 Mathematics (three units must be Algebra I and higher or Math I or higher; Transitional Math for Seniors will also be accepted). Courses designed as "support courses", such as Math I Lab or Math I Support, that provide extra instructional time but no additional content shall not be acceptable as meeting the required 4 mathematic course core requirements.
- 3 Science (all courses to be college preparatory laboratory science, preferably including units from biology, chemistry, and physics)
- 1 Arts
- 2 World Language (two units of the same world language; sign language is also acceptable)

Fairmont State University may admit by exception students who do not meet the basic admissions standards.

B. Evaluating Student Performance

Summarize the process by which overall student academic performance is evaluated and student progress towards graduation is monitored. Include information on how the program ensures and documents that students are meeting course prerequisites and how the situation is addressed when a prerequisite has not been met.

ASSESSMENT OF STUDENT ACADEMIC ACHIEVEMENT

Fairmont State University employs a variety of assessment processes to inform students of progress in courses and clinical experience and toward degrees, to analyze programs in order to make appropriate curricular changes, and to determine institutional effectiveness. The university follows policies of the Higher Learning Commission of the North Central Association of Colleges and Schools, the WV Higher Education Policy Commission, policies of specific academic and professional accrediting bodies, and its own governing board.

In addition to regular course examinations and presentations, assessments used include field tests of proficiency in the major; electronic portfolios; capstone projects; internships; clinical practice reviews; and juried performances. Some programs, such as nursing and teacher education, also require nationally normed entrance and exit examinations. All degree programs analyze and review their effectiveness every five years, reporting this information to the WVHEPC and the Fairmont State University Board of Governors. Programs also engage in an annual review process to assess the effectiveness of academic programs and learning experiences. The institution reports its overall progress to the HLC every ten years.

GRADING SYSTEM

The following system of grading is used at FAIRMONT STATE UNIVERSITY:

A - Superior. Given only to students for exceptional performance
B - Good. Given for performance distinctly above average in quality
C - Average. Given for performance of average quality
D - Lowest passing grade, for performance of poor quality
F - Failure. Course must be repeated if credit is to be received
I - Incomplete, a temporary grade given only when students have completed more than 70% of the course but are unable to conclude it because of unavoidable circumstance.
W - W - Withdrew
CR - Credit/grade of "C" or higher. Does not affect quality points (see below)
NC - No Credit. Does not affect quality points
NCX - No Credit, indicating a significant lack of effort. Does not affect quality points.
NR - Not Reported. Given when instructor has not submitted grade
S - Satisfactory. Given for Continuing Education courses only
U - Unsatisfactory. Given for Continuing Education courses only

QUALITY POINTS

The value of a student's work is indicated by quality points. Candidates for graduation must have at least twice as many quality points as GPA hours; that is, a point-average of 2.0 on all college work.

Quality points for grades A, B, C, D, are computed as follows:

A - Four (4) quality points for each semester hour of credit
B - Three (3) quality points for each semester hour of credit
C - Two (2) quality points for each semester hour of credit
D - One (1) quality point for each semester hour of credit

Students' grade averages are determined by dividing the number of quality points by the number of GPA hours. No quality points are attached to grades of F, but the GPA hours for the courses in which these grades are received will be used in computing grade averages. In order to graduate, candidates for degrees must maintain a grade point average of 2.0 or better in all college courses and in all credit earned at Fairmont State University. An average of 2.0 must also be maintained in the major and minor fields of study. Students in the teacher education program must attain a grade point average of 2.75 overall, in each teaching field and in professional education. It is the student's responsibility to remain informed of quality point standing. This information can be obtained at any time from the Registrar's Office.

EXAMPLE FOR COMPUTING GRADE-POINT AVERAGE

Courses Taken	Final Grade	Quality Points	Semester Hours	Quality Points (Total)
ENGL 1101	A	4	3	12
BIOL 1101	D	1	4	4
HIST 2211	B	3	3	9
SOCY 1110	C	2	3	6
POLI 1100	B	3	3	9
MATH 1510	W	-	-	-
		13	16	40

40 Quality Points
16 Semester Hours = 2.5 Grade-Point Average

PRE-ENGINEERING CURRICULUM

Students planning graduate-level work in engineering should complete the following course work with a B average or better. Students are advised to carefully consult the catalog of the engineering school which they plan to attend, as Fairmont State University does not have an articulation agreement with any school of engineering.

- CHEM 1105, 2200 CHEMICAL PRINCIPLES, FOUNDATIONAL BIOCHEMISTRY 9
- ENGL 1101, 1102 WRITTEN ENGLISH I, II 6
- MATH 1540 TRIG. AND ELEMENTARY FUNCTIONS 3
- MATH 2501 CALCULUS I 4
- MECH 1100 STATICS 3
- PHED 1100 FITNESS AND WELLNESS 2
- PHYS 1101, 1102 INTRODUCTION TO PHYSICS I, II 8
- -OR PHYS 1105, 1106 PRINCIPLES OF PHYSICS I, II 8
- SOCIAL SCIENCE ELECTIVE 3
- TECH 1108 ENGINEERING GRAPHICS I 3

C. Transfer Students and Transfer Courses

Summarize the requirements and process for accepting transfer students and transfer credit. Include any state-mandated articulation requirements that impact the program.

TRANSFER STUDENTS

Any applicant for admission to Fairmont State University who has attended another collegiate institution will be classified as a transfer student. Every effort will be made to allow credit earned at other accredited colleges and universities to count towards a degree at Fairmont State University. Transfer students must meet the previously stated admission requirements of Fairmont State University. They must provide evidence of good standing at the institution last attended and must have maintained a minimum 2.0 GPA.

Students transferring fewer than 24 semester hours must provide an official copy of their high school transcript/home school or high school equivalency transcript, official ACT or SAT scores (if the student has graduated from high school less than 5 years prior to the enrollment term) and official college transcript(s).

TRANSFERRING CORE COURSEWORK

According to Series 17, Policy Regarding the Transferability of Credits and Grades at the Undergraduate Level, students who transfer from one state college or university to another may transfer core coursework that will count toward fulfillment of general studies requirements at the receiving institutions.

Under the terms of the agreement, a student may transfer up to thirty-five credit hours of undergraduate coursework in the areas of English composition, communications and literature, fine arts appreciation, mathematics, natural science, and social science as general studies credits. Copies of the agreement are available in the Enrollment Services Center.

The following is a list of General Studies Requirements that may be fulfilled by comparable coursework at another institution. All other General Studies Requirements must be completed at Fairmont State University.

English Composition - 6 hours
ENGL 1101 WRITTEN ENGLISH I 3
ENGL 1102 WRITTEN ENGLISH II..... 3

Communication and Literature - 6 hours
COMM 2200 INTRO. TO HUMAN COMMUNICATION 3
ENGL 2220 LITERATURE OF THE WESTERN WORLD I 3
ENGL 2221 LITERATURE OF THE WESTERN WORLD II 3
ENGL 2230 INTRODUCTION TO LITERATURE I 3
ENGL 2231 INTRODUCTION TO LITERATURE II 3
ENGL 3391 THE SHORT STORY 3

Fine Arts Appreciation - 3 hours
ART 1120 ART APPRECIATION 3
INTR 1120 EXPERIENCING THE ARTS 3
MUSI 1120 MUSIC APPRECIATION 3
THEA 1120 THEATRE APPRECIATION 3

Mathematics - 3-4 hours
MATH 1507 or 1407 FUNDAMENTAL CONCEPTS OF MATHEMATICS ….. 3-4
MATH 1530 or 1430 COLLEGE ALGEBRA 3-4
MATH 1540 TRIGONOMETRY AND ELEMENTARY FUNCTIONS 4
MATH 2501 CALCULUS I 4

Natural Science - 8-10 hours
BIOL 1105 BIOLOGICAL PRINCIPLES I 4
BIOL 1106 BIOLOGICAL PRINCIPLES II..... 4
CHEM 1101 GENERAL CHEMISTRY 4
CHEM 1102 GENERAL CHEMISTRY II 4
CHEM 1105 CHEMICAL PRINCIPLES I..... 5
PHYS 1101 INTRODUCTION TO PHYSICS I 4
PHYS 1102 INTRODUCTION TO PHYSICS II 4
PHYS 1105 PRINCIPLES OF PHYSICS I 4
PHYS 1106 PRINCIPLES OF PHYSICS II 4
GEOL 1101 GENERAL GEOLOGY 4
GEOL 1102 HISTORICAL GEOLOGY 4

Social Science - 9 hours
BSBA 2200 ECONOMICS 3
BSBA 2211 PRINCIPLES OF MACROECONOMICS 3
HIST 1107 U.S. HISTORY I 3
HIST 1108 U.S. HISTORY II 3
HIST 2211 HISTORY OF CIVILIZATION I..... 3
HIST 2212 HISTORY OF CIVILIZATION II 3
HIST 2213 HISTORY OF CIVILIZATION III 3
POLI 1103 AMERICAN GOVERNMENT 3
POLI 2200 INTRODUCTION TO POLITICAL SCIENCE 3
PSYC 1101 INTRODUCTION TO PSYCHOLOGY 3
SOCY 1110 INTRODUCTION TO SOCIOLOGY 3

CREDIT FROM A JUNIOR OR COMMUNITY COLLEGE

The maximum credit accepted from a Junior or Community College accredited by the North Central Association of Colleges and Schools or other regional accrediting association will not exceed 72 semester hours.

D. Advising and Career Guidance

Summarize the process for advising and providing career guidance to students. Include information on how often students are advised, who provides the advising (program faculty, departmental, college or university advisor).

ACADEMIC ADVISING SYSTEM

Students are assigned academic advisors when they first enroll at Fairmont State University. The advisor is a faculty member in the respective major. Those students who are not ready to select a major upon entrance will be assigned to the Office of Exploratory Advising. Students wanting to change their major fields of study must contact the Registrar's Office; students will then be referred to their major departments to have a new advisor assigned.

Students should discuss problems relating to degree requirements, registration, and withdrawals from class or college with their advisors. Students are assigned a PIN number for registration each semester and must meet with their assigned advisor to discuss academic progress and scheduling. Once a schedule is established, students obtain their PIN numbers and may register for courses.

Faculty advising consists of academic and career planning. Students meet with their faculty advisors every semester until graduation. During the advising sessions, students are advised regarding course schedules, internships and career goals. Advisors will encourage elective and special topic courses that may enhance an individual students' goals.

All students in the Mechanical Engineering Technology program have internship opportunities beginning in the freshmen/sophomore summer. Students are advised to choose opportunities that interest them and vary their experiences each summer with a different company or type of work environment. Beginning in the senior year, students are encouraged to apply for graduation and begin their career search. Outside of advising, students in the MET program are presented with many employment opportunities- local, regional and national. In the academic year 2018-2019, a variety of employers came to campus and gave students a chance to apply and interview. Students benefit from the opportunity to interview and potentially gain employment.

E. Work in Lieu of Courses

Summarize the requirements and process for awarding credit for work in lieu of courses. This could include such things as life experience, Advanced Placement, dual enrollment, test out, military experience, etc.

ADVANCED PLACEMENT EXAMINATION (AP)

Fairmont State University recognizes certain examinations of the College Board Advanced Placement Program. Students who participate in the AP program and wish to have their scores evaluated for credit should have their scores sent to Fairmont State University. The AP examinations are prepared by the College Board, and the papers are graded by readers of the Educational Testing Service, Princeton, NJ 08540. Students cannot receive credit for a score below 3 on any exam.

Students who do receive credit will be assigned the grade of CR, which is not calculated into the GPA. Students will not be awarded multiple credit, standing or GPA based on duplicated advanced placement scores, tests or transfer work.

COLLEGE LEVEL EXAMINATION PROGRAM (CLEP)

The College Level Examination Program (CLEP) provides students with the opportunity to demonstrate college-level achievement through a program of exams in undergraduate college courses. Students can reduce their costs in time and money by successfully completing CLEP tests for credit. The CLEP exams are prepared by the College Board and administered by Pierpont Community & Technical College. Students must achieve a minimum score of 50 to receive college credit. For additional information, contact the Center for Workforce Education at (304) 368-7254 or (304) 367-4920.

Students will not be awarded multiple credit, standing or GPA based on duplicated advanced placement scores, tests or transfer work.

EQUIVALENT CREDIT

A unique feature of the RBA Degree Program is the possibility of obtaining college-equivalent credit for demonstrated college-level knowledge that has been learned in environments and agencies outside the classroom. To earn credit, students must demonstrate knowledge of learning objectives and outcomes equivalent to specific courses taught at Fairmont State or within the West Virginia State System of Higher Education. Students who have obtained any professional, state, or national licenses or certifications can request a review of the credentials to determine if they are eligible to receive college credit.

Portfolio evaluations are completed for enrolled students by faculty members who teach the course for which credit is sought. Portfolios should be submitted prior to semester midterm to ensure that sufficient time is available for evaluation. The fee for portfolio evaluation is $300 regardless of whether or not credit is awarded. If credit is recommended, then the faculty members will also recommend the number of credit hours to be awarded along with the appropriate level (upper or lower). An additional $10 per credit hour processing fee is required to transcript the credit.

Credit earned via portfolio or prior learning assessment does not count toward meeting the state or institutional residency requirements for the RBA program. Awarded credit hours will not be posted to a student's academic transcript until after residency requirements have been met.

Academic credit will only be awarded to students who are admitted to and currently enrolled in the RBA Degree Program. Students, however, cannot be awarded college - Equivalent credit during their first or final semesters in the RBA program.

F. Graduation Requirements

Summarize the graduation requirements for the program and the process for ensuring and documenting that each graduate completes all graduation requirements for the program. State the name of the degree awarded (e.g., Bachelor of Science in Electrical Engineering Technology, Associate of Science in Engineering Technology, Associate of Applied Science in Mechanical Engineering Technology.)

DEGREE REQUIREMENTS

To qualify for an Associate Degree, candidates must accumulate a total of 60 credit hours with a minimum quality point average of 2.00.

To qualify for graduation, candidates must accumulate a total of 60 semester hours of credit with a minimum quality point average of 2.00. Students must complete 15 semester hours of General Studies courses. At least 12 semester hours must be taken in the West Virginia State

System of Higher Education and at least 6 of those credit hours must be completed at Fairmont State.

Students are required to apply for graduation. This process takes place the semester before the anticipated graduation. The students are audited for degree compliance and receive a graduation audit form outlining any remaining degree requirements. The degree audit ensure the student is aware of any remaining requirements and can register for the appropriate courses.

G. Transcripts of Recent Graduates

The program must provide transcripts from recent graduates to the visiting team along with any needed explanation of how the transcripts are to be interpreted. **These transcripts will be requested separately by the Team Chair.** State how the program and any program options are designated on the transcript. (See 2019-2020 APPM, Section I.E.3.a.)

The degree is designated as a Associate of Science in Engineering Technology. No options currently exist in the program. Minors, concentrations, and or specializations may be obtained, but are not options in the program. Examples may be a minor in occupational safety or business.

CRITERION 2. PROGRAM EDUCATIONAL OBJECTIVES

A. Mission Statement

Provide the institutional mission statement.

MISSION STATEMENT

The Fairmont State University family educates, enriches, and engages students to achieve personal and professional success.

VISION STATEMENT

Fairmont State University aspires to be nationally recognized as a model for accessible learner centered institutions that promote student success by providing comprehensive education and excellent teaching, flexible learning environments, and superior services. Graduates will have the knowledge, skills, and habits of mind necessary for intellectual growth, full and participatory citizenship, employability, and entrepreneurship in a changing environment.

B. Program Educational Objectives

List the program educational objectives and state where these can be found by the general public. *This is typically an easy to find web page clearly linked to the program's website.*

The Program Educational Objectives have changed during this accreditation cycle. The following were the PEO's until November of 2018:

Program Objectives

The Program Objectives, as determined by the Mechanical Engineering Technology Program's constituencies, are intended to promote professional competencies and continued professional growth. Students and graduates shall, to varying degrees, be competent in:

1. applying academic competencies and methodologies in addressing and solving problems as a professional.
2. using learned technical and non-technical methodologies to communicate to audiences of varying demographics.
3. ethically and respectfully performing professional responsibilities as part of a team and or multidisciplinary team.
4. recognizing and assessing the societal and global impact of professional decisions and practices.
5. pursuing lifelong learning through professional development.

During the Fall 2018 semester the PEO's were changed to match industry need and also the newly adopted ABET 1-5 Student Outcomes. The current Program Educational Objectives for the Mechanical Engineering Technology Program are as follows:

1) Relate the concepts of self-directed lifelong learning and the ability to undertake further study and/or examinations specific to the discipline through demonstration of technical skills as a practicing professional, applying knowledge and discipline specific tools.
2) Evaluate results and develop professional documents relevant to the discipline and to communicate such findings to a technical and non-technical audience.
3) Operate effectively in a diverse, multi-disciplinary environment demonstrating skills in leadership, professionalism and teamwork.

https://www.fairmontstate.edu/collegeofscitech/academics/mechanical-engineering-technology-outcomes

C. Consistency of the Program Educational Objectives with the Mission of the Institution

Describe how the program educational objectives are consistent with the mission of the institution. *A table illustrating how educational objectives support the elements of the institutional mission can be used, in addition to a brief explanation.*

The university's mission and the Mechanical Engineering Technology Program Educational Objectives promote the growth and realization of professional and personal development along with the desire for responsible citizenship of graduates. The mission emphasizes providing opportunities for students to achieve their professional and personal goals. The PEO's align with these goals. Through achieving academic competencies, enhancing communication abilities, a desire to pursue life-long learning opportunities and obtaining skills in working in teams, students are afforded the opportunity to attain a level of professional and personal growth that will increase their marketability and societal awareness thereby enriching their degreed field.

Students' personal goals of achieving a college degree that leads to employment in their degreed field supports the university's mission of providing opportunities for personal growth. Since academic competencies can be both intrinsically and extrinsically rewarding, all PEO's can map to personal goals as well.

Lastly, the Mechanical Engineering Technology program promotes the exploration of the impact of professional decisions and inherent responsibilities of professionals through promoting ethical practices. This speaks directly to the university's mission of responsible citizenship. The program also promotes students to earn Professional Development Credits in an effort to teach the importance of professional development as well as community outreach.

In summary, Table 2-1 maps the Program Objectives to the university's mission. The mapping is subject to change depending on the students' personal and professional goals.

Program Objectives *"broad statements that describe the career and professional accomplishments that the program is preparing graduates to achieve at the time of graduation and during the first few years following graduation." Graduates and students shall be competent in*	The Fairmont State University family educates, enriches, and engages students to achieve personal and professional success.		
	Professional goals	***Personal goals***	***Responsible citizenship***
1. Relate the concepts of self-directed lifelong learning and the ability to undertake further study and/or examinations specific to the discipline through demonstration of technical skills as a practicing professional, applying knowledge and discipline specific tools.	X	X	X
2. Evaluate results and develop professional documents relevant to the discipline and to communicate such findings to a technical and non-technical audience.	X	X	X
3. Operate effectively in a diverse, multi-disciplinary environment demonstrating skills in leadership, professionalism and teamwork.	X	X	X

Table 2-1

D. Program Constituencies

List the key program constituencies involved in the review of the program educational objectives. Describe how the program educational objectives meet the needs of these constituencies.

Faculty: Faculty are responsible for successfully teaching the material in the courses, developing the curriculum, student advising and institutional committees. The curriculum is designed to meet the student outcomes and Program Educational Objectives (PEO's). Full time faculty are an integral part of the PEO review process. Part time faculty provide input during meetings or through evaluations.

Alumni: As former students, the success of alumni reflects the achievement of the PEO's. Alumni are asked to provide input on the relevance and achievement of PEO's. Alumni are part of our annual meetings and provide feedback during those events.

Employers: Employers may be academic, industry, government or private entities. Employers provide feedback on recent graduates and achievement of PEO's. Their feedback is typically given at annual meetings and career fairs.

Engineering Advisory Board: This group meets annually at minimum. They are comprised of all constituents plus project managers and team leaders from regional and national employers. They share current practice and experience and help shape the PEO's.

Each of the constituents are a part of the educational process in the Mechanical Engineering Technology program. The faculty have the responsibility for curriculum and education of the students. The program curriculum and program are the main component of

accomplishing the PEO's. The alumni are the results of the program and represent accomplishment of the PEO's. They also have advisory roles in both curriculum and program needs. The employers seek well prepared graduates who can accomplish the PEO's. Employers advise the program to ensure success. The advisory board is comprised of all the constituents and other industry leaders who periodically review the PEO's and modify them to meet the needs of all constituents.

E. Process for Review of the Program Educational Objectives

Describe the process that periodically reviews the program educational objectives including how the program's key constituencies are involved in this process. Describe how this process is systematically utilized to ensure that the program's educational objectives remain consistent with the institutional mission, the program constituents' needs and these criteria.

