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

BACKGROUND INFORMATION

A. Contact Information – Primary Pre-Visit Contract

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B. Program History

The Mechanical Engineering Technology (MET) program was implemented in 1984 and was located within the Automotive Engineering Technology Department**.** The program offered both Associate of Applied Science (AAS) and Bachelor of Science (BS) degrees. The AAS degree consisted of the first two years of the BS degree such that students could continue on with no loss of credit which is still the case. The BS degree program was first accredited by ABET in 1988 and has been continuously accredited since that time. In 1992, the program was moved to the newly created Manufacturing and Mechanical Engineering Technology Department which became the Engineering Technology Department in 2011. In 2018, it was moved into the Department of Mechanical Engineering.

C. Options

The MET degree does not currently have any options of emphases.

D. Program Delivery Modes

All MET classes have been traditionally delivered face-to-face and offered during the day. Some courses utilize web-enhanced material where students can access files, assignments, grades, and participate in student-instructor interactions online. These courses are referred to as web-enhanced courses. Several innovative teaching formats were added due to Covid-19 in the spring of 2020. Here is a list of the formats used during the 2020/21 academic year:

- Face- to- face (FTF) – regular meeting times are scheduled in classrooms
- Hybrid (HYB) – 20%-33% of the content is online, and the remaining content is FTF

- Flex (FLEX) – a combination of face to face and online where students in the same class meet on different days or times to allow for required social distancing (COVID)
- Virtual (VTL) – the class meets virtually at regularly scheduled times and days with no FTF
- Virtual Hybrid (VTLHYB) – class meets on specific days and times virtually, but some course content (20%-33%) is provided online in a synchronous fashion.
- Online (ONL) – the course is totally online with asynchronous content

E. Program Locations

Courses in the program are offered at the main campus at the following location:

Weber State University
3750 Harrison Blvd.
Ogden, Utah 84408

The MET office is located in Room 214 of the Engineering Technology (ET) Building at the main Ogden campus.

F. Public Disclosure

Provide Program Educational Objectives (PEOs), Student Outcomes (SOs), annual student enrollment, and graduation data are accessible to the public at:
https://www.weber.edu/me/met.html

Program information can be found at:
https://catalog.weber.edu/preview_program.php?catoid=17&poid=8089

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

Findings from the previous ABET Review and actions the Department has taken in response are summarized below.

ABET Finding – Program Concern – Criterion 2

Criteria 2 – Program Educational Objectives states, "The program must have published program educational objectives (PEOs) that are consistent with the mission of the institution, the needs of the program's various constituencies, and these criteria. There must be a documented, systematically utilized, and effective process, involving program constituencies, for the periodic review of these program educational objectives… ."

The ABET team found that while the MET Program has presented PEOs to some constituencies, it does involve all program constituents and does not review PEOs regularly. The committee is concerned that irregular review of PEOs that does not include all constituents may cause the PEOs to lose strength and relevance to the constituents.

ABET requires evidence, through documented meeting minutes involving all program constituents, that the program has periodically reviewed its PEOs.

Program Actions Taken in Response to Criterion 2 Concern

The Department now conducts an annual meeting with the Industrial Advisory Committee (IAC) to survey members on student outcomes and assess Program Educational Objectives (PEOs). After meeting with the IAC, the department faculty review the PEOs and discuss whether any changes are necessary. This last meeting with the IAC was held on 3 June (virtually due to COVID-19). New PEOs were proposed, reviewed, and accepted by all members of the IAC. Meeting minutes can be found in Appendix E.

ABET Finding – Program Concern – Accreditation Policies and Procedures

Policy and Procedure II.A.6 states, "Institution catalogs and similar publications must clearly indicate the programs accredited by the commissions of ABET as separate and distinct from other programs of kinds of accreditation. Each accredited program must be specifically identified as "accredited by the _____ Accreditation Commission of ABET." The ABET committee found that the accreditation body is incorrectly identified as TAC on pages 12 and 115 of the 2015-2016 catalog, and as Accreditation Board for Engineering and Technology in the brochure for the MET program. This improper identification of the accrediting body may cause negative impact to the program.

The ABET committee requires that the program correctly identify the accrediting body in all official documents.

Program Actions Taken in Response Accreditation Policies and Procedures Concern

This error was corrected during the last ABET visit in 2015. The current program website correctly lists that the program is accredited by the Engineering Technology Accreditation Commission of ABET.

https://www.weber.edu/me/met.html

PROGRAM CRITERIA

The program criteria for Mechanical Engineering Technology state that "the curriculum must prepare baccalaureate degree graduates with the knowledge, techniques, skills, and use of modern equipment in mechanical engineering technology." The Mechanical Engineering Technology program at Weber State University achieves these requirements by ensuring that all necessary curricular topics are covered, that the capstone experience is project-based and includes formal design, implementation, and test processes, and by ensuring that faculty members maintain currency in their specialty areas.

Curricular Topics

The program criteria for Mechanical Engineering Technology states that the following curricular topics are required:

a. Application of principles of geometric dimensioning and tolerancing;
b. Use of computer-aided drafting and design software;
c. Perform selection, set-up, and calibration of measurement tools/instrumentation;
d. Elements of differential and integral calculus;
e. Manufacturing processes;
f. Material science and selection;
g. Solid mechanics (such as statics, dynamics, strength of materials, etc.);
h. Mechanical system design;
i. Thermal sciences (such as thermodynamics, fluid mechanics, heat transfer, etc.);
j. Electrical circuits (ac and dc) and electronic controls;
k. Application of industry codes, specifications, and standards; and
l. Technical communications typically used in preparation of engineering proposals, reports, and specifications.

Table 9-1 identifies the courses in which each of these topics are covered.

Capstone Experience

The capstone experience provided by the MET program (MET 4500 and MET 4510) is a project-based course sequence. The sequence requires the students to practice formal design, implementation, and test processes. These details can be seen in more detail in the course syllabi found in Appendix A and in the student work for the Senior Project courses.