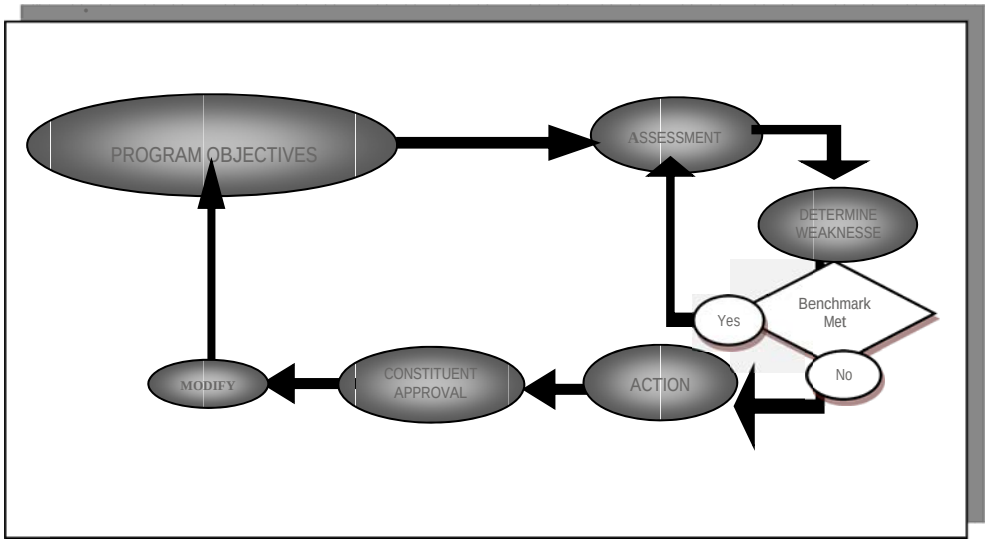
Review of Program Educational Objectives:

Program Educational Objectives are reviewed annually at the Industrial Advisory Committee meeting. The PEO's are displayed annually and reviewed by all constituents. The PEO's were to be updated in the Fall of 2017, however, the impending change to ABET Outcomes caused a delay in the implementation of the new PEO's as faculty wanted to ensure alignment between PEO's and SO's.

The meeting minutes capture any discussion of PEO's. The minutes are reviewed by faculty and program coordinators. The overall continuous improvement (CI) forms document the changes to PEO's. Display materials documenting PEO revision will include:

1) Industrial Advisory Committee (IAC) meeting minutes
2) Continuous Improvement plan form

Program Educational Objectives were approved for change in November of 2018. The PEO's will be reviewed at the next annual IAC meeting. Below is a description of the overall continuous improvement process with relation to PEO's:



CRITERION 3. STUDENT OUTCOMES

A. Process for the Establishment and Revision of the Student Outcomes

Describe the process used for establishing, reviewing, and revising student outcomes.

The Mechanical Engineering Technology program has adopted ABET outcomes 1-5. The adoption of those outcomes is documented in the Industrial Advisory Committee meeting minutes. The new outcomes were discussed and approved November 2018. The review and revision of outcomes will occur when program educational objectives are reviewed annually. PEO's and SO's are reviewed as part of the annual Industrial Advisory Committee meetings. Prior to November 2018, the program had six outcomes linked to ABET student outcomes. A mapping of the former outcomes will be provided in the following sections.

B. Student Outcomes

List the student outcomes for the program. Indicate where the student outcomes are documented and made accessible to the public. *This is typically an easy to find web page clearly linked to the program's website but could also be in a student handbook.*

The Mechanical Engineering Technology program adopted ABET outcomes 1-5 as program outcomes. The student outcomes were changed by the program in November 2018. Prior to November 2018 the student outcomes were ABET "a-k" plus the discipline specific outcomes for the program. The student outcomes can be found on the programs web page:

https://www.fairmontstate.edu/collegeofscitech/academics/mechanical-engineering-technology-outcomes

The Student Outcomes prior to November 2018 were as follows:

1. Students will master and apply current knowledge, techniques, skills, and modern tools of their disciplines including mathematics and science.
2. Students will identify, analyze, and improve technical processes including experimental verification.
3. Students will apply creativity in the design of systems, components, or processes appropriate to program objectives including working on teams and communicating effectively.
4. Students will prepare for the ability to engage in lifelong learning, a commitment to quality, timeliness, and continuous improvement.
5. Students will demonstrate an awareness of professional, ethical, and social responsibilities, including a respect for diversity and a knowledge of contemporary professional, societal and global issues.
6. Students will solve complex problems utilizing discipline specific expertise.

Program Outcomes as Relating to ABET a-k and Program Specific Criteria
The Mechanical ET program has recoded the program specific outcomes mandated by ABET. The coding used by the program is shown below.

ABET Code	Outcome	Mech ET Code
a	an ability to apply the knowledge, techniques, skills, and modern tools of the discipline to narrowly defined engineering technology activities	a
b	an ability to apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require limited application of principles but extensive practical knowledge	b
c	an ability to conduct standard tests and measurements, and to conduct, analyze, and interpret experiments	c
d	an ability to function effectively as a member of a technical team	d
e	an ability to identify, analyze, and solve narrowly defined engineering technology problems	e
f	an ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature	f
g	an understanding of the need for and an ability to engage in self-directed continuing professional development	g
h	an understanding of and a commitment to address professional and ethical responsibilities, including a respect for diversity	h
i	a commitment to quality, timeliness, and continuous improvement	i
a.	Application of principles of geometric dimensioning and tolerancing	j
b.	Use of computer aided drafting and design software	k
c.	Selection, set-up, and calibration of measurement tools/instrumentation	l
d.	Preparation of laboratory reports and systems documentation associated with development, installation, or maintenance of mechanical components and systems	m
e.	Basic familiarity and use of industry codes, specifications, and standards	o
f.	Use of basic engineering mechanics	p
g.	An integrating or capstone experience utilizing skills acquired in the program	q

Table *3-1* maps ABET's a-k and the program criteria as required in criterion 3 to the Mechanical Engineering Technology program's Student Outcomes.

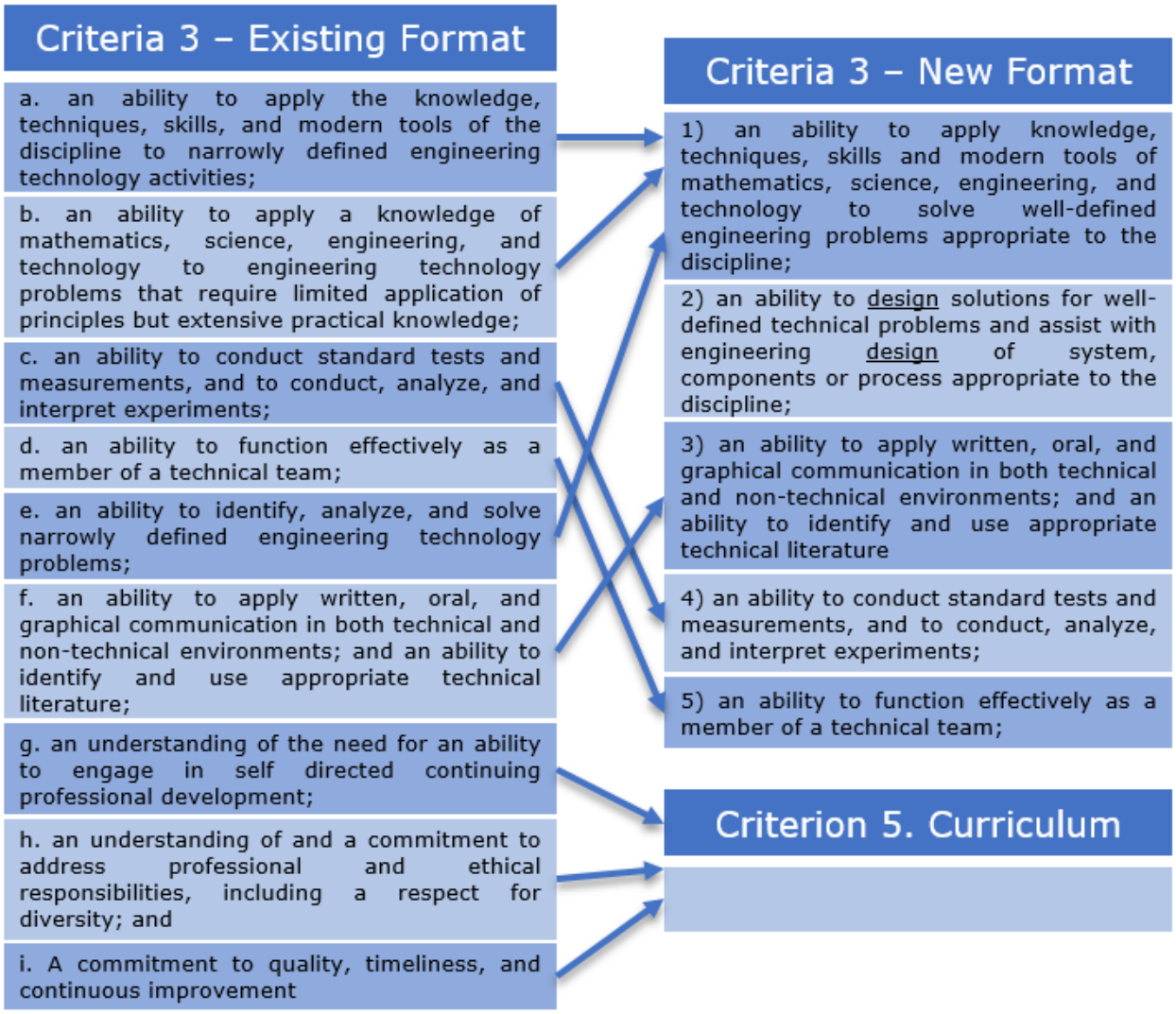
Program Student Outcomes	General Criteria									Program Specific Criteria
	a	b	c	d	e	f	g	h	i	j-q
1. Students will master and apply current knowledge, techniques, skills, and modern tools of their disciplines including mathematics and science.	X	X								
2. Students will identify, analyze, and improve technical processes including experimental verification.			X		X					
3. Students will apply creativity in the design of systems, components, or processes appropriate to program objectives including working on teams and communicating effectively.				X		X				
4. Students will prepare for the ability to engage in lifelong learning, a commitment to quality, timeliness, and continuous improvement.							X		X	
5. Students will demonstrate an awareness of professional, ethical, and social responsibilities, including a respect for diversity and a knowledge of contemporary professional, societal and global issues.								X		
6. Students will solve complex problems utilizing discipline specific expertise.										X

Table 3-1

C. Mapping of Student Outcomes to Criterion 3 Student Outcomes

Describe if the student outcomes used by the program are stated differently than the requirements listed in Criterion 3. If so, provide the mapping of the program's student outcomes to the Criterion 3 requirements one through five.

The Mechanical Engineering Technology program adopted ABET outcomes 1-5 as the program student outcomes. These are newly defined and implemented. The following table shows the mapping from the "a-i" outcomes to the new 1-5 outcomes.



D. Relationship of Student Outcomes to Program Educational Objectives

Describe how the program's student outcomes prepare graduates to attain the program's educational objectives.

It is helpful if the self-study questionnaire provides a mapping, using the table below, of the Program Educational Objectives, Student Outcomes, the ABET (1) – (5) student outcomes and the program courses that support the program student outcomes (courses where the students learn or develop competencies related to the student outcomes).

Program Educational Objective	*ABET (1)-(5)*	*Program Courses Supporting the Program Outcome*
PEO 1	Outcome 1	1100, 2200, 2210, 2220, 2240
	Outcome 2	1100, 2200, 2210, 2220, 2240
PEO 2	Outcome 3	2200, 2220, 2240
	Outcome 4	2200, 2220
PEO 3	Outcome 5	2220, 2240

CRITERION 4. CONTINUOUS IMPROVEMENT

This section of your Self-Study Report should summarize your processes for regularly assessing and evaluating the extent to which the student outcomes are being attained and for using those results for continuous improvement of the program.

Assessment is defined as one or more processes that identify, collect, and prepare the data necessary for evaluation. Evaluation is defined as one or more processes for interpreting the data acquired though the assessment processes in order to determine how well the student outcomes are being attained.

Although the program can report its processes as it chooses, the following is presented as a guide to help you organize your Self-Study Report and present your documentation.

A. Documentation of Processes or Plan

Provide a reference to the plan (documentation of processes in the appendices or in electronic form) used to assess student outcome attainment for the purpose of continuous program improvement. In the sections below, briefly summarize key elements of that process (tabular presentation, where appropriate, is encouraged).

Provide the written plan/graphical representation of the assessment plan clearly identifying who will do what when. If different student outcomes will be assessed in different years, provide an overview of this via a simple table (student outcome versus year of assessment).

ETAC recommends the use of a table (one table per outcome) that captures much of what is requested below (see sample table below). Once data and the other boxes are completed, the table will grow to be several pages.

Overview

The Department of Technology has developed and implemented a Continuous Improvement Plan (CIP) for all ABET accredited programs. The department faculty, in conjunction with the IAC for Mechanical ET, Electronics ET, Mechanical ET, and Occupational Safety, worked to create a plan that is broad enough to encompass all programs but flexible enough to meet the needs of the individual programs. This collaborative effort has resulted in a diverse initiative. Annual IAC and regular ABET meetings allow for discussion of continuous improvement from differing perspectives. This allows for sharing of ideas and viewpoints that would otherwise not be expressed or shared. This is especially beneficial to academic programs with few faculty members.

The following is a synopsis of the CIP. The CIP is scheduled for review and possible revision the Fall 2019 semester.

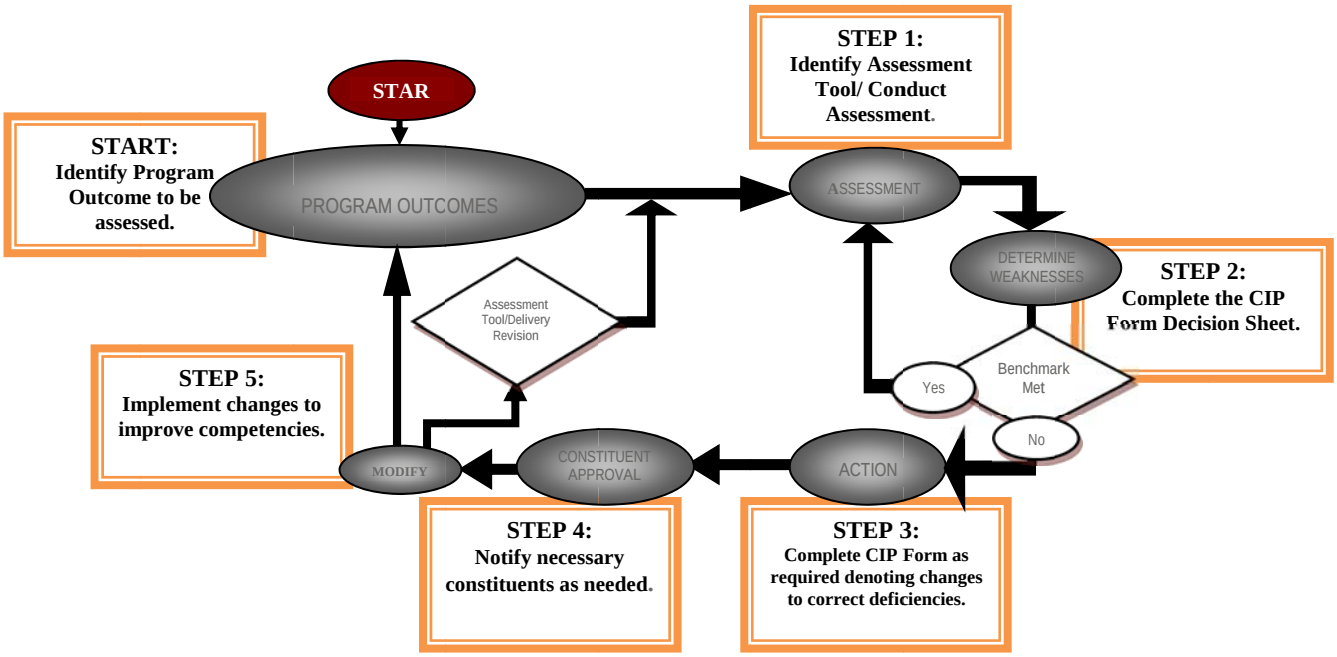
Terminology

The ANSAC and ETAC of ABET accredited programs at FSU use the following terms in its Continuous Improvement Plan and in meetings when discussing continuous improvement:

- **Assessment Points:** The intersection of the course and Student Outcome on the matrix denoted by ABET's legacy outcomes. Mapping to the new ABET 1-5 outcomes was shown in Criteria 3.
- **Assessment Tools**: Materials used to gather information for assessment purposes. Assessment tools are specific to the Program Outcomes 1-5. Examples include but are not limited to:
    - Exam questions,
    - Projects,
    - Quizzes,
    - Interviews,
    - Pre and Post exams,
    - Labs,
    - Other.
- **Assessment**: Process of gathering/utilizing assessment tool, and evaluation of assessment tools.
- **Determination of Weakness:** Evaluation of the assessed data in comparison to established benchmark.
- **Actionable Item:** Outcome falling below established benchmark.
- **Action:** Steps proposed for the elimination or control of the weakness.
- **Constituent Approval:** When necessary, the constituencies will be consulted on the intended action.
- **Continuous Improvement Plan:** A comprehensive plan developed and approved by the faculty and IACs used to evaluate outcomes against established benchmarks.
- **Modification:** Change to the Program Outcomes or elements relating to the outcomes.
- **Program Outcomes:** Statements that describe what students are expected to know and be able to do by the time of graduation. These relate to the skills, knowledge, and behaviors that students acquire in their matriculation through the program.

CIP Flowchart

Assessment of Program Outcomes is systematically conducted following the procedure specified in the CIP. This flowchart depicts the steps taken to gather and assess materials and modify either delivery or outcomes when established benchmark is not achieved.



Start: Identify Program Outcome to be Assessed

To begin the assessment process, the assessment point must be identified on the program's outcomes matrix. This matrix was developed by the program faculty and approved by the IAC. As seen in the matrix (Figure 4-2), the model schedule maps to Program Outcomes indicating which of ABET's outcomes is to be assessed. The example matrix shown was for the legacy outcomes and was used for continuous improvement planning throughout the six year cycle.

Program Outcomes

A.S, Mechanical Engineering Technology

	Course	1 (a,b)	2 (c,e)	3 (d,f)	4 (g,i)	5 (h)	6
Freshman First Semester 12 hrs	ENGL 1101						
	MATH 1510						
	TECH 1108						
	MANF 1100						
Freshman Second Semester 15 hrs	ENGL 1102						
	COMM 2200						
	MATH 1520						
	ELEC 1100						
	MECH 1100	A(a)			A(i)		A
Sophomore First Semester 18 hrs	PHYS 1101						
	ELEC 2250						
	MECH 2200		A(c)				A
	MECH 2210						A
	TECH 2290						
Sophomore Second Semester 16 hrs	PHYS 1102						
	MECH 2220			A(d,f)			A
	MECH 2240	A(b)	A(e)		A(g)	A(h)	A
	TECH 2208						
	Free elective						

Figure 4-2

Understanding the Matrix

As explanation to the coding of the matrix, Figure 3 clarifies the meaning of the notations. The left column contains the academic courses. The "A" indicates the course in which that competency is assessed. Lastly, the parenthetical notation specifies which ABET outcome is being assessed.

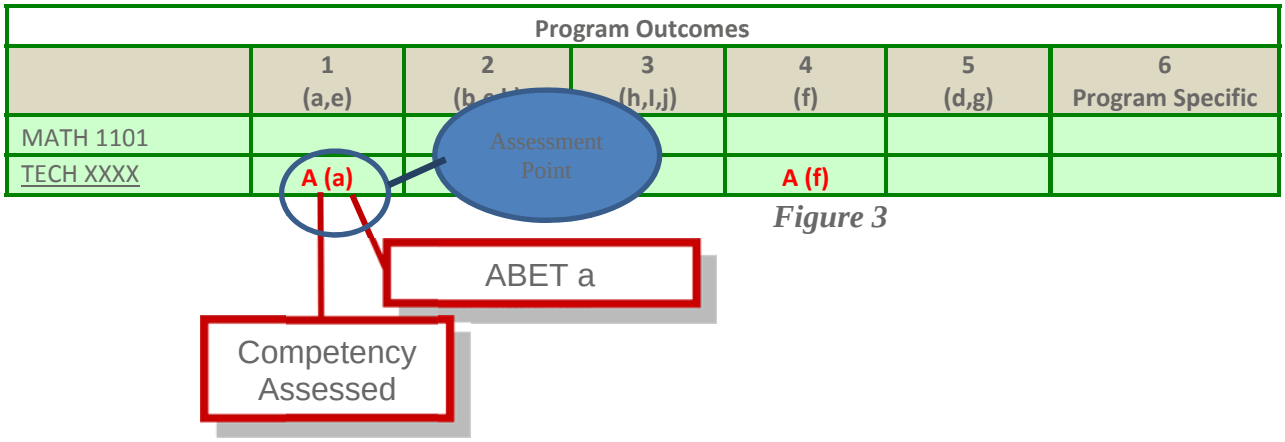


Figure 3

STEP 1: Identify Assessment Tool/ Conduct Assessment

For each assessment point on the matrix, there is an assessment tool developed and managed by the course professor. This tool may be an exam question, project, report, or quiz. The tool used may not be identical each time administered but is similar in content and depth of knowledge.

An example of an assessment tool is:

MECH 1100

1. Master and apply current knowledge, techniques, skills and modern tools of their disciplines including mathematics and science

   a. an ability to apply the knowledge, techniques, skills, and modern tools of the discipline to narrowly defined engineering technology activities

   Final Exam

***Used for assessment (Or similar project)**

Once the assessment is conducted, the work is graded/evaluated by the course professor. This may be as simple as the work being correct or incorrect or it may require the use of a grading rubric developed for the assignment.

STEP 2: Complete the CIP Decision Sheet

Once the student work is evaluated, the professor completes a CIP Decision Sheet. This form (Form 4-1), tracks the success of the assessment point in comparison to the established benchmark. If the benchmark is met or exceeded, this form is filed away, and the assessment point is collected and assessed again when required by the assessment cycle.

CI Form Continuous Improvement	2 Outcome Number	c ABET outcome	2200 Course Number

Program Name:	○ AS ○ BS Civil ET	◉ AS ○ BS Mechanical ET
	○ AS ○ BS Electronics ET	○ BS Occupational Safety

Date:	8/22/2016	Form Completed By: Jason Bolyard

1. Assessment Tool Example/Description (ie: exam, project description, homework problem)

Lab report

2. Established Benchmark: (ie: 70% of students achieve or exceed 80%) 70% of students achieve or exceed 70%

3. Assessment

◉ AC 1 ○ AC 2 ○ AC 3 Fall 2013	Fall 2014	Fall 15
Data Summary 76%	Data Summary 81%	Data Summary 94%

Aggrate Data (using the data collected for three years, record the percentage of students achieving or exceeding the established benchmark) 85%

Benchmark Met
- ◉ Yes (action not required)
- ○ No (action required - continue to Section 4)

4. Description of Weakness:

5. Description of Proposed Actions:

6. Implementation Plan:

Implementation Steps:	Implementation Date

Form 4-1

The course professor establishes the benchmark for that assessment point in their course. All assessed materials are measured against the benchmark system established in Figure 4-4. The targeted benchmark indicates that 70% of the students have met or exceeded the desired score or grade established by the assignment. Note that the benchmark has been approved by the IAC.

Figure 4-4

Assessment and Benchmarking

Once the assessment tool is completed by the students, the collected work is evaluated by the course professor. All assessed materials are measured against the benchmark system established in Figure 4. The targeted benchmark indicates that 70% of the students have met or exceeded 70% of the desired score or grade established by the assignment. Note that the benchmark has been approved by the IAC.

STEP 3: Complete CIP Form as Required Denoting Changes to Correct Deficiencies

When the benchmark is not met, this is considered substandard and actionable. The professor must complete a CIP Form (shown below, Form 4-2). This form requires the professor to identify and note the weaknesses, offer strategies for modifications (this can be related to material delivery, development, etc…), and share information or seek counsel of constituencies.

CI Form Continuous Improvement			1100 Course Number
	Outcome Number	ABET outcome	

Program Name:				
	○ AS ○ BS	Civil ET	◉ AS ○ BS	Mechanical ET
	○ AS ○ BS	Electronics ET	○ BS	Occupational Safety

Date:	8/19/2016	Form Completed By: Jason Bolyard

1. Assessment Tool Example/Description (ie: exam, project description, homework problem)

Final Exam, see attached

2. Established Benchmark: (ie: 70% of students achieve or exceed 80%) 50% of students achieve or exceed 70%

3. Assessment

◉ AC 1 ○ AC 2 ○ AC 3 Spring 2013	Spring 2014	Spring 15
Data Summary 45%	Data Summary 41%	Data Summary 65%

Aggrate Data (using the data collected for three years, record the percentage of students achieving or exceeding the established benchmark) 50%

Benchmark Met	○ Yes (action not required)
	◉ No (action required - continue to Section 4)

4. Description of Weakness:

Based upon the data collected, 70% of the course students did not achieve or exceed 70%

5. Description of Proposed Actions:

As part of the Title III Project the MECH 1100 is a targeted course. Tutors will be recruited for MECH 1100 and will be available to students.

6. Implementation Plan:

Implementation Steps:	Implementation Date
Tutors will be recruited and will be made available to students	Fall 16

Form 4-2

STEP 4: Notify Necessary Constituents as Needed

Constituencies may need to be notified of weaknesses as well as proposed changes. The IAC is briefed annually on the weaknesses identified in the collection and processing of Program Outcomes. Students, as constituents, are often notified of substandard performance when reviewing the material or if the assessment tool is deemed flawed in some way. Other program faculty members may be notified of findings if a change in delivery methodology is proposed or if the course faculty wants to move the assessment point.

The decision to present this information to the IAC is discussed during the Collaborative Report meeting. This is a meeting of program faculty conducted the first week of every semester to discuss the findings from the previous semester. These meetings produce reports that are filed in the ABET room, and reviewed with the IAC at the annual November meetings.

STEP 5: Implement Changes to Improve Competencies

The last step in the CIP is to implement changes by either changing pedagogy, or the outcome itself. At no point has a Program Outcome been changed. However, it is common to change the assessment tool, delivery methodology, or location (course) of the assessment. When weaknesses are identified, it is common for faculty to develop a new or revised assessment tool, attach it to the CIP and administer it during the next applicable cycle.

Assessment Cycle

As cited on the bottom row of the matrix and summarized in Figure 4-5, below, the assessment frequency is a three year cycle.

- Year 1: Assess Outcomes 1 and 2
- Year 2: Assess Outcomes 3, 4, and 5
- Year 3: Assess Outcome 6

Program Outcomes **Mechanical Engineering Technology**						
Course	1 (a,b)	2 (c,e)	3 (d,f)	4 (g,i)	5 (h)	6 (j-q)
	ASSESSMENT CYCLE ONE (AC1)		**ASSESSMENT CYCLE TWO (AC2)**			**ASSESSMENT CYCLE THREE (AC3)**

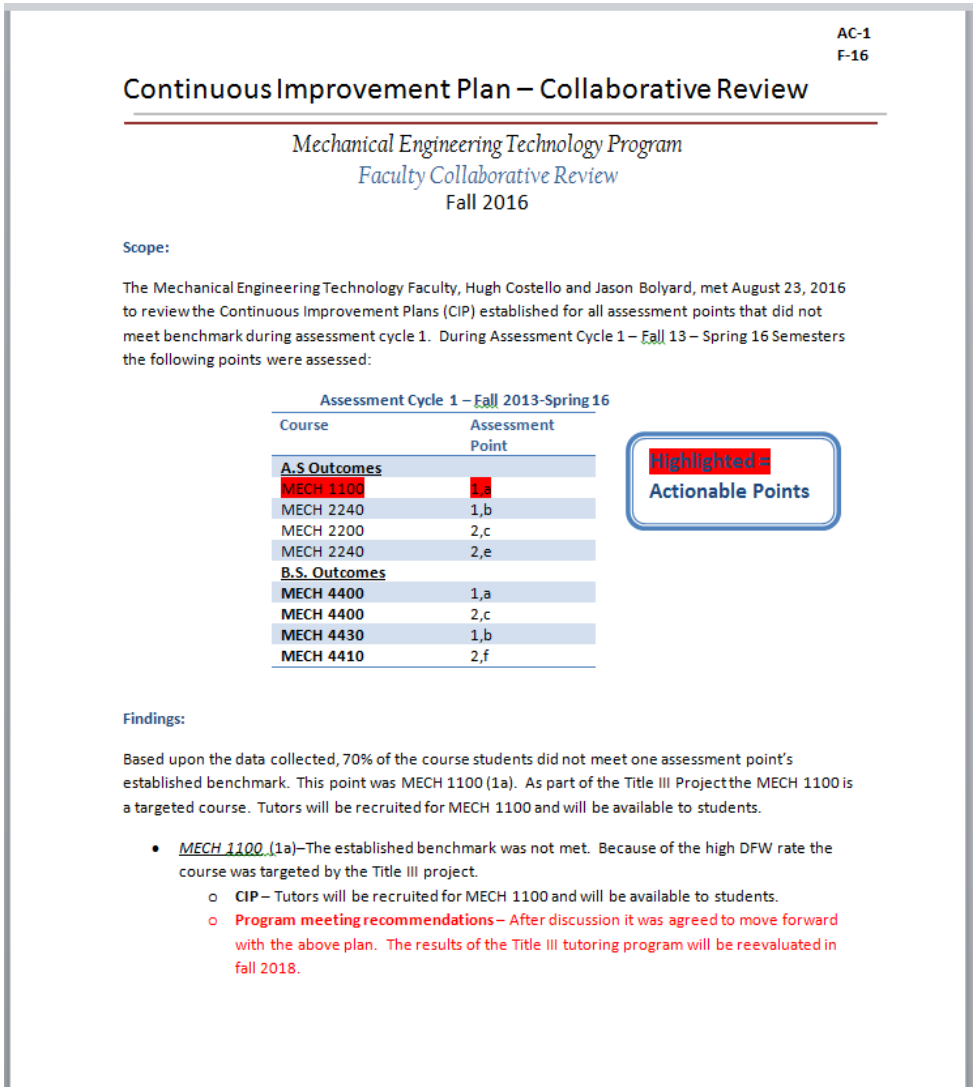
Figure 4-5

Maintenance and Management of Documents

All CIP documentation is maintained in a file system in the ABET room. Faculty are encouraged to utilize TaskStream to electronically file and manage the documents as well. The faculty are responsible for completing and filing all forms in order to track assessment results and required corrective measures.

Collaborative Report

As previously mentioned, program faculty meet during the first week of every semester to discuss actionable items from the previous semester's assessment points. These meetings allow for discussion and collaboration on corrective actions to substandard student performance. The reports are filed with the program coordinator and the ABET coordinator for future reference



AC-1
F-16

Continuous Improvement Plan – Collaborative Review

Mechanical Engineering Technology Program
Faculty Collaborative Review
Fall 2016

Scope:

The Mechanical Engineering Technology Faculty, Hugh Costello and Jason Bolyard, met August 23, 2016 to review the Continuous Improvement Plans (CIP) established for all assessment points that did not meet benchmark during assessment cycle 1. During Assessment Cycle 1 – Fall 13 – Spring 16 Semesters the following points were assessed:

Assessment Cycle 1 – Fall 2013-Spring 16

Course	Assessment Point
A.S Outcomes	
MECH 1100	1,a
MECH 2240	1,b
MECH 2200	2,c
MECH 2240	2,e
B.S. Outcomes	
MECH 4400	1,a
MECH 4400	2,c
MECH 4430	1,b
MECH 4410	2,f

Highlighted = Actionable Points

Findings:

Based upon the data collected, 70% of the course students did not meet one assessment point's established benchmark. This point was MECH 1100 (1a). As part of the Title III Project the MECH 1100 is a targeted course. Tutors will be recruited for MECH 1100 and will be available to students.

- *MECH 1100* (1a)–The established benchmark was not met. Because of the high DFW rate the course was targeted by the Title III project.
  - **CIP** – Tutors will be recruited for MECH 1100 and will be available to students.
  - **Program meeting recommendations** – After discussion it was agreed to move forward with the above plan. The results of the Title III tutoring program will be reevaluated in fall 2018.

B. Assessment Metrics and Methods of Student Outcomes

List the metric(s), measure(s) or performance indicator(s) used for each student outcome. Describe the process for collecting data or making assessments for each (tabular format is encouraged). Examples of assessment instruments can be electronically referenced in the self-study report and must be available for review at the time of the visit.

All assessment Metrics and Methods of SO's are shown in tabular format on the following pages.

C. Assessment Schedule and Frequency

Present the schedule and frequency for each type of assessment as well as points of accountability (tabular format is encouraged). Examples of assessments or data collected to date can be referenced electronically in the self-study report and must be available for review at the time of the visit.

All assessment schedule and frequency of SO's are shown in tabular format on the following pages.

D. Evaluation

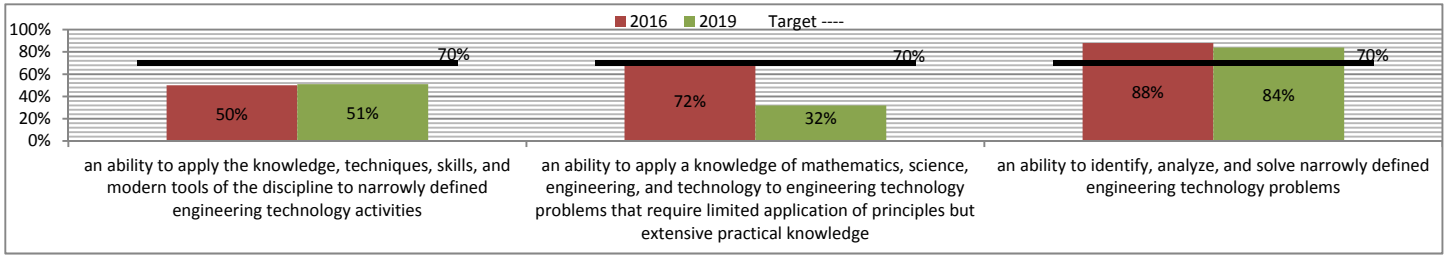
Present the evaluation schedule, points of accountability, and expected level of attainment for each student outcome. Provide summaries of the results of evaluation analyses over time illustrating current attainment of each student outcome and trends in attainment over time (tabular presentation is encouraged). Describe how results are communicated and preserved and provide one or more examples electronically or in appendices.

Assessment evaluation of SO's are shown in tabular format on the following pages. Descriptions are provided within the tables.

Student Outcome 1: *An ability to apply knowledge, techniques, skills and modern tools of mathematics, science, engineering, and technology to solve well defined engineering problems appropriate to the discipline*

Legacy Outcomes mapped to New ABET 1	Courses were outcome exists (MECH courses)	Specific Method of Assessment (rubric, etc.)	Courses Assessed (where the outcome and related data are collected)	Cycle of When the outcome Assessed (how often)	Year & Semester when Data Were Collected	Performance Target for outcome
a. an ability to apply knowledge, techniques, skills, and modern tools of the discipline to narrowly defined engineering technology activities;	1100 2200 2210 2220 2240	Direct: Final Exam Indirect: Student survey	MECH 1100	3 years	SPG 2014 SPG 2015 SPG 2016 SPG 2017 SPG 2018 SPG 2019	70%
b. an ability to apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require limited application of principles but extensive practical knowledge	1100 2200 2210 2220 2240	Direct: Final Exam Indirect: Student Survey	MECH 2240	3 years	SPG 2014 SPG 2015 SPG 2016 SPG 2017 SPG 2018 SPG 2019	70%
e. an ability to identify, analyze and solve narrowly defined engineering technology problems	1100 2200 2210 2220 2240	Direct: Case Study Indirect: Student Survey	MECH 2240	3 years	SPG 2014 SPG 2015 SPG 2016 SPG 2017 SPG 2018 SPG 2019	70%

Results of Evaluation of Aggregated Assessment Data:
Based on aggregated assessment data, provide evaluation and analysis to illustrate the extent to which the student outcome is being attained. Use of charts/graphs with an explanation is recommended.



Actions for Continuous Improvement:
Briefly list the actions for program improvement that have resulted from the results of evaluation processes described above. Indicate any significant future program improvement plans based upon recent evaluations. Provide a brief rationale for each of these planned changes. Details can be provided in the following report section.

Legacy outcome a was below benchmark when the data was analyzed in 2016. As part of the Title III Project the MECH 1100 is a targeted course. Tutors will be recruited for MECH 1100 and will be available to students.
Both targets were met when the data was analyzed in 2016 for legacy outcome b and e. However, when the data was analyzed in 2019 legacy outcome b was below benchmark. Improvements will implemented in the spring 2020 semester for legacy outcome b. Also, beginning Fall 2019, Performance Indicators will be implemented for this and all student outcomes.

Results of Actions for Improvement
Briefly describe the results of any changes (whether or not effective) in those cases where re-assessment of the results has been completed. Details can be provided in the following report section.

In 2019 legacy outcome a increased slightly over the results from 2016. Additional improvements will need to be addressed and implemented in the spring 2020 semester.

Assessment Instruments:
How are the assessment and evaluation results documented and maintained? Attach copies of the assessment instruments or materials referenced in your table. Attach samples of student work at various levels (poor, satisfactory, very good). This can be an appendix or separate file.

All assessment and evaluation results are documented on the departments Continuous Improvement (CI) form. The forms are filed in the Assessment file storage and reviewed when the cycle dictates. Annual faculty collaborative reports summarize all assessments and continuous improvement changes. Examples of the assessment instruments and student work will be in the on-site display

Student Outcome 2: *An ability to design solutions for well-defined technical problems and assist with engineering design of systems, components, or processes appropriate to the discipline*

There is no assessment data for Outcome 2. No link to legacy ABET outcomes exists. The data below is the planned performance indicators/assessments that will be collected and used for continuous improvement.

Performance Indicators (PI) for this outcome	Courses were PI exists (MECH courses)	Specific Method of Assessment (rubric, etc.)	Courses Assessed (where the PI and related data are collected)	Cycle of When the PI Assessed (how often)	Year & Semester when Data will be Collected	Performance Target for PI
1. Identify appropriate design solutions or requirements	1100 2200 2210 2220 2240	Direct: Final exam Indirect: Student survey	MECH 2210	2 years	SPG 2020 SPG 2022 SPG 2024	70%
2. Determine discipline specific systems, components or processes	1100 2200 2210 2220 2240	Direct: Final Exam Indirect: Student Survey	MECH 2210	2 years	SPG 2020 SPG 2022 SPG 2024	70%
3. Evaluate design solutions	1100 2200 2210 2220 2240	Direct: Final Exam Indirect: Student Survey	MECH 2210	2 years	SPG 2020 SPG 2022 SPG 2024	70%

Summary of Aggregated Assessment Data (across all PIs):
Describe how the assessment data from each PI is aggregated and provide an overall assessment data set. Use charts or formulas as necessary but include the numbers of students that were assessed.

Results of Evaluation of Aggregated Assessment Data:
Based on aggregated assessment data, provide evaluation and analysis to illustrate the extent to which the student outcome is being attained. Use of charts/graphs with an explanation is recommended.

Actions for Continuous Improvement:
Briefly list the actions for program improvement that have resulted from the results of evaluation processes described above. Indicate any significant future program improvement plans based upon recent evaluations. Provide a brief rationale for each of these planned changes. Details can be provided in the following report section.

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Results of Actions for Improvement
Briefly describe the results of any changes (whether or not effective) in those cases where re-assessment of the results has been completed. Details can be provided in the following report section.

Assessment Instruments:
How are the assessment and evaluation results documented and maintained? Attach copies of the assessment instruments or materials referenced in your table. Attach samples of student work at various levels (poor, satisfactory, very good). This can be an appendix or separate file.

Student Outcome 3: *An ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature*

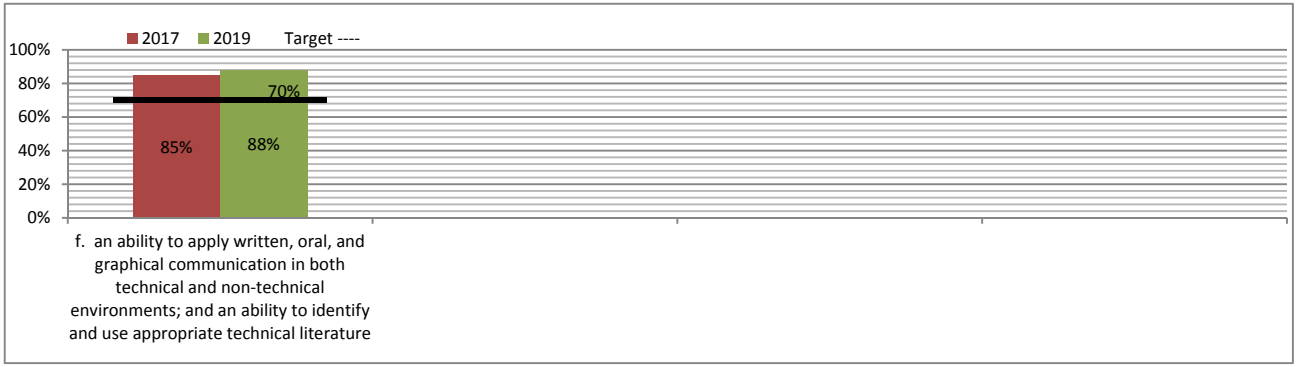
*Performance indicators were created Fall 2016. Prior to using the performance indicators, the legacy outcome "f" was measured with the same metrics and in the same course. The use of performance indicators captures the data in a more appropriate manor.