Faculty Members

The faculty in the MET program are encouraged to remain current in their specialty areas. Scholarship activities (including professional training, participation in technical communities, and research) are required for tenure. The faculty vitae (CVs) provided in Appendix B illustrate the efforts of individual faculty to remain current in their areas.

Table 5-1 Courses Covering Required Curricular Topics

Mechanical Engineering Technology

	Required Curricular Topic											
Course	**a**	**b**	**c**	**d**	**e**	**f**	**g**	**h**	**i**	**j**	**k**	**l**
MET 1000 Introduction to Mech. Engineering Technology												
PDD 1010 Introduction to Engineering & Technical Design	X	X										
MET 1500 Mechanical Design Engineering						X	X	X	X			X
MATH 1210 Calculus I				X								
MFET 2360 Manufacturing Processes & Materials					X	X						
MET 2500 Modern Engineering Technologies							X					
MFET 2300 Statics & Strength of Materials						X	X					
EET 1850 Industrial Electronics										X		
MET 3050 Dynamics							X					
MET 3300 Computer Programming Applications of MET				X								
MET 3400 Machine Design	X						X	X				
MET 3150 Engineering Technology Materials			X								X	
MET 3500 Mechanical Measurements & Instrumentation			X							X		X
MET 4200 Mechanical Design with FEA		X					X	X				
MFET 1210 Machining Principles	X				X						X	
MET 3700 Testing & Failure Analysis			X					X			X	X
MET 4500 Senior Project I								X				X
MET 4510 Senior Project II								X				X
MFET 3340 & 3340L Applied Fluid Power/Lab									X			
MET 4650 Thermal Science				X					X			
MET 4990 Seminar in Mechanical Engineering Technology												X

GENERAL CRITERIA

CRITERION 1. STUDENTS

A. Student Admissions

Weber State University (WSU) is an open-enrollment institution, and the Mechanical Engineering Technology (MET) program has no specific requirements for admission. After admission, a student's math placement is determined from a placement rubric based on high school GPA and either their ACT or SAT score. Students with less than the minimum rubric criterion must complete a prescribed developmental math course. Students with less than a 17 on the ACT in both English and Reading must complete the appropriate developmental English course. Students with at least 17 on the English and Reading and a 23 on the mathematics sections of the ACT (or SAT equivalents) are allowed to take non-developmental freshman math and English courses.

Students without the necessary score for the placement rubric (HS GPA and ACT or SAT score) must take Accuplacer tests to determine which developmental courses they will need to start with. These students are also required to complete the required developmental English or mathematics courses before they complete 60 credit hours. Students are not allowed to enroll in upper-division courses until they have completed the required developmental courses with a grade of C or above.

New students are encouraged to meet with the MET Program Coordinator, an assigned faculty member who is given three credit hours of reassigned time per semester for serving in this position. The Program Coordinator makes extensive use of Cattracks, a WSU computer-based degree evaluation and planning tool which enables tracking the student's progress toward graduation by showing courses taken, grades received, courses required, grade point average, transfer credits, and other pertinent information.

B. Evaluating Student Performance

University policy states, "Students must earn a cumulative GPA of at least 2.00 for all WSU work. No more than 20 credit hours of "D" grade may be applied toward graduation. A college or department may reject any or all "D" grade work toward major or minor requirements." The program requires a "C" or better in both the required courses and the technical support courses for the major. Seniors may petition to have one C- allowed in major and support courses. Approval from the Program Coordinator and Department Chair is required for the single C- allowed. Grades are assigned using the University grading scale. In the case of a course where a prerequisite has not been met, the faculty member teaching the course may elect to admit the student or deny admission to the class. If they choose to, the student can appeal to the department, and the department makes the final decision about whether the student must take the prerequisite or can take another course in lieu of the prerequisite.

C. Transfer Students and Transfer Courses

In compliance with the Higher Education Act, Weber State University only accepts transfer credit from regionally accredited colleges and universities. Students transferring to WSU with an Associate of Arts or an Associate of Science degree earned at any institution within the Utah System of Higher Education (USHE) will be considered as having met the WSU general education requirements. Students transferring from a college or university within the USHE, after having met that institution's general education requirements but not having received a degree and upon certification of the registrar at that institution, will be considered as having satisfied the WSU general education requirements.

Upon acceptance to the University, transfer students are required to provide official transcripts that are initially evaluated by the admissions office. There are standard general education course numbers for math, science, and English courses across all USHE schools in the state. Articulation agreements are available for all of the accredited schools within the state for other courses. For consistency purposes, the Program Coordinator handles all transfer student evaluations regarding program requirements. Any substitutions or acceptance of transfer credit is noted on the student advising sheets.

The Mechanical Engineering Technology program also accepts certain courses for transfer credit from the Utah College of Applied Technology, where those courses have been evaluated and have been deemed equivalent to courses at WSU. The program also accepts certain high school courses for credit, again where courses have been evaluated and deemed equivalent to courses at WSU through the state-wide Concurrent Enrollment program. Both of these articulation agreements are reviewed annually to make certain that they are current.

D. Advising and Career Guidance

Advising

Each faculty is required to maintain a minimum of five office hours per week for student consultation and advising. Students are required to meet with their advisor once a year to ensure they are on track towards graduation. Advising sheets for each student in the major are maintained in a central department file for reference and tracking. The College also has an advisor that is available to students to answer questions on General Education requirements.

The University has an Office of Career Services, and a representative from that office is assigned full-time to the College. This person is available for one-on-one consultation with students and is also available to visit classes to talk about resume writing and senior files. Job opportunities are posted on a website entitled CareerConnect. Students are also notified about job postings through email.

Students in need of advisement or career guidance also have access to the MET Program Coordinator. Three additional advisors from the Dean's office are also available to help in this process. The Program Coordinator's advisement concerning general education is augmented by advisors in the WSU Student Success Center and the college advisors in the Dean's office. Students are required to meet with the Program Coordinator annually. Cursory advising (supplying students with informational brochures, directing students to faculty, scheduling advising appointments, etc.) may be performed by the department's administrative assistant.

Career Guidance

A staff member in the Dean's office serves as a career advisor for all departments in the College. The duties of this staff member are to provide career counseling to students, forward employment opportunities to students for full-time and part-time work and internships, help the WSU Career Services Department conduct job fairs and interviews on campus, and promote WSU students and graduates to local companies.

E. Work in Lieu of Courses

The Mechanical Engineering Technology Department has policies in place that govern credit for life experiences and exams that apply to the MET program. These two policies are outlined in the following paragraphs.

To get credit for life experience, students petitioning for experiential credit must fill out the experiential credit form available online at:

https://www.weber.edu/wsuimages/chfam/chfadvise/Experiential%20Credit%20Application.pdf

This form is also available in hard copy form at the Engineering Technology Office. The student must indicate which class or classes for which they wish to receive experiential credit. Students must present the form to the faculty responsible for teaching the classes in question along with appropriate documentation that illustrates the students' mastery of the material in the class.

1. It is the student's responsibility to present the appropriate faculty member with documentation that will enable the faculty member to assess whether or not the experiential work is equivalent to the class in question. Documentation may include work training documentation or actual work artifacts. Faculty may also interview the student to determine whether or not the student has sufficient background in the area to justify giving experiential credit.

2. The responsible faculty member will document their decision to approve experiential credit in Cattracks with an appropriate comment. The Department Chair may evaluate 1000 level courses; all other courses must be evaluated by a faculty member who has

taught or currently teaches the courses.

3. Approval sequence; once the responsible faculty has signed the form, the student will present the form for approval to the Department Chair. Once the Department Chair has signed the form, the student will take the form to the WSU Cashiers Office and pay the requisite fee. The Cashiers Office will provide a Payment Validation Stamp. After paying the fee, students will return the form to the MET Office, where the office administrator will complete the form with a Department Stamp and submit the form to the registrar's office. All other conditions and policies are listed on the form.

Credit by special examination may be awarded at the discretion of academic departments according to the following guidelines:

1. Academic departments will provide an annual list of courses that may be challenged.

2. The department chair or designee may interview the candidate and determine whether or not the student has sufficient background in the area to justify giving a special examination.

3. The faculty member sends the examination results to the records office, where the credit is posted to the student's permanent record.

4. The credit that can be earned (overall and in each sitting) will be determined by each department.

5. A student may not take examinations in more than one subject area at any one sitting.

6. A student may take an examination for any given course(s) one time only.

7. A fee will be charged for each sitting.

Credit for dual enrollment courses (courses taken in high school for university credit) is handled through the university's Concurrent Enrollment Office. This office works directly with the academic departments to determine which high school courses will be allowed for university credit. These courses are reviewed annually by the department to make certain they should continue to receive this credit.

F. Graduation Requirements

To graduate with a Bachelor of Science degree in Mechanical Engineering Technology, students must meet the following requirements:

- Complete the requirements for the AAS degree in Mechanical Engineering Technology.

- A grade of "C" or better in all major courses, support courses, and technical electives is required (a grade of "C-" is not acceptable) in addition to an overall GPA for all courses

of 2.00 or higher. Also, refer to the general grade requirements for graduation in the Degree and General Education Requirements section of the WSU catalog.

- A total of 124-126 credit hours (depending on which math option is chosen) are required for graduation. A total of 40 upper-division credit hours is required (courses numbered 3000 and above.) A minimum of 30 hours in residency (WSU courses) is required.

Students have the responsibility to apply for graduation (no fee is charged for applying for graduation). Program Coordinators and Academic Advisors have access to a Graduation Roster online that can identify unmet requirements for students that have applied for graduation so issues can be resolved in a timely manner. Once all requirements are met in the online systems, the student is cleared for graduation.

G. Transcripts of Recent Graduates

Transcripts of recent graduates will be submitted to the visiting team upon request. Detailed explanations of the transcripts will be provided at that time.

CRITERION 2. PROGRAM EDUCATIONAL OBJECTIVES

A. Mission Statement

The mission statement of Weber State University:

Weber State University provides associate, baccalaureate, and master degree programs in liberal arts, sciences, technical and professional fields. Encouraging freedom of expression and valuing diversity, the university provides excellent educational experiences for students through extensive personal contact among faculty, staff, and students in and out of the classroom. Through academic programs, research, artistic expression, public service, and community-based learning, the university serves as an educational, cultural, and economic leader for the region.

Listed below are the three core themes of the mission and the objectives of each.

1. Learning

a. Students experience an engaging learning environment founded on extensive personal contact among faculty, staff, and students in and out of the classroom.
b. Students receive effective educational support.
c. Students learn to succeed as educated persons and professionals.
d. Students and faculty learn, explore and create in an environment that sustains free inquiry and free expression.

2. Access

a. Weber State University offers responsive associate, baccalaureate, and master's degrees in liberal arts, sciences, technical and professional fields.
b. Students will progress appropriately in their programs of study.
c. Weber State University provides access to higher education opportunities.

3. Community

a. Weber State University contributes to pre-K through 12 education in the region.
b. Weber State University contributes to the richness of the regional culture.
c. Weber State University contributes to the economic development of the region.

B. Program Educational Objectives

The Program Educational Objectives (PEOs) are career and life accomplishments that the program prepares graduates to achieve within a few years after graduation. The Program Educational Objectives are defined by the faculty and approved by our Industrial Advisory Committee, which consists of faculty, local engineering employers, and at least one senior student in the program. The Program Educational Objectives of the Mechanical Engineering Technology program are:

1. Graduates will continue their professional development through involvement in professional organizations, formal educational opportunities, employer-based training programs, and other activities that enhance their technical and managerial abilities.

2. Graduates will be prepared to assume increasing levels of technical or managerial responsibility and to act as peer mentors in the area of Mechanical Engineering Technology or related fields.