Legacy Outcomes mapped to New ABET 3	Courses were outcome exists (MECH courses)	Specific Method of Assessment (rubric, etc.)	Courses Assessed (where the outcome and related data are collected)	Cycle of When the outcome Assessed (how often)	Year & Semester when Data Were Collected	Performance Target for outcome
f. an ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature	2200 2220 2240	Direct: Lab Report Indirect: Student survey	MEHC 2220	3 years	Spring 2018 Spring 2019	70%

Summary of Aggregated Assessment Data (across all PIs):
Describe how the assessment data from each PI is aggregated and provide an overall assessment data set. Use charts or formulas as necessary but include the numbers of students that were assessed.

For summative assessment, the decision was made to focus on the direct assessment for all indicators.
Assessment data was analyzed in 2017 and again in 2019. The assessment data for MECH 2220 was not collected from 2015-2017 and was supplement with a similar assignment from MECH 2200. The 2017 data was based on 3 years of aggregated data (2013, 2014, 2015) from MECH 2200. The 2018 analysis was based on 2 years of aggregated data (2018, 2019) from MECH 2220. The average enrollment was 28. Also, beginning Fall 2019, Performance Indicators will be implemented for this and all student outcomes.

Results of Evaluation of Aggregated Assessment Data:
Based on aggregated assessment data, provide evaluation and analysis to illustrate the extent to which the student outcome is being attained. Use of charts/graphs with an explanation is recommended.



Actions for Continuous Improvement:
Briefly list the actions for program improvement that have resulted from the results of evaluation processes described above. Indicate any significant future program improvement plans based upon recent evaluations. Provide a brief rationale for each of these planned changes. Details can be provided in the following report section.

In spring 2017 it was realized that no data had been collected for the assessment in the MECH 2220 course. However there is a similar lab report assessment collected in the MECH 2200 course. The data from MECH 2200 was above benchmark at 85%. Adjustments will be made to insure the assessment data is collected.

Results of Actions for Improvement
Briefly describe the results of any changes (whether or not effective) in those cases where re-assessment of the results has been completed. Details can be provided in the following report section.

The lab report assessment in MECH 2220 was collected in both the spring 2018 and 2019 semesters. The aggregated data showed the assessment to be above benchmark.

Assessment Instruments:
How are the assessment and evaluation results documented and maintained? Attach copies of the assessment instruments or materials referenced in your table. Attach samples of student work at various levels (poor, satisfactory, very good). This can be an appendix or separate file.

All assessment and evaluation results are documented on the departments Continuous Improvement (CI) form. The forms are filed in the Assessment file storage and reviewed when the cycle dictates. Annual faculty collaborative reports summarize all assessments and continuous improvement changes. Examples of the assessment instruments and student work will be in the on-site display

Student Outcome 4: *An ability to conduct standard tests and measurements, and to conduct, analyze, and interpret experiments*

*This outcome is linked to legacy outcome "c". The legacy outcome was used to measure new Student Outcome 4.

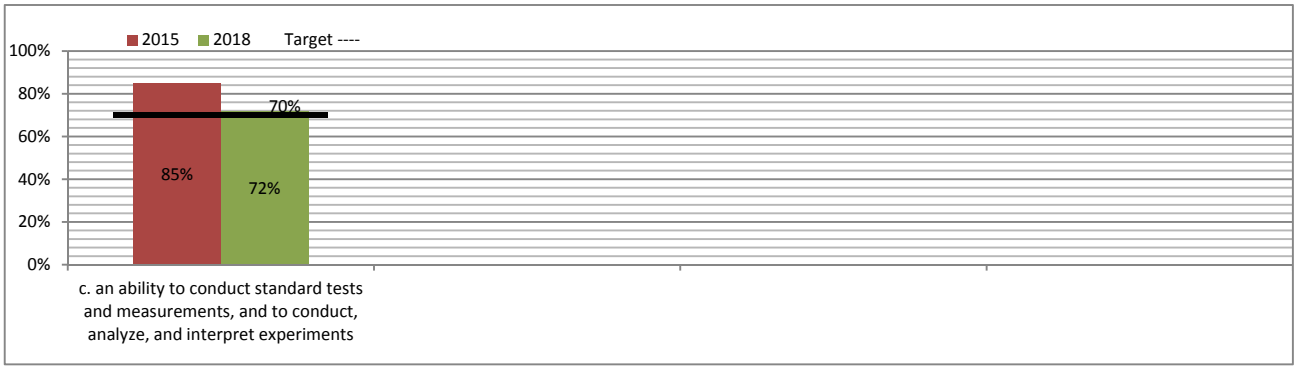
Legacy Outcomes mapped to New ABET 4	Courses were outcome exists (MECH courses)	Specific Method of Assessment (rubric, etc.)	Courses Assessed (where the outcome and related data are collected)	Cycle of When the outcome Assessed (how often)	Year & Semester when Data Were Collected	Performance Target for outcome
c. An ability to conduct standard tests and measurements, and to conduct, analyze and interpret experiments	2200 2220	Direct: Lab report Indirect: Student survey	MECH 2200	3 years	Fall 2013 Fall 2014 Fall 2015 Fall 2016 Fall 2017 Fall 2018	70%

Summary of Aggregated Assessment Data (across all PIs):
Describe how the assessment data from each PI is aggregated and provide an overall assessment data set. Use charts or formulas as necessary but include the numbers of students that were assessed.

For summative assessment, the decision was made to focus on the direct assessment for this outcome.

Assessment data was aggregated in 2015 and again in 2019. The 2015 analysis was based on 3-years of aggregated data (2013, 2014, 2015). The average enrollment was 40 students. The 2019 analysis was based on 3-years of aggregated data (2016, 2017, 2018). The average enrollment was 39 students. Also, beginning Fall 2019, Performance Indicators will be implemented for this and all student outcomes.

Results of Evaluation of Aggregated Assessment Data:
Based on aggregated assessment data, provide evaluation and analysis to illustrate the extent to which the student outcome is being attained. Use of charts/graphs with an explanation is recommended.



Actions for Continuous Improvement:
Briefly list the actions for program improvement that have resulted from the results of evaluation processes described above. Indicate any significant future program improvement plans based upon recent evaluations. Provide a brief rationale for each of these planned changes. Details can be provided in the following report section.

The target was met when the data was analyzed in 2015. No action required.

Results of Actions for Improvement
Briefly describe the results of any changes (whether or not effective) in those cases where re-assessment of the results has been completed. Details can be provided in the following report section.

The target was met in both 2015 and 2018.

Student Outcome 5: *An ability to function effectively as a member of a technical team*

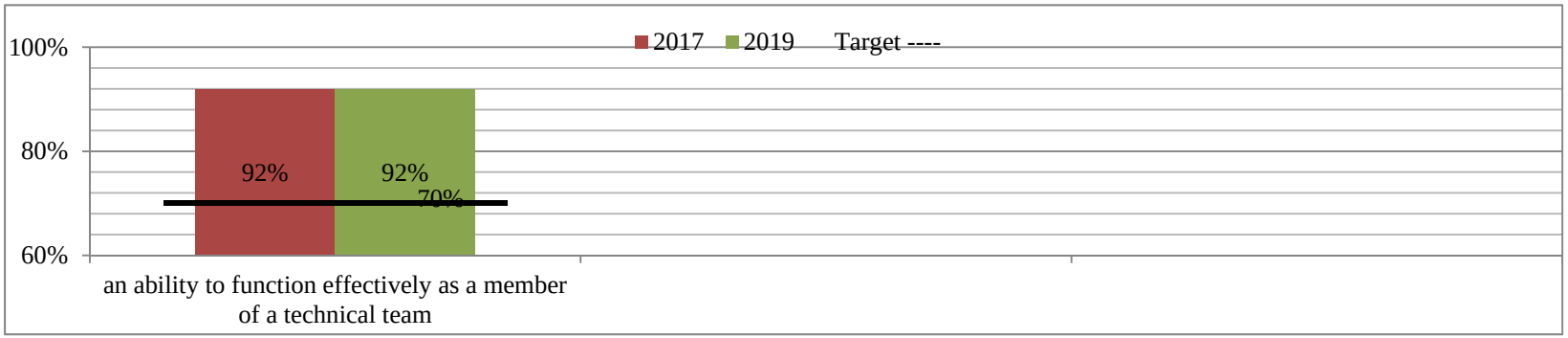
Legacy Outcomes mapped to New ABET 5	Courses were outcome exists (MECH courses)	Specific Method of Assessment (rubric, etc.)	Courses Assessed (where the outcome and related data are collected)	Cycle of When the outcome Assessed (how often)	Year & Semester when Data Were Collected	Performance Target for outcome
d. an ability to function effectively as a member of a technical team	2220 2240	Direct: Topography Lab, score sheet Indirect: Student survey	MECH 2220	3 years	Spring 2017 Fall 2018 Fall 2019	70%

Summary of Aggregated Assessment Data (across all PIs):
Describe how the assessment data from each PI is aggregated and provide an overall assessment data set. Use charts or formulas as necessary but include the numbers of students that were assessed.

For summative assessment, the decision was made to focus on the direct assessment for all indicators.

Assessment data was analyzed in 2017 and again in 2019. The assessment data for MECH 2220 was not collected from 2015-2017 and was supplement with a similar group assignment from MECH 2240. The 2017 data was based on 1 years of aggregated data (2017) from MECH 2240. The 2019 analysis was based on 2 years of aggregated data (2018, 2019) from MECH 2220. The average enrollment was 28. Also, beginning Fall 2019, Performance Indicators will be implemented for this and all student outcomes.

Results of Evaluation of Aggregated Assessment Data:
Based on aggregated assessment data, provide evaluation and analysis to illustrate the extent to which the student outcome is being attained. Use of charts/graphs with an explanation is recommended.



Actions for Continuous Improvement:
Briefly list the actions for program improvement that have resulted from the results of evaluation processes described above. Indicate any significant future program improvement plans based upon recent evaluations. Provide a brief rationale for each of these planned changes. Details can be provided in the following report section.

In spring 2017 it was realized that no data had been collected for the assessment in the MECH 2220 course. However there is a similar group assessment collected in the MECH 2240 course. The data from MECH 2240 was above benchmark at 92%. Adjustments will be made to insure the assessment data is collected

Results of Actions for Improvement
Briefly describe the results of any changes (whether or not effective) in those cases where re-assessment of the results has been completed. Details can be provided in the following report section.

The group lab report assessment in MECH 2220 was collected in both the spring 2018 and 2019 semesters. The 2018 assignment required the student to perform the lab in groups and the outcome was assessed based on each students lab report grade. The 2019 assessment was based on peer review scores. The aggregated data showed the assessment to be above benchmark.

Assessment Instruments:
How are the assessment and evaluation results documented and maintained? Attach copies of the assessment instruments or materials referenced in your table. Attach samples of student work at various levels (poor, satisfactory, very good). This can be an appendix or separate file.

All assessment and evaluation results are documented on the departments Continuous Improvement (CI) form. The forms are filed in the Assessment file storage and reviewed when the cycle dictates. Annual faculty collaborative reports summarize all assessments and continuous improvement changes. Examples of the assessment instruments and student work will be in the on-site display

E. Using Results for Continuous Improvement

Describe how the results of the evaluations (from section D above) and any other available information are systematically used as input in the continuous improvement of the program. Present points of accountability, schedule and frequency. Summarize deliberations, decisions and actions which have been implemented as a result of these evaluations and indicate any significant future program improvement plans including the rationale for each. Provide references in the appendices or electronically as evidence of deliberations and decisions on improvements and input used. Evidence might include evaluation reports, agendas, minutes, memos, etc.

The table above has boxes for this information. The program should describe the use of the results for individual Student Outcomes in the table above and summarize the use for all Student Outcomes in Section E.

Program changes due to assessment findings are explained and documented through the use of the Collaborative Review Reports for the program. The collaborative reports identify all assessed points under that assessment cycle, all actionable items, and offer a summary of modifications for improvement. These collaborative reports are shared with the IAC and feedback is provided by the IAC.

Indirect data is also used for continuous improvement. Each academic year, students are surveyed to provide indirect measurement of outcome success. Faculty review the surveys for points that do not meet benchmark or are repeatedly noted in student comments. This is also documented in the Collaborative review reports.

Major program changes are not implemented until multiple assessment cycles (in a row) demonstrate student performance below benchmark. Instructional and delivery methods are tweaked every semester to meet the needs of the student population. For example, delivery methods that may vary include in-class examples, homework problems, project scenarios, lab exercises, etc. All collaborative reports shall be provided to the evaluator during site visit.

CRITERION 5. CURRICULUM

A. Program Curriculum

The applicable program criteria could include statements that add specificity to the curricular requirements found in Criterion 5 to differentiate the discipline designated by the program's title. These should be included in the program's coursework. Contact ABET at etac@abet.org if you have questions about the program criteria that apply to your program.

1. Complete Table 5-1 that describes the plan of study for students in this program including information on course offerings in the form of a recommended schedule by year and term along with average section enrollments for all courses in the program over the two years immediately preceding the visit. State whether the program is based on a quarter system or a semester system and complete a separate table for each option in the program.

2. Describe how the curriculum aligns with the program educational objectives.

Curriculum Aligns with Program Objectives

The lower level major and general studies courses in the curriculum are chosen and developed to build a foundation for students regarding math, science, and liberal sciences. These learned competencies are then used in upper level courses to develop professional aptitudes. Table 5-2, below indicates how all courses align with the Program Objectives.

Program Objectives *"broad statements that describe the career and professional accomplishments that the program is preparing graduates to achieve at the time of graduation and during the first few years following graduation." Graduates shall be competent in*	***Course Alignment***		
	General Studies	***Major Courses other than Mechanical Courses***	***Mechanical Courses***
1. Relate the concepts of self-directed lifelong learning and the ability to undertake further study and/or examinations specific to the discipline through demonstration of technical skills as a practicing professional, applying knowledge and discipline specific tools..		MATH 1510, MATH 1520, TECH 1108, TECH 2208, TECH 2290, TECH 3300, MANF 1100, ELEC 1100, ELEC 2250, PHYS 1101, PHYS 1102,	MECH 1100 MECH 2200 MECH 2210 MECH 2220 MECH 2240
2. Evaluate results and develop professional documents relevant to the discipline and to communicate such findings to a technical and non-technical audience.	ENGL 1101, 1103 COMM 2200	TECH 1108, TECH 2208	MECH 2200 MECH 2220 MECH 2240
3. Operate effectively in a diverse, multi-disciplinary environment demonstrating skills in leadership, professionalism and teamwork.			MECH 2220 MECH 2240

Table 5-2

3. Describe how the curriculum and its associated prerequisite structure support the attainment of the student outcomes.

Prerequisite Structure Supports Program Outcomes

Prerequisites are assigned to each course to ensure that the students enter the course with the necessary competencies to successfully meet course outcomes. These prerequisites and course outcomes are clearly defined on the course syllabus. Table *5-3* below summarizes the necessary prerequisites for each course in the program.

For example, in the Mechanical Engineering Technology program, Math, Technology, and Science skills are essential for many of the upper level Mechanical Engineering Technology courses. Therefore, these courses are listed as pre-requisites for courses such as Structures and Environmental Engineering Technology.

4. Attach a flowchart or worksheet that illustrates the prerequisite structure of the program's required courses.

A.S.E.T in Mechanical Engineering Technology				
Current Program				
Required Courses			**Credits**	**Prerequisites**
COMM	2200	Intro to Human Communication	3	English 1101
TECH	1108	Engineering Graphics I	3	None
TECH	2208	Engineering Graphics II	3	TECH 1108
ENGL	1101	Written English I	3	Test Scores
	1102	Written English II	3	English 1101
ELEC	1100	Circuit Analysis I	3	Math 1510
	2250	AC-DC Machinery and Controls	3	ELEC 1100
MANF	1100	Materials and Processes	3	None
MATH	1101	Applied Technical Math I	3	Test Scores
	1102	Applied Technical Math II	3	Math 1510
MECH	1100	Statics	3	Math 1520
	2200	Strength of Materials	4	Math 1520, Mech 1100
	2210	Thermodynamics	3	Mech 1100
	2220	Fluid Mechanics	3	Mech 2200, Tech 2290
	2240	Machine Design I	3	Mech 2200, Tech 2290
PHYS	1101	Introduction to Physics I	4	Math 1102
	1102	Introduction to Physics II	4	Physics 1101
TECH	2290	Engineering Analysis I	4	Math 1102
Free Elective			2	
		Total Course Hours	60	

Table 5-3

5. Describe how your program meets the specific requirements for this program area in terms of hours and depth of study for each curricular area (Math and Basic Sciences, Discipline Specific Topics) specifically addressed by either the general criteria or the specific program criteria as shown in Table 5-1. It is helpful to describe how the coverage of algebra and trigonometry (for A.S. programs) or differential and integral calculus or other mathematics above the level of algebra and trigonometry (for B.S. programs) is accomplished. Please describe how the curriculum develops student proficiency in the use of equipment and tools common to the discipline is appropriate to the student outcomes and the discipline.

Curricular areas that have been identified by ABET's general criteria include competencies in algebra, trigonometry, and Natural Sciences. Table 5-4 below outlines the terms of hours needed and the depth in which those competencies are used in the Mechanical Engineering Technology Program. The courses and methods used to cover the program specific criteria can be found in the Program Criteria section of this report

Competency Area	Credit Hours	Contact Hours	Demonstration of Depth of Study: Mechanical ET Courses in which Competencies are used
Math (Algebra, Trigonometry, Statistics, Calculus)	10	10	MECH 1100, 2200, 2210, 2220, 2240
Natural Sciences (Physics)	8	12	MECH 2200, 2210, 2220, 2240

Table 5-4

6. Describe how the curriculum accomplishes a capstone or culminating experience (addressed by either the general or program criteria) and describe how this experience helps students attain related student outcomes as appropriate to the discipline and the degree (not degree level). Such description should give, consideration to factors such as engineering standards and codes; public health and safety; and local and global impact of engineering solutions on individuals, organizations and society.

Courses Requiring Cumulative Knowledge

The Mechanical Engineering Technology program's MECH 2240 Machine Design course addresses ABET's program specific machine design requirement. This course requires a fundamental understanding of statics, strength of materials, thermodynamics and fluid mechanic. An understanding of basic statics and strength of materials is required to understanding three dimensional analyses of structures and combined stresses. Competences in thermodynamics are required to understand work and energy that is required in mechanical device. There are also fluid mechanics fundamentals required in hydraulic systems. The course includes homework, exams, and case studies that combine these topics. The case studies are small projects that required drafting, design, analysis, and selection of mechanical systems.

7. Describe how professional and ethical responsibilities, respect for diversity, and quality and continuous improvement are addressed in the curriculum.

Legacy outcome “h” states: an understanding of and a commitment to address professional and ethical responsibilities, including a respect for diversity. This outcome moved into curriculum beginning in the Spring of 2019. Having been part of the previous outcomes/assessment plan, these topics are covered in MECH 2240, Machine Design course. The course covers topics such as engineering ethics, diversity and inclusion in lecture and class exercises.

Legacy outcome “i” states: a commitment to quality, timeliness, and continuous improvement. This outcome moved into curriculum beginning in the Spring of 2019. Having been part of the previous outcomes/assessment plan, these topics were covered in MECH 1100 Statics. The course structure incorporated continuous improvement through multiple levels of assignments (homework, quizzes, and exams). This gives student the opportunity to assess their understanding on a lower level assignment (homework or quiz) and improve on the higher level assignment (exam). The Ideas of timeliness and quality were incorporated into the expectations and feedback for the course assignments.

8. If your program allows cooperative education or internships to satisfy curricular requirements specifically addressed by either the general or program criteria, describe the academic component of this experience and how it is evaluated by the faculty.

The Mechanical Engineering Technology program does not have a formal internship or cooperative education program. These activities are encouraged and are advertised by the faculty members when opportunities arise.

9. Describe by example how the evaluation team will be able to relate the display materials, i.e. course syllabi, textbooks, sample student work, etc., to each student outcome. (See the 2019-2020 APPM Section I.E.5.b. (2) regarding display materials.)

Display Materials at the Time of the Visit-Evaluators will review samples of displayed course materials including course syllabi, textbooks, example assignments and exams, and examples of student work, typically ranging from excellent through poor for only those courses that:

a) support attainment of the program’s student outcomes; and

b) develop subject areas supporting attainment of student outcomes or contained in specific program criteria requirements.