3. Graduates will work to enhance their creativity and innovation in their approach to engineering design, solving problems, conducting experiments, and other critical aspects of their discipline.

4. Graduates will continue to improve in their ability to communicate effectively to diverse audiences through written, oral, and graphical means.

5. Graduates will exhibit a commitment to quality and ethics in their professional and personal lives.

The Program Educational Objectives are publicly available on the Mechanical Engineering website:

https://www.weber.edu/me/met.html

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

Objective 1 is focused on continuous learning, which is strongly connected to Weber State's core mission of learning, especially 1(a) and 1(c). By instilling in MET students the need for continuous learning, it is felt that they will continue to improve their abilities to solve technical problems and create high-quality designs, as well as lead in their professions.

Objective 2 is focused on preparing students to accept increasing responsibility in their future careers. This is objective is strongly connected to Weber State's core objective of service to the community. When students are prepared to accept increasing levels of responsibility, it directly benefits local companies, which in turn contributes to the economic development of the region.

Objective 3 is focused on creativity and innovation, which are critical skills in the continuously evolving world of engineering technology. This objective is strongly connected to Weber State's core mission of learning, particularly 1(b) and 1(d). By creating environments where students can explore and create will foster student aptitude for innovation that will continue to allow them to develop throughout their professional careers.

Objective 4 is focused on communication skills. While this objective does not clearly link to a specific core mission of the University, strong communication skills are essential for future learning, access, and improvement of the local community. Professionals in engineering and

technology-related fields have historically been criticized for their communication skills, and the program attempts to develop in students not only exceptional technical skills but also excellent communication skills.

Objective 5 is focused on quality and ethics. While this objective does have a strong connection to Weber State's core mission of community, it also connects strongly to all other aspects of academia and industry. The success of engineering and technology-based companies depends on their employees' dedication to quality and ethics. Without these qualities, defective systems and products would soon lose customer confidence, which would be detrimental to the local economy and its culture.

D. Program Constituencies

There are two major constituencies of the WSU Mechanical Engineering Technology Program, students and employers.

1. Students

At WSU, students are considered our "customers" in the sense that our institution is a student-centered university focused on the progress and success of students. Technical knowledge and ability are at the core of any engineering technology program. Multiple PEOs relate to students continuing to improve these skills after graduation (PEO 1 and PEO 3). Students are urged to continue their learning inside and outside the classroom while in school and particularly after graduation. This is intended to prepare students to receive increasing levels of responsibility after graduation (PEO 2)

Effective communication and working in teams (PEO 4) are central to the education of an engineering technology student. The students' senior projects are conducted in teams, and communication is an integral part of the senior project design reviews and the engineering seminar, as well as parts of other courses throughout the program.

Professional ethics and social awareness are attributes of a successful, ethical, and educated person in engineering or any other field (PEO 5). This program educational objective is addressed primarily in the engineering seminar class.

2. Employers

The MET program supports manufacturing industries in Utah, where there are over 1150 firms with ten or more employees. This manufacturing base is diverse, representing many different types of firms. This diversity prevents us from focusing narrowly on any single aspect of design, manufacturing, materials, testing, or processes, and we try to involve a significant cross-section of these stakeholders on our Industrial Advisory Committee. Most of our graduates are employed in northern Utah, which includes primarily Weber County, Salt Lake County, and Davis County.

Important local manufacturing firms include the following:

Advanced Drainage Systems	Associated Food Stores
ATK	Autoliv
Barnes Aerospace*	Boeing*
Cerrowire	Chromolox*
Clean Machine*	ClearStream Environmental*
CT Film	DCA
DFG	England/Corsair
Fieldcrest Cabinets	FMC JBT Corporation*
Fresenius	Futura Industries*
Great Salt Lake Mineral	GSC Foundries*
Honeywell	Intouch Machining
JD Machine*	Layton City
LeanWerks*	L3 Communications
Lifetime Products*	Naptech
National Standard	Northrop Grumman
Orbit	Parker Hannifin
Petersen, Inc.	PRE Manufacturing*
ProMold*	Setpoint Systems
Sydandee Manufacturing	Syro
Wavel Huber Wood Products	Westech
Western Zirconium	Williams International*
W.R. White Company	

* Companies with current members on the Industrial Advisory Committee.

The Program Educational Objectives are specifically designed to meet the needs of these constituencies by providing program graduates with the skills and abilities to succeed as employees, meeting the requirements of the faculty, and providing students with the information and knowledge they will need to be successful following graduation.

E. Process for Review of the Program Educational Objectives

The Program Educational Objectives were defined by the faculty and approved by the Industrial Advisory Committee (IAC) prior to the upcoming accreditation visit in 2021. The approach used for the review of the Program Educational Objectives is described below.

The Industrial Advisory Committee which consists of program faculty, the Dean of the college, engineering managers from local engineering companies, and at least one senior Mechanical Engineering student, is tasked with reviewing and potentially revising the Program Educational Objectives. This committee convenes once per year. Topics and issues discussed by this committee include, but are not necessarily limited to, the following:

1. Review of program educational objectives
2. Program structure
3. Content of courses
4. Declared majors and course enrollments

5. Graduate projections
6. Internship opportunities
7. Full-time hiring projections
8. Capstone senior projects and funding

Minutes of the previous IAC meetings will be available for review by the ABET team.

CRITERION 3. STUDENT OUTCOMES

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

The MET Student Outcomes (SOs) are established and revised by the ME department with feedback from the Industrial Advisory Committee (IAC), alumni, and current students. The SOs are reviewed on a regular basis as shown in Table 3-1 below. The current SOs were established in the Fall of 2020 when the Mechanical Engineering Technology (MET) program was preparing the self-study report for the 2021 ABET accreditation cycle. These SOs were developed to meet the needs of the program constituencies as well as comply with ABET's outcome-based evaluation procedure.

Table 3-1: Sources used to establish and revise the student outcomes.