At the program's discretion, other materials that document efforts made to continuously improve curricula, or that illustrate novel, unusual or creative efforts to enrich the curriculum and/or attainment of student outcomes may be provided.

Wherever possible, materials should be provided online or electronically.

For all programs, evidentiary displays during the visit will thoroughly represent the Program Objectives, Course Information, and Program Outcomes. The following displays will be developed and presented to the visiting teams.

1. Program Objectives: Since these are delivered and assessed through the use of various tools, all examples will be compiled and displayed for perusal. This includes the following:
   a. Exit interviews:
      Graduating seniors are interviewed by a third-party prior to graduation. Information garnered is used to make modifications to the program, courses, or delivery of materials.
   b. Meeting minutes from Industrial Advisory Committee, Employers, and Alumni

2. Course Information: For each major course, there will be provided a syllabus, textbook (where applicable), laboratory assignments (where applicable), and other course materials provided by the faculty.

3. Program Outcomes: Since this is the most vital component of the CIP, each outcome will be presented with distinct mapping to the courses that support it. Figure 5-1 represents the process that will be used for the visit.

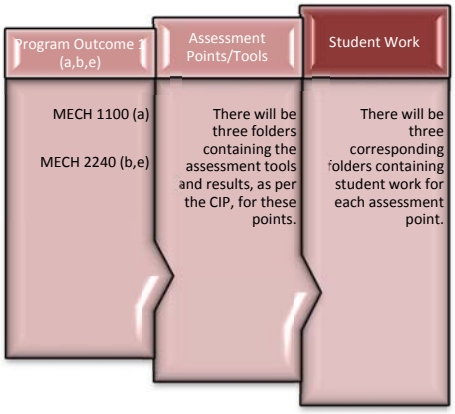


Figure 5-1

Each Program Outcome and the assessment point and tool will be displayed, and explained. Furthermore, the CIP information will be provided with the Program Outcomes indicating actionable items and modifications to correct. Lastly, the student work samples for those outcomes will be available for review.

B. Course Syllabi

In Appendix A of the Self-Study Report, include a syllabus for each course used for the degree.

C. Advisory Committee

Describe the composition of the program's advisory committee and describe how it is representative of organizations being served by the program's graduates. Describe activities of the advisory committee and provide evidence that it periodically reviewing the program's curriculum and advising the program on its program educational objectives and the current and future aspects of the technical fields for which the graduates are being prepared.

The Mechanical Engineering Technology's industrial advisory committee (IAC) is composed of individuals from local industry. The main industries that our program serves are the transportation, electricity production, and coal/gas industries. The advisory committee members are employed and have inside knowledge in these industries. Please see the following table of committee members and their employer and expertise.

Name	Employer	Job description
Martin Sheets	Pratt & Whitney	Engine Services Engineer
David Slakes	Pratt & Whitney	Engine Services Engineer
Ryan Jones	Caterpillar	Product Support Specialist Material Handling & Underground Division
Abraham Jones	EQT	Construction Engineering Manager
Dusty Smith	EQT	Engineer Compression Tech Services
Kyle Hamilton	Ford Dealership	Owner
Thomas Armentrout	First Energy	Engineer IV Harrison Power Station

Table 5-5

The IAC meets annually to discuss trends, offer guidance, and review and support the continuous improvement initiatives of the program.

Table 5-1 Curriculum

Associate of Science: Mechanical Engineering Technology

Course (Department, Number, Title) List all courses in the program by term starting with first term of the first year and ending with the last term of the final year.	Indicate Whether Course is Required, Elective, or a Selective Elective by an R, an E or an SE[2]	*Curricular Area (Credit Hours)*				Last Two Terms the Course was Offered: Year and Semester	Average Section Enrollment for the Last Two Terms the Course was Offered[1]
		Math and Basic Sciences	Discipline Specific Topics	General Education	Other		
MANF, 1100, Materials and Processes	R		3 hour			*S19, F18*	*22*
TECH, 1108, Engineering Graphics	R		3 hours			*S19, F18*	*24*
ENGL, 1101, Written English 1	R			3 hours		*S19, F18*	*24*
MATH, 1510, Applied Technical Math 1	R	3 hours				*S19, F18*	*24*
ELEC, 1100, Circuit Analysis I	R		3 hours			*S19, F18*	*27*
MATH, 1520, Applied Technical Math 2	R	3 hours				*S19, F18*	*24*
COMM, 2202, Communication in the World of Work	SE			3 hours		*S19, F18*	*24*
MECH, 1100, Statics	R		3 hours			*S19, F18*	*20*
ENGL, 1102, Written English II	R			3 hours		*S19,F18*	*24*
MECH, 2200, Strength of Materials	R		4 hours			*S19, F18*	*20*
PHYS, 1101, Physics I	R	4 hours				*S19, F18*	*24*
ELEC, 2250, AC/DC Machinery	R		3 hours			*F18, F17*	*23*
MECH, 2210, Thermodynamics I	R		3 hours			*F18, F17*	*29*
TECH , 2290, Engineering Analysis 1	R	4 hours				*S19, F18*	*24*
PHYS, 1102, Physics II	R	4 hours				*S19, S18*	*17*
MECH, 2220, Fluid Mechanics	R		3 hours			*S19, S18*	*29*
MECH, 2240, Machine Design	R		3 hours			*S19, S18*	*22*
TECH, 2208, Engineering Graphics II	R		3 hours			*S19, S18*	*12*
Free Elective	E				2 hour	*Varies*	*Varies*
OVERALL TOTAL CREDIT HOURS FOR THE DEGREE		18	31	9	2		
PERCENT OF TOTAL		*30%*	*51.7%*	*15%*	*3.3%*		

1. For courses that include multiple elements (lecture, laboratory, recitation, etc.), indicate the average enrollment in each element.
2. Required courses are required of all students in the program, elective courses are optional for students, and selected electives are courses where students must take one or more courses from a specified group.

Instructional materials and student work verifying compliance with ABET criteria for the categories indicated above will be required during the campus visit.

CRITERION 6. FACULTY

A. Faculty Qualifications

Describe the qualifications of the faculty and how they are adequate to cover all the curricular areas of the program and also meet any applicable program criteria. This description should include the composition, size, credentials, and experience of the faculty. Complete Table 6-1. Include faculty curriculum vitae in Appendix B.

The Mechanical Engineering Technology program is supported by two full-time faculty members. Each of the faculty member's qualifications are discussed below offering justification for expertise in given areas.

- **Jason Bolyard, PE**– Jason Bolyard has earned a BS degree in Civil Engineering Technology, MS Mechanical Engineering and is pursuing a Ph.D. in Mechanical Engineering. Mr. Bolyard has over 2 years of industrial experience in general industry. Course work and research in MS and Ph.D. degrees has focused on thermal sciences and fluid mechanics

- **Hugh Costello, PE** – Hugh Costello has earned a BS degree in Mechanical Engineering and MS degree in Mechanical Engineering. Professor Costello has over 25 years of industrial and academic experience. He has worked as a mechanical design engineer for several well-known organizations.

Table *6-1* is provided to summarize faculty qualifications.

Table 6-1. Faculty Qualifications

Mechanical Engineering Technology

Faculty Name	Highest Degree Earned- Field and Year	Rank [1]	Type of Academic Appointment [2] T, TT, NTT	FT or PT [3]	Years of Experience			Professional Registration/ Certification	Level of Activity [4] H, M, or L		
					Govt./Ind. Practice	Teaching	This Institution		Professional Organizations	Professional Development	Consulting/summer work in industry
Jason Bolyard	MS, Mechanical Engineering- 2005	ASC	T	FT	2	11	11	PE	L	H	L
Hugh Costello	MS, Mechanical Engineering- 1985	ASC	T	FT	25	10	10	PE	M	H	M
James Vassil	MS, Civil Engineering- 2001	ASC	T	FT	9	18	18	PE	M	H	H
Tabitha Lafferre	MS, Civil Engineering- 2018	AST	TT	FT	3	3	3	EI	H	H	H

Instructions: Complete table for each member of the faculty in the program. Add additional rows or use additional sheets if necessary. Updated information is to be provided at the time of the visit.

1. Code: P = Professor ASC = Associate Professor AST = Assistant Professor I = Instructor A = Adjunct O = Other
2. Code: TT = Tenure Track T = Tenured NTT = Non-Tenure Track
3. At the institution
4. The level of activity, high, medium or low, should reflect an average over the year prior to the visit plus the two previous years.

B. Faculty Workload

Complete Table 6-2, Faculty Workload Summary and describe this information in terms of workload expectations or requirements for the current academic year.

Workload Expectations

For the current academic year faculty workload expectations are in line with previous years and university guidelines.

Both full-time faculty in the Mechanical Engineering Technology program spend between five and ten percent of their professional initiatives in maintaining professional licensure (both are Professional Engineers in the state of WV). In addition to teaching upwards of 12 credit hours per semester, Mr. Bolyard serves as the program coordinator for the Mechanical Engineering Technology program and Mr. Costello serves as the Department of Technology chair.

Professor Bolyard instructed his regular 12 hour course load which included thermodynamics, heat transfer, fluid mechanics, mechanical measurement, and HVAC courses. He also serves on college and university committees, advises students, performs accreditation maintenance, and continues to earn professional development hours. Mr. Bolyard is the program coordinator and oversees the program including managing the program budget.

Professor Costello instructs statics, dynamics, and machine design courses. He also instructs courses in engineering analysis within the technology department that serves all the engineering technology programs. In addition to his teaching load, Mr. Costello serves as the Technology Department Chair. This requires the management of all of the technology department programs. This includes management of faculty, courses schedules, and budget. He also serves on college and university committees, advises students, performs accreditation maintenance, and continues to earn professional development hours.

C. Faculty Size

Discuss the adequacy of the size of the faculty and describe the extent and quality of faculty involvement in interactions with students, student advising, and oversight of the program.

The Mechanical Engineering Technology program is served by two full-time faculty members for an average enrollment between 100-130 students per year. The academic advising is evenly divided between the faculty members so that each one is responsible for advising approximately 30-40 students. Faculty also share the responsibilities of other students activities including but not limited to SAE Student Chapter, ASME Student Chapter, site tours, internship and employment assistance and curriculum management. With the enrollment trend for the Mechanical ET program, a minimum of 2 faculty members is needed to maintain a strong viable program.

D. Professional Development

Provide a description of program professional development support for faculty and a general description of how faculty avail themselves of these opportunities (specific recent activities for each faculty member should be noted in their CV in Appendix B).

Table 6-3 below summarizes the professional development activities for the Mechanical Engineering Technology full-time faculty members.

Full-time Faculty Member	Professional Development Activities for 2018-2019
Jason Bolyard, PE	• 30 hours biannually to meet licensure requirements • Ph.D. coursework (Advanced Calculus course 3hr) • Ph.D. research proposal
Hugh Costello, PE	• 30 hours biannually to meet licensure requirements • FE review sessions

Table 6-3

E. Authority and Responsibility of Faculty

Describe the role played by the faculty with respect to course creation, modification, and evaluation, their role in the definition and revision of program educational objectives and student outcomes, and their role in the attainment of the student outcomes. Describe the roles of others on campus, e.g., dean or provost, with respect to these areas.

Role of Faculty in Curricular Concerns

Faculty members are considered program and content experts in their respective disciplines of study. As such, they maintain full autonomy over their respective programs of study. Faculty is expected to design the best possible programs of study, course and program outcomes, and extra-curricular activities to support student learning. At Fairmont State University, ABET faculty are expected to participate in ABET assessment and meet with their industrial advisory committees on a yearly basis to review the programs of study being offered in the Technology Department at Fairmont State University.

The Department of Technology's ABET accredited programs maintain a Continuous Improvement Plan that assists faculty in assuring that programs and course outcomes are being met and that the programs of study are relevant based on the business and industrial needs of our constituents. The faculty work directly with their industrial advisory committees to review faculty or student issues associated with meeting program and student outcomes and objectives.

The Role of Administration in Curricular Concerns

Administration relies heavily on faculty to assure that quality program of study are being offered at the institution. However, upper administration does not micromanage course or program outcomes or course development. The Dean of the College of Science and Technology and Provost are charged with monitoring the progress that students are making in program and course outcomes. Every five years, each program of study is reviewed by the institution to assure program quality and a sufficient number of graduates are able to enter the workforce. This data is reported to the West Virginia Higher Education Policy Council and the Board of Governors at Fairmont State University. Procedures are in place to address deficiencies in programs should the need arise.

All curriculum changes must be approved by the Curriculum Committee on the campus of Fairmont State University. Changes in curricula produce reactions that may be far-reaching in their effects. It is, therefore, important that all proposed changes be studied carefully before they are made.

1) An academic unit that wishes to propose a change in its curriculum should begin by communicating the nature of the change to all the faculty of the unit. The opinions of the unit's faculty should be reflected in the report of the proposed change, and proposals for curriculum changes should be forwarded only when they enjoy the support of the faculty of the unit. It is the Dean's role in the College of Science and Technology to assure that all faculty have access to the proposed curriculum, issues are addressed that may result from the curriculum change, and that faculty have an opportunity to vote on the proposed changes.
2) Proposals for change originating in academic units are forwarded to the Provost and Vice President for Academic Affairs [through the Associate Provost], who will be responsible for initial evaluation and recommendation.
3) After evaluating and consulting with the proposal's sponsors and other interested parties, the Provost and Vice President for Academic Affairs will recommend that the proposal be accepted, rejected, or modified; the proposal and recommendation are then submitted to the Curriculum Committee.
4) The Provost and Vice President may initiate proposals for curriculum change. The Provost and Vice President's proposals may be of two types: (a) those affecting existing instructional programs and academic units and (b) those bearing on the creation of new programs. Proposals of the first type should be submitted to the affected unit for its approval. Proposals of the second type should be submitted to the Academic Affairs Council for its approval. The position of the body is then included in the report forwarded to the Curriculum Committee.
5) The Curriculum Committee then reviews the decisions of the Provost and Vice President for Academic Affairs, especially those of major importance to the University and those receiving negative recommendations. The Curriculum Committee also must hear appeals from any member of the faculty or any School of the University.
6) All actions taken by the Curriculum Committee are to be reported at regular intervals to the Faculty Senate, where final decisions concerning all curriculum matters will be made. In the case of rejected proposals, reversals of the Provost

and Vice President's recommendations, or decisions that have been appealed, the Curriculum Committee must supply the Senate with detailed information.

The following deadlines are to be used when determining the "Implementation Date Requested" entry on curriculum proposals:

Any curriculum change that is to become effective at the beginning of a school year must be approved before January 1 of the preceding academic year. Any change that is to become effective at the beginning of a spring semester must be approved before the end of the preceding year. It should be noted that "approved" in this instance means final approval by the Faculty Senate or, if appropriate, by the Higher Education Policy Commission.

All institutional grant proposals, regardless of the source of funding, which propose the creation of new academic programs, must be approved by the Board of Governors prior to submission to the funding agency.

The Higher Education Policy Commission requires the President of the University to inform the Board as soon as the institution begins to plan for the addition or deletion of an academic degree program.

Each institution must submit to the Board formal proposals for new academic programs in conformity with the currently approved Procedures and Format for the Submission of New Academic Program Proposals.

Table 6-2. Faculty Workload Summary

Mechanical Engineering Technology

Faculty Member (name)	PT or FT[1]	Classes Taught (Course No./Credit Hrs.) Term and Year[2]	Program Activity Distribution[3]			% of Time Devoted to the Program[5]
			Teaching	Research or Scholarship	Other[4]	
Jason Bolyard	FT	MECH 2210, 3hrs- Fall 2018	75	10	15	90
		MECH 3330, 3hrs- Fall 2018				
		MECH 4400, 3hrs- Fall 2018				
		MECH 4410, 3hrs- Fall 2018				
		MECH 2220, 3hrs- Spring 2019				
		MECH 3300, 3hrs- Spring 2019				
		MECH 3340, 3hrs- Spring 2019				
		MECH 4430, 3hrs- Spring 2019				
Hugh Costello	FT	MECH 3320, 3hrs- Fall 2018	65	10	25	80
		TECH 3300, 4hrs- Fall 2018				
		MECH 1100, 3hrs- Spring 2019				
		MECH 2240, 3hrs- Spring 2019				
		TECH 2290, 4hr- Spring 2019				
James Vassil	FT	MECH 1100, 3hrs- Fall 2018	100			40
		MECH 1100, 3hrs- Fall 2018				
		MECH 1100, 3hrs- Spring 2019				
		MECH 1100, 3hrs- Spring 2019				
Tabitha Lafferre	FT	MECH 2200, 4hrs- Fall 2018	100			40
		MECH 2200, 4hrs- Fall 2018				
		MECH 2200, 4hrs- Spring 2019				

1. FT = Full Time Faculty or PT = Part Time Faculty, at the institution
2. For the academic year for which the Self-Study Report is being prepared.
3. Program activity distribution should be in percent of effort in the program and should total 100%.
4. Indicate sabbatical leave, etc., under "Other."
5. Out of the total time employed at the institution. *If a faculty member teaches for more than one program or is an administrator, indicate level of effort for only specific program activities (teaching, etc.).*
6. *Do not include faculty in units that teach service courses, e.g., math or science.*

CRITERION 7. FACILITIES[1]

A. Offices, Classrooms and Laboratories

Summarize each of the program's facilities in terms of their ability to support the attainment of the student outcomes and to provide an atmosphere conducive to learning.

1. Offices (such as administrative, faculty, clerical, and teaching assistants) and any associated equipment that is typically available there.

2. Classrooms and associated equipment that are typically available where the program courses are taught.

3. Laboratory facilities including those containing computers (describe available hardware and software) and the associated tools and equipment that support instruction. Include those facilities used by students in the program even if they are not dedicated to the program and state the times they are available to students. Complete Appendix C containing a listing of the major pieces of equipment used by the program in support of instruction.

The Engineering Technology Center on the main campus of Fairmont State University currently houses the Department's administrative, faculty, clerical offices, classrooms and labs. The facilities are equipped with the tools needed for faculty to appropriately guide students in the attainment of the student educational outcomes. The layout and atmosphere are intended to be conducive to learning. Laboratory and Classroom equipment is regularly maintained an upgraded as needed.

The main office is located on the third floor near the main entrance; most faculty offices are of the fourth floor. The office for the Dean of College of Science and Technology is located on the second floor.

Mechanical Engineering Technology classes are mostly held on the first and third floor of The Engineering Technology Center. These rooms can seat up to 32 students and are equipped to allow instructors to present using digital projectors. The third and fourth floor have auditoriums that can seat 120 students.

Laboratories are located on the first floor of the Engineering Technology Center. Labs are equipped as seen in Appendix C. Instructors can cover all labs necessary for the Mechanical Engineering Technology program including, but not limited to material testing, fluid mechanics, and computer simulations.

[1] Include information concerning facilities at all sites where program courses are delivered.

B. Computing Resources

Describe any computing resources (workstations, servers, storage, networks including software) in addition to those described in the laboratories in Part A, which are used by the students in the program. Include a discussion of the accessibility of university-wide computing resources available to all students via various locations such as student housing, library, student union, off-campus, etc. State the hours the various computing facilities are open to students. Assess the adequacy of these facilities to support the scholarly and professional activities of the students and faculty in the program.

There are approximately 2,400 computers on campus of which approximately 1,200 are available for student use related to instruction and another 325 are in use by full-time faculty.

There are nearly 80 computer labs, mobile computer carts, and classrooms with instructor stations with access to audio/visual resources on campus. There are 9 labs and 5 classrooms dedicated to the Engineering Technology program. Engineering Technology students may also use any of the publicly accessible labs and work stations that are located throughout the Library and in the Student Center.

Network access, as well as access to the open internet, is provided campus-wide. Every office, classroom, lab, and residence hall room are fully networked. Free, fast, reliable, and secure wireless internet connectivity is available from anywhere on campus.

C. Guidance

Describe how students in the program are provided appropriate guidance regarding the use of the tools, equipment, computing resources, and laboratories.

The Mechanical Engineering Technology program requires students to observe and use the equipment found in the various laboratories. All of the laboratory equipment is first demonstrated by the course instructor. Students are also provided copies of equipment manuals for review and reference. In general, students are not required to operate equipment without the course instructor being present. All software that the students are required to use is introduced to the students through in-class assignments.

D. Maintenance and Upgrading of Facilities

Describe the policies and procedures for maintaining and upgrading the tools, equipment, computing resources, and laboratories used by students and faculty in the program.

The College of Science and Technology receives an appropriation each year to provide instruction (i.e., faculty and adjunct pay), purchase and repair existing equipment, and support faculty development. In addition, there is an appropriation based on the number of students enrolling in classes and paying lab fees. These lab fees can be used to support instruction, purchase and repair existing equipment, or support faculty development. Overall, the funding is constrained in the College. However, the College has used its funding efficiently, and has been able to purchase and repair existing equipment on a yearly basis. Every four to five years the College has a major expense in the purchase of new computers.