Term	Sources Used	Actions Taken
Fall 2017	- Exit Exam - Exit Survey - Annual Assessment Report - Inputs from IAC	- Evaluated program learning outcomes - Refined Exit Exam - Collected additional data
Fall 2018	*(same as above)*	- Reviewed SOs - Reviewed PEOs
Fall 2019	*(same as above)*	- Evaluated program learning outcomes - New Faculty Hired
Fall 2020	*(same as above)*	- Updated PEOs - New Faculty Hired - Refined Exit Exam - Reviewed and updated PEOs

B. Student Outcomes

At the end of their study at WSU, students in the mechanical engineering technology program will be able to or will have attained:

(1) an ability to apply knowledge, techniques, skills and modern tools of mathematics, science, engineering, and technology to solve broadly-defined engineering problems in Mechanical Engineering Technology.

(2) an ability to design systems, components, or processes meeting specified needs for broadly-defined engineering problems in Mechanical Engineering Technology.

(3) an ability to apply written, oral, and graphical communication in broadly-defined technical and non-technical environments; and an ability to identify and use appropriate

technical literature.

(4) an ability to conduct standard tests, measurements, and experiments and to analyze and interpret the results to improve processes.

(5) an ability to function effectively as a member as well as a leader on technical teams. Current student outcomes are documented and made accessible to the public at

https://www.weber.edu/me/met.html

C. Mapping of Student Outcomes to Criterion 3 Requirements for Student Outcomes

The MET program's student outcomes are very similar to the Criterion 3 ABET Student Outcomes, but have been modified by the faculty to be specific mechanical engineering technology and reflect department priorities. Due to the similarity of the outcomes, no mapping from the department SOs to the ABET SOs is required.

Table 3-2 maps the PEOs to the mechanical engineering technology SOs. This mapping illustrates how the attainment of the SOs will ensure that the mechanical engineering technology graduates are prepared or qualified to attain the program's PEOs.

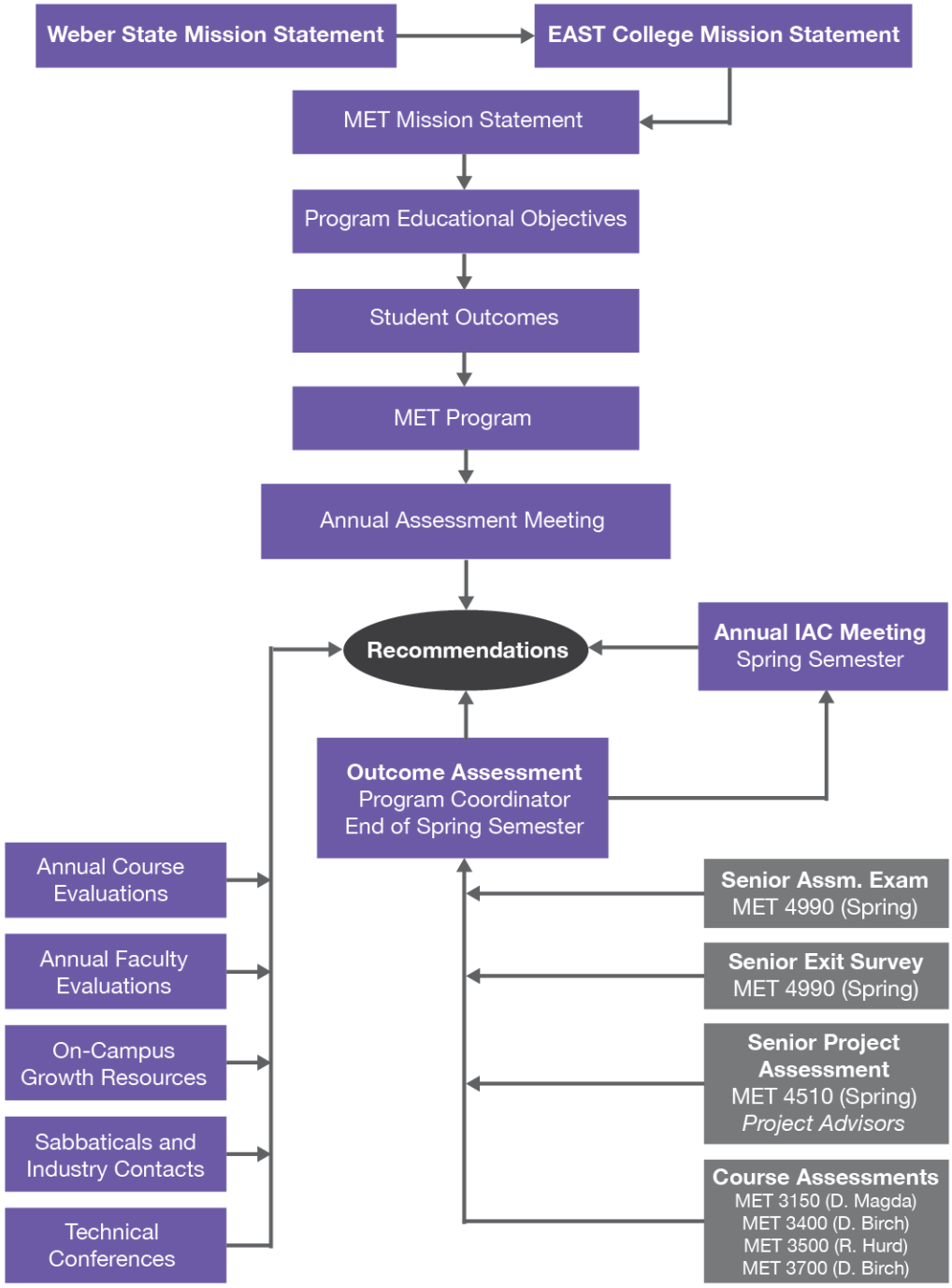
Table 3-2: Mapping of MET PEOs to the Criterion 3 SOs required by ABET.