The Dean of the College attempts to stagger these purchases and roll out new hardware on a planned basis so as not to use all of the resources in one year.

All programs of study have a budget that is allocated at the beginning of the year. These funds can be used to hire teaching assistants, purchase and repair equipment, support student clubs and extra-curricular activities, and for purchasing expendable supplies. Major repairs are paid for by the Dean's budget so as not to adversely impact program budgets. Faculty maintain complete autonomy over the use of their budgets provided they are within state guidelines. Should a program of study run short of funding due to unforeseen circumstances, their budget may be offset by the College of Science and Technology.

E. Library Services

Describe and evaluate the capability of the library (or libraries) to serve the program including the adequacy of the library's technical collection relative to the needs of the program and the faculty, the adequacy of the process by which faculty may request the library to order books or subscriptions, the library's systems for locating and obtaining electronic information, and any other library services relevant to the needs of the program.

Fairmont State University has two libraries that may be used by all students, faculty and staff members. The Ruth Ann Musick Library is located on the main campus, and the Aerospace Library is located at the National Aerospace Education Center (NAEC) in Bridgeport. These libraries actively support the academic programs of the University. Library personnel (currently 15 staff members) work closely with faculty and students to develop research skills and to provide a wide range of support services that are designed to enhance the learning experience. The print and electronic resources support most of the curricular needs of the Occupational Safety program while encouraging intellectual and personal growth.

The Fairmont State University Libraries provide access to over 500,000 books in both print and electronic format, as well as print periodicals, government documents, compact discs, videos, and other multimedia, and to nearly 100 electronic databases. Subscriptions to more than 28,000 unique journals and newspapers, available in either print or online full text, provide the latest information for all disciplines.

The libraries hold over 23,000 print and electronic books, over 500 academic journals, and over 400,000 full text articles relating specifically to engineering and/or engineering technology. All print materials are classified according to the Library of Congress classification system and online resources are accessible via the library website, 24/7

The libraries hold over 700 print and electronic books, over 64 academic journals, and over 36,000 full text articles relating specifically to occupational safety. All print materials are classified according to the Library of Congress classification system and online resources are accessible via the library website, 24/7.

F. Overall Comments on Facilities

Describe how the program ensures the facilities, tools, and equipment used in the program are safe for their intended purposes. (See the 2019-2020 APPM section I.E.5.b.(1).)

The facilities in the College of Science and Technology are maintained well. Equipment that is in disrepair is not used if it is deemed unsafe. The equipment is either repaired or taken out of service. The College does have three laboratory technicians that help to assure that our facilities and equipment are up-to-date and in working order. One technician is assigned to the Technology Department in the Engineering Technology Building, and two are assigned to Hunt Haught Hall (i.e., one in Chemistry and one in Biology and Geoscience). The Physical Plant on campus maintains all of the buildings on campus, and the majority of costs associated with upkeep and repair do not come from College budgets. The same is also true for maintaining our technological infrastructure. However, the College is charged for the repair or updating of all instructional technology devices used in classrooms and laboratories. Over the past five years, this has been a priority (i.e., updating existing teaching technology, investing in SMART Classrooms, and providing adequate computer hardware and software for faculty and students) in the College of Science and Technology.

CRITERION 8. INSTITUTIONAL SUPPORT

A. Leadership

Describe the leadership of the program and discuss its adequacy to ensure the quality and continuity of the program and how the leadership is involved in decisions that affect the program.

The Mechanical Engineering Technology program is directed by a Program Coordinator who reports directly to the Chair of the Department of Technology who is under the Dean of the College of Science and Technology. The Program Coordinator is instrumental in curriculum revisions, program changes, course development, and all other aspects of the day-to-day operations of the program. Since there are three full-time faculty members in the program (one being the coordinator), any decisions on matters that affect the program are usually made jointly. Excluding general studies requirements, and degree hour limitations, the coordinator has complete control of academic issues. However, consults with the faculty, IAC, and Dean prior to changes to the curriculum. This ensures meeting the needs of the constituencies as well as working within the framework of the university.

B. Program Budget and Financial Support

1. Describe the process used to establish the program's budget and provide evidence of continuity of institutional support for the program. Include the sources of financial support including both permanent (recurring) and temporary (one-time) funds.

   The Dean of the College organized the budgets using historical data (i.e., FTE's, student enrollments, amount of expendable supplies used, etc.). Using the data as a baseline, each program area is provided with a set budget, and faculty were provided complete autonomy over how that budget could be spent. As previously noted the College of Science and Technology receives an appropriation each year to provide instruction (i.e., faculty and adjunct pay), purchase and repair existing equipment, and support faculty development. In addition, there is an appropriation based on the number of students enrolling in classes and paying lab fees. These lab fees can be used to support instruction, purchase and repair existing equipment, or support faculty development.

   The current process used to allocate budgets to program areas appears to be working. However, adjustments are needed every couple of years to reflect student growth or special needs in any particular program. For example, one of the current programs of study in the College has a very low number of students. The budget for this particular program will be reduced to better serve the existing programs of study. At various times a program may expend all of their funding due to unforeseen circumstances. The College has been very fortunate in that it has always been able to meet these expenditures without detriment to students or the program of study.

2. Describe how teaching is supported by the institution in terms of graders, teaching assistants, teaching workshops, etc.

The institution supports faculty in teaching by providing numerous professional development experiences during an academic year. As a teaching institution (and not a Research I Institution), Fairmont State University values teaching above all other criteria. The institution provides hardware and software to assist faculty in the teaching of their courses. This consists of Blackboard as a component for delivery of content, at minimum, for syllabus and course grades. In addition to Blackboard, FSU is also using clicker technology for the purpose of quick assessment and engagement of student learning. Classrooms are equipped with Sympodia. Software that is supported through instructional technology includes Respondus, StudyMate Server, Camtasia, SafeAssign, Wimba Classroom, Wimba Voice Tools, and the Lockdown Browser.

Strategies undertaken to ensure success in the use of Instructional Technology:

- The Teaching and Learning Commons was established to merge services of the Help Desk with Blackboard services and other technology-related needs. The Teaching and Learning Commons was re-located to the Library where expanded hours are available. The wireless network has been expanded to all parts of the campus.
- Computer labs have been updated and will continue on a three-year replacement cycle. FSU is also in the process of implementing an intra-net so that some documents and information will not be available to the public, but so students will receive information they need for their classes and majors.
- Student mobile technologies, i.e. Smartphones and laptop computers, have been integrated into courses for enhanced electronic delivery. Students have Smartphone access to an e-web site for ease of information transfer and can also get their Blackboard courses via their smart phones.
- Fairmont State is in the process of implementing cloud computing so that students might have access to any software they need anywhere on campus. This may be accessed in a regular computer lab, by their laptop through the wireless network, by any other device such as an I Pad that they might bring to campus, or by their Smartphone.
- The College of Science and Technology had also received a Title III Grant from the Department of Education to support student retention, increase graduation rates, provide peer mentors, and to purchase new technology in increase student learning and development. The grant has been completed.

3. To the extent not described above, describe how resources are provided to acquire, maintain, and upgrade the infrastructures, facilities, and equipment used in the program.

The Physical Plant on campus maintains all of the buildings on campus, and the majority of costs associated with upkeep and repair do not come from College budgets. The same is also true for maintaining our technological infrastructure. However, the College is charged for the repair or updating of all instructional technology devices used

in classrooms and laboratories. Over the past five years, this has been a priority (i.e., updating existing teaching technology, investing in SMART Classrooms, and providing adequate computer hardware and software for faculty and students) in the College of Science and Technology.

The Dean of every College or School is able to submit financial plans and needs to the Budget Committee. In the annual budget planning process, one first identifies the mission or strategic plan agenda to be funded and the accompanying rationale. Second, the resources required for accomplishing that mission or plan must be determined and may include additional personnel (i.e. wages and benefit costs) or operating expense dollars for activities such as the purchase of supplies, equipment, or allocation for travel expenses. Budget resources may come from adjustments to tuition and fees, state appropriations, enrollment, and / or a reallocation of existing resources. Lastly, after the mission or plan is established and institutional resources have been allocated for its achievement, it is important that there is some measure of the success of the activities toward the targeted goals. Again, the College has been fortunate to receive funding to support student academic success in meeting program and course outcomes, equipment, and professional development of faculty and staff.

4. Assess the adequacy of the resources described in this section with respect to the students in the program being able to attain the student outcomes.

As with any organizations, increased funding that is budgeted well could result in improved educational efforts. However, the allocation and use of funds in the program provides for adequate emphasis and work toward student outcomes. With the upgrades in facilities, and equipment over the last ten years, students have been exposed to industry-quality experiences. This addresses the outcomes of developing technical competencies, communication skills, and professional awareness. In addition to the state funding, this program works to develop relationships with industry as a way to give the students the opportunity of field experiences through site tours and internships.

C. Staffing

Describe the adequacy of the staff (administrative, instructional, and technical) and institutional services provided to the program. Discuss methods used to retain and train staff.

The University has allowed the College to fill necessary positions based on the existing budget available to the College. There is an adequate number of support staff, and faculty for the College to be successful. The university is currently undergoing a re-alignment of all colleges and programs. The new model, although not finalized as of this SSR, should provide the program with adequate staff.

Fairmont State University regularly provides professional development activities for faculty, staff, and administrators on campus. These professional development activities occur on a regular basis, and some of them call for required attendance. All faculty and staff

in the College have the ability to utilize professional development funds to meet their own educational needs.

Mentorship is key to training new faculty or staff. In the College of Science and Technology each new staff or faculty member is assigned a peer mentor for the first year. This mentor meets regularly with the new staff or faculty member to assist in their career development and to help answer questions related to their job roles, teaching, or service.

D. Faculty Hiring and Retention

1. Describe the process for hiring of new faculty.
2. Describe strategies used to retain current qualified faculty.

In the hiring process of new faculty, the Dean of the College will gain approval for the position from the Provost, President, Office of Finance, and Human Resources. A position description is written with the assistance of faculty from that particular program of study. The position is then advertised in local and regional newspapers and in the Chronicle of Higher Education. Prior to releasing the candidates for review by the department, Human Resources will vet the pool of candidates to assure for diversity among the candidates.

Candidates are then screened by the faculty of the department. This is usually done with telephone or Skype interviews. The top 3-4 candidates are then requested to come to campus and present a 'teaching lesson' to the faculty of the department. Recommendations are then made to the Dean and Provost of the University. In this process, faculty take the lead role in recommending hires. All successful candidates must pass a criminal history background check prior to being hired.

The College uses a mentorship strategy to help retain qualified faculty. At Fairmont State University it usually can take 6 years to receive tenure. The process used by the College is to review faculty each year (i.e., teaching, scholarship, and service) to help keep the candidate on track. During the first year of employment, new faculty does not serve as advisors in a program of study.

E. Support of Faculty Professional Development

Describe the adequacy of support for faculty professional development, how such activities such as sabbaticals, travel, workshops, seminars, etc., are planned and supported.

As previously noted the College of Science and Technology provides professional development funds to support faculty and staff. No one has been turned down for the use of these funds in the past 6 years. Faculty can apply for sabbaticals, travel, workshops, and seminars on a regular basis. Sabbaticals are granted pending funding from existing budgets. Anyone holding faculty rank is eligible for sabbatical leave after the completion of at least six years of full-time employment at Fairmont State University. The award of sabbatical leave is not automatic, but depends on the merits of the request and on conditions prevailing at the University at the time. After completing a sabbatical leave, the individual will not again be eligible until the seventh subsequent year.

Sabbatical leave may be granted for the purpose of research, writing, study, or other activity designed to improve teaching and usefulness to the University. Applicants for sabbatical leave will initiate the procedure by obtaining application forms from their Deans. Applications will include: 1) personal professional data; 2) a typewritten proposal detailing the activity to be pursued; and 3) relevant supporting documents. Completed application forms will be submitted by applicants to their Deans on or before December 1 for a sabbatical leave to begin the fall or spring semester of the following academic year.

PROGRAM CRITERIA

Describe how the program satisfies any applicable program criteria. If already covered elsewhere in the self-study report, provide appropriate references.

[NOTE: It can be useful to list the program criteria requirements and then include a description or reference for how the program satisfies each of those requirements. The applicable program criteria could include statements that add specificity to the requirements for student outcomes found in Criterion 3. These statements differentiate the discipline designated by the program's title and should be included in the mapping to the program's student outcomes. The applicable program criteria could also include statements that add specificity to the curricular requirements found in Criterion 5 to differentiate the discipline implied by the title of the program criteria. These should be included in the program's required coursework.]

This section can consist of the listing of required topics and indicating which courses contain that content. The program should expect to provide examples of student work in each topic area to validate that the students are doing work related to each topic.

Lead Society: American Society of Mechanical Engineers

These program criteria apply to engineering technology programs that include mechanical or similar modifiers in their titles. An accreditable program in mechanical engineering technology prepares graduates with knowledge, problem-solving ability and hands-on skills to enter careers in the design, installation, manufacturing, testing, technical sales, maintenance, and other endeavors typically associated with mechanical components and systems. Programs emphasize how things actually work, how they are made, and the realization that most mechanical components and assemblies become parts of complex systems, an important consideration realized at the beginning of the design process. Level and scope of career preparation will depend on the degree level and specific program orientation.

PROGRAM CRITERIA FOR BACCALAUREATE LEVEL PROGRAMS

Curriculum

The curriculum must prepare associate degree graduates with the knowledge, techniques, skills, and use of modern equipment in mechanical engineering technology. Graduates must have strengths in specifying, installing, building, testing, documenting, operating, selling or maintaining basic mechanical systems. Programs prepare graduates for entry into industry as engineering technicians or for transfer to a baccalaureate degree program as appropriate to support the program educational objectives. The following curricular topics are required (unless the program's faculty and primary constituents approve the substitution of other specific,

mechanically-related technical subjects supporting attainment of program educational objectives):utilization of principles, hardware, and software that are appropriate to produce drawings, reports, quantity estimates, and other documents related to mechanical engineering;

a. Application of principles of geometric dimensioning and tolerancing

   In the TECH 1108: Engineering Graphics I and TECH 2208: Engineering Graphics II students are introduces to geometric dimensioning and toleranceing. The students are then required to apply these principles in case study design projects in MECH 2240: Machine Design.

b. Use of computer aided drafting and design software

   In the TECH 1108: Engineering Graphics I and TECH 2208: Engineering Graphics II students are introduces to computer aided drafting and design using AutoCAD and SolidWorks.

c. Selection, set-up, and calibration of measurement tools/instrumentation

   The MECH 2200: Strength of Materials course has a laboratory component that requires student to perform laboratories related to material properties and strength.

d. Preparation of laboratory reports and systems documentation associated with development, installation, or maintenance of mechanical components and systems

   The MECH 2200: Strength of Materials and MECH 2220: Fluid Mechanics courses have a laboratory component that requires student to perform laboratories and write reports that explain their methods, results and conclusions.

e. Basic familiarity and use of industry codes, specifications, and standards

   The MECH 2200: Strength of Materials course utilizes the AISC code for the design of structural steel members. The MECH 2240: Machine Design course covers ASME code for shaft calculations and the NSPE code of ethics.

f. Use of basic engineering mechanics

   The following courses are required in the mechanical engineering technology program: MECH 1100: Statics, and MECH 2200: Strength of Materials.

g. An integrating or capstone experience utilizing skills acquired in the program.

The Mechanical Engineering Technology program's MECH 2240 Machine Design course addresses ABET's program specific capstone experience. This course requires a fundamental understanding of statics, strength of materials, thermodynamics and fluid mechanic. An understanding of basic statics and strength of materials is required to understanding three dimensional analyses of structures and combined stresses. Competences in thermodynamics are required to understand work and energy that is required in mechanical device. There are also fluid mechanics fundamentals required in hydraulic systems. The course includes homework, exams, and case studies that combine these topics. The case studies are small projects that required drafting, design, analysis, and selection of mechanical systems.

APPENDICES

APPENDIX A – COURSE SYLLABI

Please use the following format for the course syllabi (2 pages maximum in Times New Roman 12 point font)

1. Course number and name
2. Credits and contact hours
3. Instructor's or course coordinator's name
4. Text book, title, author, and year
    a. other supplemental materials
5. Specific course information
    a. brief description of the content of the course (catalog description)
    b. prerequisites or co-requisites
    c. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program
6. Specific goals for the course
    a. specific outcomes of instruction, ex. The student will be able to explain the significance of current research about a particular topic.
    b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.
7. Brief list of topics to be covered

1) COURSE NAME: **STATICS**
COURSE NUMBER: **MECH 1100**

2) Lecture Information: 3 credit hours
Location: 305 Engineering Technology Building
Meeting day(s): Tuesday - Thursday
Meeting time(s): 1:30-2:45 PM

3) Instructor Name: Hugh Costello
Email: hcostello@fairmontstate.edu
Office location: 403 ET Building
Office hours: As posted
Phone: (304) 367-4821
Fax: (304) 367-4934

4) Required Textbook(s):

1. **Cheng, Statics and Strength of Materials, 2nd edition,** McGraw Hill, 1997.
    a. ISBN: 0-02-803067-2

Optional References:

1. National Council of Examiners for Engineering and Surveying**,** FE Reference Handbook-revised, 2008.
    a. www.ncees.org
    b. ISBN 978-1-932613-37-7
    c. Suggested retail price: free

Other Tools/Supplies: FE specified scientific calculator, Straight edge, Engineering Paper

Software: Word, Excel, internet capability

5) Course description: The Study of force systems that act on rigid bodies in ststic equilibrium. Topics of study include the analysis of coplanar and non-coplanar force systems using analytical and graphical methods.

Course Pre-requisite(s): MATH 1102, or 1115, or CR: MATH 1102

Course Co-requisite(s): MATH 1102

Delivery Method: MECH 1100 is a required course for the Mechanical ET program. The course will be delivered via traditional face-to-face lecture and will be enhanced/managed on-line utilizing Blackboard. Students will be required to access the course enhancement tools to obtain the course syllabus, assignments, and grades for the course.

6) Course outcomes: At the end of this course, students will be able to:

1. Understand basic engineering mechanics principals
2. Determine the resultant of several concurrent forces, both in plane and in space.
3. Determine the moment of a force.
4. Determine the resultant of a non-concurrent force system
5. Determine the force necessary for static equilibrium of a rigid body subjected to a number of known forces.
6. Calculate internal forces in members of simple structures (trusses).
7. Calculate the reactions for simple frame structures.
8. Determine the location of the centroids of common plane areas and composite areas.
9. Evaluate basic problems involving dry friction.

7) Topics covered:

1. Fundamental Concepts and Principles and Math Review
2. Resultant of Coplanar Force Systems
3. Equilibrium of Coplanar Force Systems
4. Analysis of Structures
5. Dry Friction
6. Center of Gravity and Centroids
   Area Moments of Inertia

1) COURSE NAME: **STRENGTH OF MATERIALS**
COURSE NUMBER: **MECH 2200**

2) Lecture Information: 3 credit hours
Location: 210 Engineering Technology Building
Meeting day(s): Monday and Wednesday
Meeting time(s): 11:00 AM to 12:15 PM

3) Instructor Name: Hugh Costello
Email: hcostello@fairmontstate.edu
Office location: 403 ET Building
Office hours: As posted
Phone: (304) 367-4821
Fax: (304) 367-4934

4) Required Textbook(s):

2. **Cheng, Statics and Strength of Materials, 2nd edition,** McGraw Hill, 1997.
    a. ISBN: 0-02-803067-2

Optional References:

2. National Council of Examiners for Engineering and Surveying**,** FE Reference Handbook-revised, 2008.
    a. www.ncees.org
    b. ISBN 978-1-932613-37-7
    c. Suggested retail price: free

Other Tools/Supplies: FE specified scientific calculator, Straight edge, Engineering Paper

Software: Word, Excel, internet capability

5) Course description: The analysis of stress and deformation of deformable bodies under the action of forces. Students will examine the design and selection of tension and compression members, shafts and beams, stress and strain, Hook's Law, mechanical properties of engineering materials, torsion, bending and buckling theory.

Course Pre-requisite(s): MATH 1102, or 1115, or CR: MATH 1102

Course Co-requisite(s): MATH 1102

Delivery Method: MECH 2200 is a required course for the Mechanical ET program. The course will be delivered via traditional face-to-face lecture and will be enhanced/managed on-line utilizing Blackboard. Students will be required to access the course enhancement tools to obtain the course syllabus, assignments, and grades for the course.