	MET Student Outcomes				
MET Program Educational Objectives	SO1 - an ability to apply knowledge, techniques, skills and modern tools of mathematics, science, engineering, and technology to solve broadly-defined engineering problems in MET	SO2 - an ability to design systems, components, or processes meeting specified needs for broadly-defined engineering problems in MET	SO3 - an ability to apply written, oral, and graphical communication in broadly-defined technical and non-technical environments; and an ability to identify and use appropriate technical literature	SO4 - an ability to conduct standard tests, measurements, and experiments and to analyze and interpret the results to improve processes	SO5 - an ability to function effectively as a member as well as a leader on technical teams
PEO1 - Graduates will continue their professional development through involvement in professional organizations, formal educational opportunities, employer-based training programs, and other activities that enhance their technical and managerial abilities.	X		X	X	X
PEO2 - Graduates will be prepared to assume increasing levels of technical or managerial responsibility and to act as peer mentors in the area of Mechanical Engineering Technology or related fields.			X		X
PEO3 - Graduates will work to enhance their creativity and innovation in their approach to engineering design, solving problems, conducting experiments, and other critical aspects of their discipline.	X	X		X	
PEO4 - Graduates will continue to improve in their ability to communicate effectively to diverse audiences through written, oral, and graphical means.			X		X
PEO5 - Graduates will exhibit a commitment to quality and ethics in their professional and personal lives.	X	X		X	

CRITERION 4. CONTINUOUS IMPROVEMENT

A. Documentation of Process

The process shown below is used for assessment and to identify areas for improvement.



B. Assessment Metrics and Methods

The Student Outcomes (SOs) are routinely assessed using metrics described below. The MET Co-Program Coordinators, Tariq Arif and Randy Hurd, are tasked with compiling assessment data as part of an annual program review. The assessment results are presented to the department at an annual Program Assessment Meeting.

NOTE - COVID 19 disrupted assessment procedures for the spring of 2020. In some courses, data collection was severely limited.

1. A Senior Assessment Exam is used as part of the assessment of SO1. This exam is based on the FE Exam, covers key topics in Mechanical Engineering Technology, and is administered to every senior in the MET 4990, Seminar in Mechanical Engineering Technology, course. The exam covers the following topics:

Statics	Mechanics of Materials	Dynamics
Material Science	Machine Design	Thermodynamics
Fluid Mechanics	Heat Transfer	Vibrations
Control Systems	Dynamic System Modeling	Mathematics
Diversity	Ethics & Professionalism	

   The exam consists of 84 questions that students work through. It is an open book, open notes and no time limit. Students can have two attempts where their best score is recorded. The exam was administered to students in ME 4990 for the first time during the fall of 2019. It is planned to collect ongoing data from this exam each year until we can statistically use this as a sustainable assessment measurement tool for continuous improvement.

2. Assessment of student work from the MET 4510 (Senior Project) course in part uses the four rubrics listed below. These rubrics are used as part of the metrics to evaluate the SOs covered by the senior project course and are shown in Appendix F. The instructors of MET 4510 are responsible for these assessments and, upon completion, forward this information to the Program Coordinator.

   - SP1 – Written Report Rubric
   - SP2 – Presentation Rubric
   - SP3 – Peer Review Rubric
   - SP4 – Teamwork Rubric (Instructor)

3. Performance Indicators from Course Evaluation Rubrics from the following courses:

    - MET 3150 Engineering Technology Materials
    - MET 3400 Machine Design
    - MET 3500 Mechanical Measurement & Instrumentation
    - MET 3700 Testing & Failure Analysis

    Individual course instructors have the primary responsibility to assess the PIs in their courses. *The PIs are assessed using hard data such as student performance on a particular test question or assignment, not merely instructor judgment.* In addition to that, the instructor posts scores from the rubrics for his/her section in a shared server for review by the department chair and program coordinator(s). The rubrics listed above can be found in Appendix F.

    The department chair and the program coordinator(s) facilitate program-wide coordination meetings at the beginning of each semester. During these meetings, all faculty members review the current PIs, assessment data, and rubrics. Faculty members then propose suggestions for potential improvements based on the overall assessment data. The department chair approves any action items, if needed, to the current course instructor or program coordinator(s).

4. An Industrial Advisory Committee Annual Survey (anonymous) is administered at the annual IAC meeting. The latest survey used can be found in Appendix F. The purpose of the survey is to assess the roles of members of the committee and their opinion of Weber State University Graduates as well as to gather information feedback on software preferences, company needs, and ideas for program improvement.

5. Student exit surveys (anonymous) are administered as part of the MET 4990, Seminar in Mechanical Engineering Technology, course, where the questions are as shown in Appendix F. Students are asked to rate most questions on a scale of 1-5 with 1=very poor, 2=poor, 3=average, 4=good, and 5=very good. There are also some open-ended questions in the survey. While the results of these surveys are not used for assessment purposes, useful information can be obtained from the open-ended comments and questions regarding the program, which can be used for continuous improvement.

C. Assessment Schedule and Frequency

Assessment data are gathered throughout the year, but the complete results are gathered and analyzed each spring by the Program Coordinator and then shared with the department at the

annual program assessment meeting. An internal assessment report (created for the University administration) is compiled every three years.

D. Evaluation

Tables 4-1 through 4-5 present the performance indicators (PIs) and the expected level of attainment for each student outcome along with recent improvement efforts. Formal assessment is performed annually in the spring, and results are presented to the department faculty members annually. Every two years, an internal assessment report, or the ABET final report if available, is reported to the University Office of Institutional Effectiveness.

In order to assess the student outcomes, data is collected and evaluated from the various sources mentioned above. Three outcomes are possible as a result of this evaluation:

(A) If the performance target is met for each PI, no action is necessary.
(B) If the performance target is not met for one PI, the issue is considered a minor shortcoming, and a plan for corrective action is created by the Program Coordinator and associated instructor.
(C) If the performance target is not met for 2 or more PIs, the issue is considered a major shortcoming and is discussed as a department in the annual program assessment meeting. Corrective action is determined by the Department and implemented in the next academic year.