6) Course outcomes: At the end of this course, students will be able to:

1. Demonstrate an appropriate mastery of the knowledge, techniques, skills and modern tools of their disciplines,
2. Demonstrate an ability to conduct, analyze and interpret experiments and apply experimental results to improve processes,
3. Apply creativity in the design of systems, components or processes appropriate to program objectives including working on teams and communicating effectively
4. Prepare for the ability to engage in lifelong learning, a commitment to quality, timeliness, and continuous improvement
5. Demonstrate an awareness of professional, ethical and social responsibilities, including a respect for diversity and knowledge of contemporary professional, societal and global issues.
6. Demonstrate technical expertise in manufacturing processes, mechanical design, and computer-aided engineering graphics with added technical depth in at least one of these areas.
7. Demonstrate technical expertise in engineering materials, statics, dynamics, strength of materials, fluid mechanics, thermodynamics, and electrical power.
9. conducting standardized field and laboratory testing on civil engineering materials
10. Determine forces and stresses in elementary structural systems;

7) Topics covered:

1. Moment of Inertia and Statics Review
2. Simple Stresses
3. Linear, Thermal and Shear Strain
4. Equilibrium of Coplanar Force Systems
5. Torsion of Circular Shafts
6. Shear Forces and Bending Moments in Beams
7. Stresses in Beams
8. Design of Beams for Strength
9. Deflections of Beams
10. Statically Indeterminate Beams
11. Combined Stresses
12. Columns

1) COURSE NAME: **THERMODYNAMICS I**
COURSE NUMBER: **MECH 2210**

2) Lecture Information: 3 credit hours
Location: 303 Engineering Technology Building
Meeting day(s): Tuesday - Thursday
Meeting time(s): 9:30-10:45 AM

3) Instructor Name: Jason Bolyard
Email: jbolyard@fairmontstate.edu
Office location: 407 ET Building
Office hours: As posted
Phone: (304) 367-4849
Fax: (304) 367-4934

4) Required Textbook(s):

3. **Cengel and Boles, Thermodynamics: An Engineering Approach, 7th edition,** McGraw Hill, 2011.

    a. ISBN-13: 978-0-07-736674-2

Optional References:

b. N/A

Other Tools/Supplies: FE specified scientific calculator

Software: Word, Excel, internet capability

5) Course description: An Introduction to the thermodynamic laws of conservation of mass and energy. Students will explore applications in the analysis of energy sources, transformations and utilizations.

Course Pre-requisite(s): MECH 1100 with a C or better

Course Co-requisite(s): None

Delivery Method: MECH 2210 is a required course for the Mechanical ET program. The course will be delivered via traditional face-to-face lecture and will be enhanced/managed on-line utilizing Blackboard. Students will be required to access the course enhancement tools to obtain the course syllabus, assignments, and grades for the course.

6) Course outcomes: At the end of this course, students will be able to:

1. Demonstrate an understanding of the First Law of Thermodynamics
2. Successfully perform calculations using pure substance property diagrams and tables.
3. Successfully apply the first law of thermodynamics to closed system problems.
4. Successfully apply the first law of thermodynamics to open system problems.
5. Demonstrate an understanding of the Second Law of Thermodynamics

7) Topics covered:

1. Introduction and Basic Concepts
2. Energy, Energy Transfer, and General Energy
3. Properties of Pure Substances
4. Energy Analysis of Closed Systems
5. Mass and energy Analysis of Control Volumes
6. The Second Law of Thermodynamics

1) COURSE NAME: **FLUID MECHANICS**
COURSE NUMBER: **MECH 2220**

2) Lecture Information: 3 credit hours
Location: 113 Engineering Technology Building
Meeting day(s): Monday - Wednesday
Meeting time(s): 12:00-12:30 PM

3) Instructor Name: Jason Bolyard
Email: jbolyard@fairmontstate.edu
Office location: 407 ET Building
Office hours: As posted
Phone: (304) 367-4849
Fax: (304) 367-4934

4) Required Textbook(s):

c. **Mott, Robert L., Applied Fluid Mechanics,** 6th edition, Pearson Prentice Hall Publishing, 2006.
d. ISBN-13: 978-0-13-114680-8

Optional References:

None

Other Tools/Supplies: FE specified scientific calculator

Software: Word, Excel, internet capability

5) Course description: A study ot the mechanics of fluid systems. Topics include fluid statics and dynamics, dimensional analysis and similitude, steady flow of incompressible fluids in pipes, ducts, and open channels, steady flow of compressible fluids over surfaces and about immersed bodies and turbomachinery.

Course Pre-requisite(s): MECH 2200, TECH 2290

Course Co-requisite(s): None

Delivery Method: MECH 2220 is a required course for the Mechanical ET program. The course will be delivered via traditional face-to-face lecture and will be enhanced/managed on-line utilizing Blackboard. Students will be required to access the course enhancement tools to obtain the course syllabus, assignments, and grades for the course.

6) Course outcomes: At the end of this course, students will be able to:

1. Demonstrate an ability to understand, calculate, and utilize fluid properties.
2. Demonstrate an ability to calculate forces due to static fluids.
3. Demonstrate an ability to understand and calculate forces associated with buoyancy
4. Demonstrate an understanding of the behavior and calculations involved with a flowing fluid.
5. Demonstrate an understanding of laminar and turbulent flow.
6. Demonstrate an understanding of piping systems and pump selection.

7) Topics covered:

1. The Nature of Fluids and the study of fluid mechanics
2. Viscosity of Fluids
3. Pressure Measurement
4. Forces Due to Static Fluids
5. Buoyancy and Stability
6. Flow of Fluids and Bernoulli's Equation
7. General Energy Equation
8. Piping Systems and Pump Selection

1) COURSE NAME: **MACHINE DESIGN**
COURSE NUMBER: **MECH 2240**

2) Lecture Information: 3 credit hours
Location: 432 Engineering Technology Building
Meeting day(s): Monday, Wednesday, and Friday
Meeting time(s): 9:00 to 9:50 AM

3) Instructor Name: Hugh Costello
Email: hcostello@fairmontstate.edu
Office location: 403 ET Building
Office hours: As posted
Phone: (304) 367-4821
Fax: (304) 367-4934

4) Required Textbook(s):

4. **Norton, Machine Design, 4th edition,** Prentice Hall, 2011.

    a. ISBN: 0-13-148190-8

Optional References:

d. None

Other Tools/Supplies: Calculator – TI-86 or equivalent

Software: Word, Excel, internet capability

5) Course description: Application of the principles of mechanics to the design and selestoin of machine components. Topics of study include beams, columns, shafts, gears, bearings, belts, brakes, and springs. Design projects will be assigned and computer solutions will be utilized.

Course Pre-requisite(s): MECH 2200, COMP 1101, TECH 2290 or MATH 1185 or MATH 1190

Course Co-requisite(s): None

Delivery Method: MECH 2240 is a required course for the Mechanical ET program. The course will be delivered via traditional face-to-face lecture and will be enhanced/managed on-line utilizing Blackboard. Students will be required to access the course enhancement tools to obtain the course syllabus, assignments, and grades for the course.

6) Course outcomes: At the end of this course, students will be able to:

1. Demonstrate an appropriate mastery of the knowledge, techniques, skills and modern tools of their disciplines
2. Demonstrate an ability to identify, analyze and solve technical problems,
3. Demonstrate an ability to apply creativity in the design of systems, components or processes appropriate to program objectives,
4. Demonstrate a commitment to quality, timeliness, and continuous improvement.
5. Demonstrate an ability to understand professional, ethical and social responsibilities.
6. Demonstrate technical expertise in manufacturing processes, mechanical design, and computer-aided engineering graphics with added technical depth in at least one of these areas.
7. Demonstrate expertise in applied physics having an emphasis in applied mechanics and added technical topics in physics appropriate to the program objectives.
8. Demonstrate technical expertise having added technical depth in computer-aided engineering graphics, vibrations, and electro-mechanical devices.

7) Topics covered:

1. Introduction to Design
2. Material Properties
3. Three Dimensional Analysis
4. Mohr's Circle
5. Failure Analysis
6. Fatigue Failure
7. Surface Failure
8. Shafts and Couplings
9. Bearings
10. Gears
11. Fasteners
12. Springs
13. Clutches and Brakes
14. Hydraulic System

1) COURSE NAME: **THERMODYNAMICS II**
COURSE NUMBER: **MECH 3300**

2) Lecture Information: 3 credit hours
Location: 303 Engineering Technology Building
Meeting day(s): Tuesday and Thursday
Meeting time(s): 9:30-10:45 AM

3) Instructor Name: Jason Bolyard
Email: jbolyard@fairmontstate.edu
Office location: 407 ET Building
Office hours: As posted
Phone: (304) 367-4849
Fax: (304) 367-4934

4) Required Textbook(s):

b. **Cengel and Boles, Thermodynamics: An Engineering Approach**, 7th edition, McGraw Hill, 2011.
c. ISBN-13: 978-0-07-352932-5

Optional References:

None

Other Tools/Supplies: FE specified scientific calculator

Software: Word, Excel, internet capability

5) Course description:

A continuation of the study of thermodynamics, with special emphasis on equations of state, calorimetry, processes, heat engines and the Second Law of Thermodynamics. Topics include PVT relationships of pure substances, caloric equations of state, properties of multi-phase substances, processes of compressible and incompressible gases, liquids, solids, and multi-phase substances, the Carnot heat engine, entropy, refrigeration and heat pump cycle, the Third Law of Thermodynamics and the analysis of Carnot cycles.

Course Pre-requisite(s): MECH 2210

Course Co-requisite(s): None

Delivery Method: MECH 3300 is a required course for the Mechanical ET program. The course will be delivered via traditional face-to-face lecture and will be enhanced/managed on-line utilizing Blackboard. Students will be required to access the course enhancement tools to obtain the course syllabus, assignments, and grades for the course.

6) Course outcomes: At the end of this course, students will be able to:

1. Successfully apply the first law of thermodynamics to closed system problems.
2. Successfully apply the first law of thermodynamics to steady-state open system problems.
3. Demonstrate an understanding of the Second Law of Thermodynamics
4. Successfully apply entropy to thermodynamics problems.

7) Topics covered:

1. Energy Analysis of Closed Systems
2. Mass and energy Analysis of Control Volumes
3. The Second Law of Thermodynamics
4. Entropy

1) COURSE NAME: **DYNAMICS**
COURSE NUMBER: **MECH 3320**

2) Lecture Information: 3 credit hours
Location: 305 Engineering Technology Building
Meeting day(s): Monday, Wednesday, and Friday
Meeting time(s): 9:00 to 9:50 AM

3) Instructor Name: Hugh Costello
Email: hcostello@fairmontstate.edu
Office location: 403 ET Building
Office hours: As posted
Phone: (304) 367-4821
Fax: (304) 367-4934

4) Required Textbook(s):

1. **Beer, Ferdinand P. and Johnston, E. Russell, Mechanics for Engineers, Dynamics,** 5th edition, McGraw Hill Publishing, 2008
   ISBN: 978-0-07-246477-1

Optional References:

e. None

Other Tools/Supplies: FE specified scientific calculator

Software: Word, Excel, internet capability

5) Course description: This course covers the study of Newtonian dynamics of particles and rigid bodies in plane motion. Topics include Kinematics, Newton's Laws and energy principles, and impulse momentum

Course Pre-requisite(s): MECH 1100 and TECH 3300 or MATH 1186 or MATH 3315

Course Co-requisite(s): None

Delivery Method: MECH 3320 is a required course for the Mechanical ET program. The course will be delivered via traditional face-to-face lecture and will be enhanced/managed on-line utilizing Blackboard. Students will be required to access the course enhancement tools to obtain the course syllabus, assignments, and grades for the course.

6) Course outcomes: At the end of this course, students will be able to:

1. Demonstrate an understanding of particle kinematics
2. Demonstrate an understanding of Newton's second law of motion
3. Demonstrate an ability to solve particle kinetics problems using work and energy
4. Demonstrate an understanding of impulse and momentum
5. Demonstrate an understanding of the kinematics and kinetics of rigid bodies
6. Demonstrate and understanding of basic dampened and nondampened vibrations.

7) Topics covered:

1. Kinematics of Particles
2. Kinetics of Particles: Work and Energy
3. Kinetics of Particles: Impulse and Momentum
4. Kinematics of Rigid Bodies
5. Kinetics of Rigid Bodies: Work and Energy
6. Kinetics of Rigid Bodies: Impulse and Momentum

1) COURSE NAME: **HEAT TRANSFER I**
COURSE NUMBER: **MECH 3330**

2) Lecture Information: 3 credit hours
Location: 313 Engineering Technology Building
Meeting day(s): Tuesday - Thursday
Meeting time(s): 11:00-12:15 AM

3) Instructor Name: Jason Bolyard
Email: jbolyard@fairmontstate.edu
Office location: 407 ET Building
Office hours: As posted
Phone: (304) 367-4849
Fax: (304) 367-4934

4) Required Textbook(s):

5. **Cengel, Y. A., Heat and Mass Transfer, 4rd edition,** McGraw Hill, 2011.

    a. ISBN-13: 978-0-07-736664-3

Optional References:

b. N/A

Other Tools/Supplies: FE specified scientific calculator

Software: Word, Excel, internet capability

5) Course description: A study of heat energy interactions in solids, liquids, and gases. Topics include fundamental laws of conduction, convection and radiation heat transfer. Baccalaureate majors only.

Course Pre-requisite(s): PHYS 1102, TECH 3300 or MATH 1186 or MATH 3315

Course Co-requisite(s): None

Delivery Method: MECH 3330 is a required course for the Mechanical ET program. The course will be delivered via traditional face-to-face lecture and will be enhanced/managed on-line utilizing Blackboard. Students will be required to access the course enhancement tools to obtain the course syllabus, assignments, and grades for the course.

6) Course outcomes: At the end of this course, students will be able to:

1. Demonstrate an ability to solve basic conduction heat transfer problems
2. Demonstrate an ability to solve basic convection heat transfer problems
3. Demonstrate an ability to solve basic radiation heat transfer problems

7) Topics covered:

1. Introduction and Basic Concepts
2. Steady Heat Conduction
3. External Forced Convection
4. Internal Forced Convection
5. Fundamentals of Thermal Radiation
6. Radiation Heat Transfer

1) COURSE NAME: **HEATING, AIR CONDITIONING AND VENTILATION**
COURSE NUMBER: **MECH 3340**

2) Lecture Information: 3 credit hours

Location: 206 Engineering Technology Building
Meeting day(s): Tuesday and Thursday
Meeting time(s): 11:00-12:45 PM

3) Instructor Name: Jason Bolyard

Email: jbolyard@fairmontstate.edu
Office location: 407 ET Building
Office hours: As posted
Phone: (304) 367-4849
Fax: (304) 367-4934

4) Required Textbook(s):

c. **Howell, R. H., Sauer, H.S. Jr., Coad, W.J., Principles of Heating Ventilating and Air Conditioning,** ASHRAE, Inc. 2005.
d. ISBN: 193-1-86-2923

Optional References:

Cengel and Boles, Thermodynamics: An Engineering Approach, 6th edition, McGraw Hill, 2008. ISBN-13: 9780073305370

Other Tools/Supplies: FE specified scientific calculator

Software: Word, Excel, internet capability

5) Course description:

A study of the principles of fluid mechanics, thermodynamics and heat transfer as applied to HVAC systems. Topics include: heating and cooling load calculations, heating, air conditioning and refrigeration systems; automatic controls; heat pumps for heating and cooling; solar heating and cooling systems.

Course Pre-requisite(s): MECH 3300

Course Co-requisite(s): None

Delivery Method: MECH 3340 is a required course for the Mechanical ET program. The course will be delivered via traditional face-to-face lecture and will be enhanced/managed on-line utilizing Blackboard. Students will be required to access the course enhancement tools to obtain the course syllabus, assignments, and grades for the course.

6) Course outcomes: At the end of this course, students will be able to:

1. Demonstrate an ability to apply thermodynamic, heat transfer, and fluid mechanics principles to HVAC systems
2. Demonstrate an ability to perform load calculations
3. Demonstrate an ability to design duct and pipe systems
4. Demonstrate an ability to understand different HVAC system configurations
5. Demonstrate an ability to select HVAC equipment
6. Demonstrate an ability to evaluate HVAC system costs

7) Topics covered:

1. Gas –Vapor mixtures and Air Conditioning
2. Basic HVAC Systems Calculations
3. Residential Load Calculations
4. Nonresidential Load Calculations
5. Duct and Pipe Sizing
6. Air-Conditioning System Concepts
7. System Configurations

1) COURSE NAME: **MECHANICAL MEASUREMENTS**
COURSE NUMBER: **MECH 4400**

2) Lecture Information: 3 credit hours
Location: 432 Engineering Technology Building
Meeting day(s): Monday - Wednesday
Meeting time(s): 10:00-11:50 AM

3) Instructor Name: Jason Bolyard
Email: jbolyard@fairmontstate.edu
Office location: 407 ET Building
Office hours: As posted
Phone: (304) 367-4849
Fax: (304) 367-4934

4) Required Textbook(s):

6. **Beckwith, Marangoni, and Lienhard, Mechanical Measurements, 6th edition,** Pearson, 2007.

   a. ISBN-13: 978-0-20-184765-9

Optional References:

   b. N/A

Other Tools/Supplies: FE specified scientific calculator

Software: Word, Excel, internet capability

5) Course description: A study of the measurement of motion, force, torque and power with emphasis on strain measurement and strain gage techniques with instrumentation. Topic include error analysis, and curve fitting.

Course Pre-requisite(s): MECH 3320

Course Co-requisite(s): None

Delivery Method: MECH 4400 is a required course for the Mechanical ET program. The course will be delivered via traditional face-to-face lecture and will be enhanced/managed on-line utilizing Blackboard. Students will be required to access the course enhancement tools to obtain the course syllabus, assignments, and grades for the course.

6) Course outcomes: At the end of this course, students will be able to:

1. Demonstrate an ability to collect, present, and interpret experimental data.
2. Successfully apply appropriate theories to obtain results from experimental data.
3. Demonstrate an ability to present, interpret and identify trends in experimental results.
4. Demonstrate an understanding of the sensors and data acquisition systems used in mechanical measurements

7) Topics covered:

1. The Process of Measurement
2. Assessing and Presenting Experimental Data
3. Measurement of Count, Events, Time Interval, and Frequency
4. Strain and Stress: Measurement and Analysis
5. Measurement of Force and Torque
6. Measurement of Fluid Flow
7. Temperature Measurement
8. Design and Analysis of Experiments
9. Computer Simulations

1) COURSE NAME: **THERMODYNAMICS III**
COURSE NUMBER: **MECH 4410**

2) Lecture Information: 3 credit hours
Location: 210 Engineering Technology Building
Meeting day(s): Tuesday - Thursday
Meeting time(s): 8:00-9:15 AM

3) Instructor Name: Jason Bolyard
Email: jbolyard@fairmontstate.edu
Office location: 407 ET Building
Office hours: As posted
Phone: (304) 367-4849
Fax: (304) 367-4934

4) Required Textbook(s):

7. **Cengel and Boles, Thermodynamics: An Engineering Approach, 7th edition,** McGraw Hill, 2011.

    a. ISBN-13: 978-0-07-736674-2

Optional References:

b. N/A

Other Tools/Supplies: FE specified scientific calculator

Software: Word, Excel, internet capability

5) Course description: A continuation of the study of thermodynamics, with special emphasis upon application to heat, power and refrigeration systm. Topic include energy availability and irreversibility in open and closed thermodynamic systems, mixtures of gases and vapors, reactive systems, internal and external combustion power cycles, reversed cycles and flow through nozzles and diffusers.

Course Pre-requisite(s): MECH 3300, MECH 3330

Course Co-requisite(s): None

Delivery Method: MECH 4410 is a required course for the Mechanical ET program. The course will be delivered via traditional face-to-face lecture and will be enhanced/managed on-line utilizing Blackboard. Students will be required to access the course enhancement tools to obtain the course syllabus, assignments, and grades for the course.

6) Course outcomes: At the end of this course, students will be able to:

1. Demonstrate an understanding of the Second Law of Thermodynamics
2. Successfully apply the Second Law of Thermodynamics.
3. Analyze thermodynamic power cycles.
4. Analyze and design refrigeration and heat pump systems.
5. Demonstrate an understanding of the fundamentals of combustion.

7) Topics covered:

1. The Second Law of Thermodynamics
2. Entropy
3. Exergy
4. Gas Power Cycles
5. Vapor and Combined Power Cycles
6. Refrigeration Cycles
7. Chemical Reactions

1) COURSE NAME: **HEAT TRANSFER II**
COURSE NUMBER: **MECH 4430**

2) Lecture Information: 3 credit hours
Location: 210 Engineering Technology Building
Meeting day(s): Tuesday and Thursday
Meeting time(s): 8:00-9:15 AM

3) Instructor Name: Jason Bolyard
Email: jbolyard@fairmontstate.edu
Office location: 407 ET Building
Office hours: As posted
Phone: (304) 367-4849
Fax: (304) 367-4934

4) Required Textbook(s):

c. **Cengel, Y. A., Heat and Mass Transfer,** 4th edition, McGraw Hill, 2011.
d. ISBN-13: 978-0-07-736664-3

Optional References:

None

Other Tools/Supplies: FE specified scientific calculator

Software: Word, Excel, internet capability

5) Course description:

A continuing study of conduction, convection, and radiation heat transfer, with emphasis on application to residential, commercial and industrial and heat exchanger design. Topics include steady-stated transient heat conductions, free and forced heat convection, condensing and boiling heat transfer, radiation, transfer by combined mechanisms, numerical and analog methods.

Course Pre-requisite(s): MECH 3330

Course Co-requisite(s): None

Delivery Method: MECH 4430 is a required course for the Mechanical ET program. The course will be delivered via traditional face-to-face lecture and will be enhanced/managed on-line utilizing Blackboard. Students will be required to access the course enhancement tools to obtain the course syllabus, assignments, and grades for the course.

6) Course outcomes: At the end of this course, students will be able to:

1. Demonstrate an ability to solve natural and forced convection heat transfer problems
2. Demonstrate an understand of heat exchanger analysis and design
3. Demonstrate an understanding of the heat transfer associated with boiling and condensation
4. Demonstrate an ability to solve basic radiation heat transfer problems
5. Demonstrate an ability to solve transient and multi-dimensional conduction heat transfer problems

7) Topics covered:

1. Internal Forced Convection
2. Natural Convection
3. Boiling and Condensation
4. Heat Exchangers
5. Fundamentals of Thermal Radiation
6. Transient Heat Conduction
7. Numerical Methods in Heat Conduction
8. Computer Applications in Heat Transfer

APPENDIX B – FACULTY VITAE

Please use the following format for the faculty vitae (2 pages maximum in Times New Roman 12 point type)

1. Name
2. Education – degree, discipline, institution, year
3. Academic experience – institution, rank, title (chair, coordinator, etc. if appropriate), when (ex. 1990-1995), full time or part time
4. Non-academic experience – company or entity, title, brief description of position, when (ex. 1993-1999), full time or part time
5. Certifications or professional registrations
6. Current membership in professional organizations
7. Honors and awards
8. Service activities (within and outside of the institution)
9. Briefly list the most important publications and presentations from the past five years – title, co-authors if any, where published and/or presented, date of publication or presentation
9. Briefly list the most recent professional development activities

1. Jason D. Bolyard, PE

2. **Education:**

   Master of Science, Mechanical Engineering, West Virginia University, 2005
   Bachelor of Science, Civil Engineering Technology, Fairmont State University, 2003

3. **Academic experience:**

   Fairmont State University, Assistant Professor, Coordinator of Mechanical Engineering Technology, Full Time, 2009-Present
   Fairmont State University, Temporary Assistant Professor, Civil Engineering Technology, Full Time, 2007-2009
   Fairmont State University, Adjunct Professor, Civil Engineering Technology, Part Time, 2006-2007

4. **Non-academic experience:**

   Beitzel Corporation, Engineer, Generated digital terrain models, Full Time, 2005-2007

5. **Certifications or professional registrations:**

   Registered Professional Engineer (PE) in WV

6. **Current membership in professional organizations:**
   None

7. **Honors and awards:**
   None

8. **Service activities:** (within and outside of the institution)
   None

9. **Briefly list the most important publications and presentations from the past five years – title, co-authors if any, where published and/or presented, date of publication or presentation**

PhD Proposal, Analysis of Light Duty Diesel Emissions Test Procedures, presented and approved April 2019

10. **Briefly list the most recent professional development activities**

    30 hours biannually for registered profession engineer continuing education
    PhD course work, Advanced Calculus (3hr), Fall 2018

1. Hugh M. Costello, PE

2. Education:

Master of Science, Mechanical Engineering, Massachusetts institute of Technology, 1985

Bachelor of Science, Mechanical Engineering, West Virginia University, 1982

3. Academic Experience:

Fairmont State University, Chair of Engineering Technology, Full Time, 2014-Present

Fairmont State University, Assistant Professor, Mechanical Engineering Technology, Full Time, 2009-Present

4. Non-Academic Experience:

Mighty Mech LLC, Sole Proprietor, design for manufacture, 3D CAD, Rapid prototyping, and project engineering, Part Time, 2008-Present

WVHTC Foundation, Senior Engineer, Lead design engineer for Robotics Development Group, Full Time, 2006-2008

General Electric Aircraft Engines, Lead Design Engineer, lead design engineer for externals of the CF34-10A commercial flight engine, Full Time, 2000-2006

Livingston & Haven, Sales Engineer, Developed, implemented, and engineered industrial automation, hydraulic, pneumatic, and lubrication systems for industrial customers, Full Time, 1995-2000

Scientific Ecology Group, Project Engineer, design a tele-operated remote lubrication device for hot cell equipment, Full Time, 1986-1994

Shanklin Corp., Design Engineer, Design of commercial shrink-wrapping equipment, Full Time, 1985-1986

5. Certifications or Professional Registrations:

Registered Professional Engineer in the State of West Virginia

Six Sigma Greenbelt Certified

6. Current membership in professional organizations:

Member of the American Society of Mechanical Engineers (ASME)

7. Honors and Awards:

US Patent with GE Aircraft

TSPE Outstanding Engineering Achievement

8. Service Activities: (within and outside of the institution)
Vacation Bible School

Church Lecturer

Knights of Columbus

9. Briefly list the most important publications and presentations from the past five years – title, co-authors if any, where published and/or presented, date of publication or presentation

FE Exam Review (Math, Strength of Materials, Dynamics) Presentation

10. Briefly list the most recent professional development activities

30 hours biannually for registered professional engineer continuing education

Prepared FE review workshop lectures

1. **James E. Vassil, PE**

2. **Education:**
   - Master of Science, Civil Engineering, New Jersey Institute of Technology, 2001
   - Bachelor of Science, Civil Engineering Technology, Fairmont State University, 1999

3. **Academic experience:**
   - Fairmont State University, Assistant Professor, Coordinator of Civil Engineering Technology, Full Time, 2006-Present
   - Fairmont State University, Visiting Assistant Professor, Civil Engineering Technology, Full Time, 2001-2006

4. **Non-academic experience:**
   - Owner/operator JNK Construction and Engineering 2011-Present
   - Commercial roofing/siding , 1991-2001

5. **Certifications or professional registrations:**
   - Professional Engineer License, 2010

6. **Current membership in professional organizations:**
   - WV Contractors Association
   - American Society of Engineering Educators

7. **Honors and awards:**
   - None

8. **Service activities: (within and outside of the institution)**
   - Marion County Park Commission

9. **Briefly list the most important publications and presentations from the past five years – title, co-authors if any, where published and/or presented, date of publication or presentation.**
   - West Virginia Department of Transportation Survey Conference Presentation: Surveying Math, 16 hours
     - Done annually with different topics and concepts each year.

10. **Briefly list the most recent professional development activities.**
    - ABET Continuous Improvement Workshop, October 2018
    - ABET Symposium, April 2019
    - Attended WVDOT Surveying Conference
    - Prepared FE review workshop lectures

APPENDIX C – EQUIPMENT

Please list the major pieces of equipment used by the program in support of instruction.

Classroom Instructional Resources

All Mechanical engineering technology classes are held in the engineering technology building and are equipped with whiteboards, projectors and network access. The computer lab located in room 113 of the engineering technology building has software specific to the major and has 30 computers. There are additional computer labs across campus equipped with course specific software.

The Mechanical engineering technology program has various equipment that satisfy to needs of the courses. Table C-1 bellow lists the necessary equipment used across the courses offered at FSU's MET program.

Course	Equipment	Related Outcome (1-5)
MECH 2200	MTS QTest 100 Universal Tester, TQ SM1001 Torsion Tester, TQ STR4 Beam tester, Excel	1,2,3,4
MECH 2220	Armfield Hydraulic Bench, Armfield F1-12: Hydrostatic Pressure, Armfield F1-15: Bernoulli's Apparatus	1,2,3,4,5

APPENDIX D – INSTITUTIONAL SUMMARY

Programs are requested to provide the following information.

1. The Institution

a. Name and address of the institution.

Fairmont State University
1201 Locust Ave, Fairmont, WV 26554

b. Name and title of the chief executive officer of the institution.

Dr. Mirta Martin – President

b. Name and title of the person submitting the Self-Study Report.

James Vassil, PE. Program Coordinator, Civil Engineering Technology

c. Name the organizations by which the institution is now accredited, and the dates of the initial and most recent accreditation evaluations.

Fairmont State University is accredited by The Higher Learning Commission and is a member of the North Central Association, 230 S. LaSalle Street, Suite 7-500, Chicago, IL 60604-1411, (800) 621-7440x105, http://www.ncahlc.org.

The Teacher Education program is approved by the West Virginia Board of Education and accredited by the National council for the Accreditation of Teacher Education/Council for the Accreditation of Educator Preparation, 2100 Massachusetts Ave., Suite 500, Washington, DC 20036,(202) 223-0077. In addition, selected teaching specializations are nationally approved by their respective learned society and/or professional organization. The most recent accreditation visit by the higher learning commission occurred in the summer of 2018.

Selected programs in the College of Science and Technology are accredited by the Engineering Technology Accreditation Commission and Applied Natural Sciences Accreditation Commission of ABET, 111 Market Place, Suite 1050, Baltimore, MD 21202-4012, (410) 347-7700. The following programs are currently accredited by ETAC of ABET: A.S. and B.S. Civil, A.S. and B.S. Electronics, and A.S. and B.S. Mechanical Engineering Technology. In addition, the B.S. Occupational Safety program is accredited by ANSAC of ABET. The Engineering Technology programs have been accredited by ABET since 1988. The most recent accreditation visit was October 2013.

The A.S. Nursing program is accredited by the West Virginia Board of Examiners for Registered Professional Nurses, 90 MacCorkle Avenue, SW, Suite 203, South Charleston, WV 25303, (304) 744-0900, Fax: (304) 744-0600,

http://wwww.rnboard@wv.gov and the Accreditation Commission for Education in Nursing (ACEN), 3343 Peachtree Road NE, Suite 850, Atlanta, GA, 30326, (404)975-5000, http://acenursing.org; the B.S. Nursing program is accredited by the Commission on Collegiate Nursing Education (CCNE), One Dupont Circle, NW Suite 530, Washington, DC, 20036, (202) 887-8476, http://www.aacn.nche.edu.

The School of Business is accredited by the Accreditation Council for Business Schools and Programs (ACBSP) 11520 West 119th Street, Overland Park, KS 66213, (913) 339-9356, www.acbsp.org.

The University is also a member of the American Association of Colleges for Teacher Education, National League for Nursing, American Library Association, and Public Relations Society of America (PRSA) West Virginia Chapter.

2. Type of Control

Description of the type of managerial control of the institution, e.g., private-non-profit, private-other, denominational, state, federal, public-other, etc.

Fairmont State University is a state institution governed by the state legislature and with oversight by the WV Higher Education Policy Commission. According to Chancellor, Paul Hill, PhD, "The West Virginia Higher Education Policy Commission is responsible for developing, establishing, and overseeing the implementation of a public policy agenda for the state's four-year colleges and universities. It is charged with oversight of higher education institutions to ensure they are accomplishing their missions and implementing the provisions set by state statute".

3. Educational Unit

Describe the educational unit in which the program is located including the administrative chain of responsibility from the individual responsible for the program to the chief executive officer of the institution. Include names and titles. An organization chart may be included.

Administrative Structure

The following positions and descriptions of duties represent the top-down hierarchy of the institution. The management of the academic program begins with oversight by the Board of Governors but is managed by the program coordinator and faculty.

Board of Governors

As noted on the Board of Governors' website (http://www.fairmontstate.edu/aboutfsu/board-governors) , the BOG "determines, controls, supervises and manages the financial, business and education policies and affairs" of Fairmont State University. (§18B-2A-4(a)) Its membership, terms of office, responsibilities, powers and electoral procedures are further governed by West Virginia Code, Chapter 18B. The twelve-member board meets bi-monthly on campus. Meetings are open to the public and anyone with an interest in the governance of the university is welcome to attend. Various

campus reports are routinely sent to the Board of Governors. The Board of Governors may also make specific requests for data from the campus. These requests are routed through the President's Office, and from there they are routed to the appropriate office for response. All requested information is collected, and the campus response is then issued by the President's Office.

The President

The President is the chief executive officer on the campus and oversees the operation of the campus, including the academic, financial, student services, and external communication programs in consultation with the vice presidents of each of these areas. The President also serves as the campus representative to the West Virginia Legislature, the WVHEPC, and to the region the campus serves. The President is responsible to the Board of Governors.

Provost /Vice President for Academic Affairs

The Office of the Vice President for Academic Affairs (Provost) maintains the integrity of FSU's academic mission by overseeing academic programs, policies, procedures, calendars, academic appointments, promotion and tenure, and faculty grants and fellowships. Positions that report to Academic Affairs include academic Deans, the Director of the Honors Program, the Coordinator of the Advising Center, and the Director of the Center for Civic Engagement.

Associate Provost/Vice President for Academic Affairs

This administrator assists in the conduct of the academic functions of the University. When necessary, the Associate Provost assumes responsibility for academic matters in the absence of the Provost and Vice President for Academic Affairs.

College/School Deans, Associate Deans, and Department Chairs

The Dean is charged with implementing academic policies. They have authority to supervise the academic functions of faculty members within their academic units.

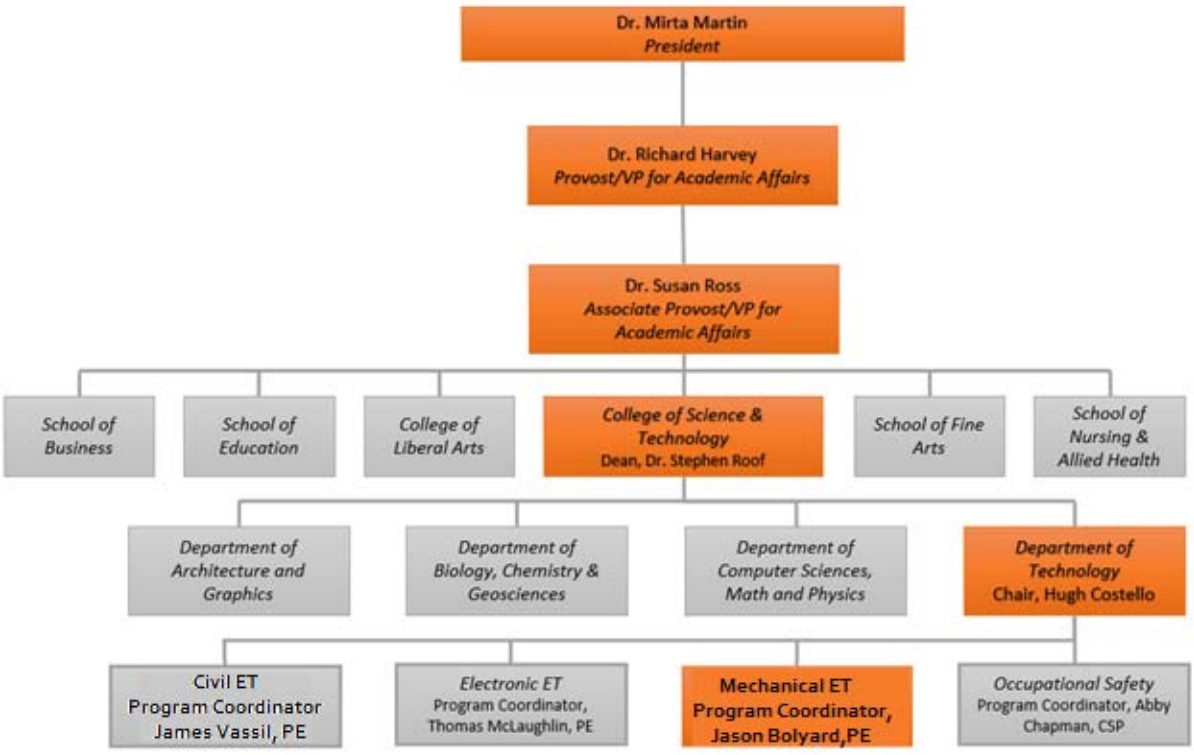
Program Coordinator

The coordinator is charged with assisting College/School Dean with academic functions including;

- Developing curriculum revisions
- Maintaining specialized accreditation
- Securing adjunct faculty
- Generating five-year program review reports
- Directing program faculty
- Reviewing academic transfers
- Contact person for all program matters

Program Faculty

Faculty members are responsible for the development and delivery of materials within the constraints of the established program objectives and outcomes. Faculty members are also responsible for assessment of course outcomes to ensure students are meeting program outcomes and objectives.



4. Academic Support Units

List the names and titles of the individuals responsible for each of the units that teach courses required by the program being evaluated, e.g., mathematics, physics, etc.

Chemistry/Biology:	Dr. Stephen Roof, Interim Dean
English:	Dr. Deanna Shields, Dean
Fine Arts:	Dr. Francine Kirk, Interim Dean
Math/Computer Science/Physics:	Dr. Stephen Roof, Interim Dean
Social Sciences:	Dr. Deanna Shields, Dean
Technology:	Dr. Stephen Roof, Interim Dean

5. Non-academic Support Units

List the names and titles of the individuals responsible for each of the units that provide non-academic support to the program being evaluated, e.g., library, computing facilities, placement, tutoring, etc.

Non-academic Unit	Director
Academic Advising	Jennifer Jones
Career Services	Ashley Tasker
Computing Services	Jonnie Raisovich
Housing	Alicia Kalka
Library	Sharon Mazure
Student Life	Alicia Kalka
Tutoring	James Mathews

6. Credit Unit

It is assumed that one semester or quarter credit normally represents one class hour or three laboratory hours per week. One academic year normally represents at least 28 weeks of classes, exclusive of final examinations. If other standards are used for this program, the differences should be indicated.

The university operates on a 16-week semester for fall and spring providing 32 weeks of instruction and examination during one fiscal year. At Fairmont State University, one credit hour is awarded for each class hour. Laboratory hours, in general, are two contact hours for one credit hour.

7. Tables

Complete the following tables for the program undergoing evaluation.

Table D-1. Program Enrollment and Degree Data

Mechanical Engineering Technology

	Academic Year		Enrollment Year					Total Undergrad	Total Grad	Degrees Awarded			
			1st	2nd	3rd	4th	5th			Associates	Bachelors	Masters	Doctorates
Current Year	2018	FT	30	17	23	36	2	108	0	3	17		
		PT	0	0	0	0	0						
1	2017	FT	31	25	29	47	0	132	0	2	40		
		PT	0	0	0	0	0						
2	2016	FT	44	35	22	33	1	135	0	3	19		
		PT	0	0	0	0	0						
3	2015	FT	42	15	25	30	0	112	0	1	17		
		PT	0	0	0	0	0						
4	2014	FT	40	21	20	31	1	113	0	5	19		
		PT	0	0	0	0	0						

Give official fall term enrollment figures (head count) for the current and preceding four academic years and undergraduate and graduate degrees conferred during each of those years. The "current" year means the academic year preceding the on-site visit.

FT--full time
PT--part time

Table D-2. Personnel

Associate of Science Mechanical Engineering Technology
Year: 2018

	HEAD COUNT		FTE[2]
	FT	PT	
Administrative[2]	0	1	
Faculty (tenure-track)[3]	2	0	
Other Faculty (excluding student Assistants)	2	0	
Student Teaching Assistants[4]	0	0	
Technicians/Specialists	1	0	
Office/Clerical Employees	0	0	
Others[5]	0	0	

Report data for the program being evaluated.

1. Data on this table should be for the fall term immediately preceding the visit. Updated tables for the fall term when the ABET team is visiting are to be prepared and presented to the team when they arrive.

2. Persons holding joint administrative/faculty positions or other combined assignments should be allocated to each category according to the fraction of the appointment assigned to that category.

3. For faculty members, 1 FTE equals what your institution defines as a full-time load.

4. For student teaching assistants, 1 FTE equals 20 hours per week of work (or service). For undergraduate and graduate students, 1 FTE equals 15 semester credit-hours (or 24 quarter credit-hours) per term of institutional course work, meaning all courses — science, humanities and social sciences, etc.

5. Specify any other category considered appropriate, or leave blank.

SUBMISSION ATTESTING TO COMPLIANCE

Only the Dean or Dean's Delegate can electronically submit the Self-study Report.

ABET considers the on-line submission as equivalent to that of an electronic signature of compliance attesting to the fact that the program conducted an honest assessment of compliance and has provided a complete and accurate disclosure of timely information regarding compliance with ABET's *Criteria for Accrediting Engineering Programs* to include the General Criteria and any applicable Program Criteria, and the ABET *Accreditation Policy and Procedure Manual.*