All of the assessment instruments and the results of those assessments will be available on the shared drive.

E. Using Results of Assessment and Evaluation for Continuous Improvement

All Student Outcome (SO) metrics were acceptable in the 2019-2020 assessment, except for SO4 where one of the PI targets was not met. When only one target is not met for a PO, we consider this a minor shortcoming, and the issue is addressed by the Program Coordinator.

The PI that was not met for SO4 comes from the course evaluation rubric for MET 3150, which requires that each student “[demonstrate an ability to] perform a tensile test measurement in accordance with the ASTM E8-20 standard.” This PI received a score of 1.5/4.0 where the PI target is >2.5. This score is determined from final grades on an assignment. The instructor believed that the complexity of the test led students to make mistakes while collecting data. The program coordinator and the course instructor have

decided to have a demonstration of the procedure recorded and made available to the students so they can watch the test multiple times before collecting the data themselves.

F. Using Other Input for Continuous Improvement

Improvements from Student/Faculty Feedback

The following feedback was received from students, either through Senior Student Surveys or through direct communication with faculty members.

1. Students would like to have a wider variety of technical electives.
    a. Action Taken: Faculty discussed additional technical electives that could be added to the current list. The Program Coordinator is in the process of submitting this proposed curriculum change to the college curriculum committee.

2. The Thermal Science course (MET 4650) is very fast-paced, and students would appreciate additional breadth in these topics.
    a. Action Taken: Faculty discussed this feedback and decided that Thermal Science should be split into a two-course sequence. The Program Coordinator is in the process of submitting this proposed curriculum change to the college curriculum committee.

Improvements from Industrial Advisory Committee Recommendations

Industrial Advisory Committee (IAC) Meetings occur on an annual basis. Suggested changes to the PEOs, SOs, and curriculum are offered intermittently by our Industrial Advisory Board (IAC). The faculty also maintain close contact with other industry partners outside of the IAC and often make small adjustments to course content based on their input. As part of these meetings, the department asks for feedback on program graduates and any skills they feel are lacking. The following advice was given from the Industrial Advisory Committee meeting in 2019.

1. Graduates need improved Excel skills.
    a. Action Taken: Faculty discussed where Excel could be integrated into the curriculum. Instructors for MET 1500 Mechanical Design Engineering and MET 2500 Modern Engineering Technology agreed to create new content on Excel basics, data analysis tools, and a new assignment requiring the use of Excel.

Students in these classes will be notified of instructional videos made by WSU Computer Literacy Center on using Excel software.

2. Graduates need improved technical writing skills.
    a. Two lectures on writing were added to two courses (MET 1500 & MET 3500). The quality of writing expected on the final report for MET 1500 was increased, and a rubric was created to provide clear expectations to students. Lab Reports in MET 3500 now require a paragraph format and are also graded according to a detailed rubric which includes points for organization and grammar.

3. Graduates need improved understanding of GD&T.
    Changes were made to reinforce ASME Y14.5 GD&T in PDD 1010 and MET 4990. PDD 1160 Geometric Dimensioning & Tolerancing using 3D CAD is to be added to the list of approved technical electives. Until the change is official, the Program Coordinator will approve this course as a technical elective (lower-division) for any interested students.

Other Sources of Possible Improvements

Other activities that may contribute to program improvements include the following:

- **Conferences** – faculty are encouraged to travel to one conference per year

- **Scholarship efforts by faculty** – faculty are required to participate in scholarship efforts to gain tenure and are reviewed post-tenure for continued performance in this area.

- **Teaching and Learning Forum** – The Teaching and Learning Forum (TLF) regularly offers professional growth opportunities throughout the academic year. Faculties are encouraged to use Training Tracker from the WSU's portal for specialized computer classes and human resource training. In addition to that, WSU provides all faculty members free access to LinkedIn Learning. These online courses and training activities are expected to enhance overall faculty skills in using technologies in the classroom

- **The Adjunct Faculty Academy** – The adjunct faculty academy is a series of online sessions that any faculty can watch and learn at their own pace. The goal of this program is to provide adjunct faculty with the essentials they need to be using to revamp their courses. Although these training sessions are voluntary, additional stipends and compensations are given to the faculties who complete these training.

https://weber.edu/adjunctfaculty/adjunct-academy.html

- **Faculty symposium** – Annual faculty symposium is held in each year's spring session, where all faculties are invited to participate. In this symposium, extensive discussions regarding current issues in education and the use of new technologies are analyzed, and recommendations are made. This year (Spring 2021) faculty symposium was held virtually, and all the presentations and posters are found at https://weber.edu/tlf/faculty_symposium.html

- **Sabbaticals taken by faculty** – faculty are allowed a year sabbatical after six years of tenured teaching or a one-semester sabbatical after three. Faculty generally use these to improve their technical skills by working in the industry.

- **Course Evaluations** – Each tenured faculty member is required to have their teaching evaluated in two courses by students every academic year. Non-tenured faculty must have each course evaluated every semester. Results from these evaluations result in gradual improvements in how courses are presented over time and improve the faculty's ability to impart essential knowledge. These evaluations are not used in formal ABET assessment but are used in tenure and performance evaluations.

Student Outcome 1: *An ability to apply knowledge, techniques, skills and modern tools of mathematics, science, engineering, and technology to solve broadly-defined engineering problems in Mechanical Engineering Technology.*

Table 4-1 Assessment of Student Outcome 1

Performance Indicators (PI) for this outcome (PI identifies the *measurable* student performance/activity used to assess student attainment of the student outcome)	Method used to assess PI (exam question, report evaluated with rubric, etc.)	Course(s) where the PI's assessment data were collected	Number of students assessed	State how Often the PI is Assessed	Year & Semester when Data Were or Will Be Collected	Average score	Performance Target for PI [MS = Mean Score]
Senior Assessment Exam, Average Score	Exam Questions	MET 4990	6	Annually	Sp 21	90%	MS > 65%
Senior Project Report Rubric (SP1), Criteria 8 Score (see Tbl. 4-6)	Report Rubric	MET 4510	14	Annually	Sp 21	2.94/3.0	MS >= 2
Performance Indicator (PI) #1 from Course Evaluation Rubric	Exam Question	MET 3400	15	Annually	Sp 21	4/4	MS > 2.5
PI #1 from MET 3700 C.E. Rubric	Exam Question	MET 3700	10	Annually	Fa 20	4/4	MS > 2.5
Results of Evaluation of Aggregated Assessment Data: *For Student Outcome 1, all performance targets were met.*							
Actions for Continuous Improvement: *No major actions were taken.*							
Results of Actions for Improvement *No major actions were taken.*							

Student Outcome 2: *An ability to design systems, components, or processes meeting specified needs for broadly-defined engineering problems in Mechanical Engineering Technology.*

Table 4-2 Assessment of Student Outcome 2

Performance Indicators (PI) for this outcome	Method used to assess PI	Course(s) where the data were collected	Number of students assessed	State how Often the PI is Assessed	Year & Semester when Data Were Collected	Average Score	Performance Target for PI [MS = Mean Score]
Senior Project Report Rubric (SP1), Criteria 3 Score (see Tbl. 4-6)	Report Rubric	MET 4510	14	Annually	Sp 21	2.65/3.0	MS >= 2
SP1 Criteria 4 Score (see Tbl. 4-6)	Report Rubric	MET 4510	14	Annually	Sp 21	2.95/3.0	MS >= 2
Senior Project Presentation Rubric (SP2), Criteria 7 Score (see Tbl. 4-7)	Pres. Rubric	MET 4510	14	Annually	Sp 21	2.93/3.0	MS >= 2
Performance Indicator (PI) #2 from Course Evaluation Rubric	Exam Question	MET 3400	15	Annually	Sp 21	3/4	MS > 2.5
PI #2 from MET 3700 C.E. Rubric	Exam Question	MET 3700	10	Annually	Fa 20	4/4	MS > 2.5
Results of Evaluation of Aggregated Assessment Data: *For Student Outcome 2, all performance targets were met.*							
Actions for Continuous Improvement: *Though all performance targets were met, we received feedback from the IAC that graduates need to have improved skills in geometric dimensioning and tolerancing. Changes were made to reinforce ASME Y14.5 GD&T in PDD 1010 and MET 4990. PDD 1160, Geometric Dimensioning & Tolerancing using 3D CAD, is to be added to the list of approved technical electives. Until the change is official, the Program Coordinator will approve this course as a technical elective (lower-division) for any interested students.*							
Results of Actions for Improvement *No major actions were taken.*							

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

Table 4-3 Assessment of Student Outcome 3

Performance Indicators (PI) for this outcome	Method used to assess PI	Course(s) where the data were collected	Number of students assessed	State how Often the PI is Assessed	Year & Semester when Data Were Collected	Average Score	Performance Target for PI [MS = Mean Score]
Senior Project Report Rubric (SP1), Criteria 5 Score (see Tbl. 4-6)	Report Rubric	MET 4510	14	Annually	Sp 21	2.95/3.0	MS >= 2
SP1 Criteria 6 Score (see Tbl. 4-6)	Report Rubric	MET 4510	14	Annually	Sp 21	2.94/3.0	MS >= 2
SP1 Criteria 7 Score (see Tbl. 4-6)	Report Rubric	MET 4510	14	Annually	Sp 21	2.94/3.0	MS >= 2
Senior Project Presentation Rubric (SP2), Criteria 2 Score (see Tbl. 4-7)	Pres. Rubric	MET 4510	14	Annually	Sp 21	2.90/3.0	MS >= 2
SP2 Criteria 5 Score (see Tbl. 4-7)	Pres. Rubric	MET 4510	14	Annually	Sp 21	2.71/3.0	MS >= 2
Performance Indicator (PI) #1 from Course Evaluation Rubric	Report Rubric	MET 3500	8	Annually	Fa 20	4/4	MS > 2.5
Results of Evaluation of Aggregated Assessment Data: *For Student Outcome 3, all performance targets were met.*							
Actions for Continuous Improvement: *Though all performance targets were met, we received feedback from the IAC that graduates need to have improved technical writing skills. In response, we have created more detailed evaluation rubrics for technical writing assignments (in MET 1500 & MET 3500). The Program Coordinator is in the process of creating content for lectures on technical writing that can be given in MET courses in order to give students more exposure to writing topics. Students will be strongly encouraged to use the on-campus writing center for future projects.*							
Results of Actions for Improvement *No results have been noted at this time.*							

Student Outcome 4: *An ability to conduct standard tests, measurements, and experiments and to analyze and interpret the results to improve processes.*

Table 4-4 Assessment of Student Outcome 4

Performance Indicators (PI) for this outcome	Method used to assess PI	Course(s) where the data were collected	Number of students assessed	State how Often the PI is Assessed	Year & Semester when Data Were Collected	Average Score	Performance Target for PI [MS = Mean Score]
Senior Project Report Rubric (SP1), Criteria 2 Score (see Tbl. 4-6)	Report Rubric	MET 4510	14	Annually	Sp 21	2.73/3.0	MS >= 2
Performance Indicator (PI) #1 from Course Evaluation Rubric	Lab Assignment	MET 3150	12	Annually	Sp 21	4/4	MS > 2.5
PI #3 from MET 3150 C.E. Rubric	Lab Assignment	MET 3150	12	Annually	Sp 21	1.5/4	MS > 2.5
PI #4 from MET 3400 C.E. Rubric	Exam Question	MET 3400	15	Annually	Sp 21	3/4	MS > 2.5
PI #4 from MET 3700 C.E. Rubric	Exam Question	MET 3700	10	Annually	Fa 20	4/4	MS > 2.5
Results of Evaluation of Aggregated Assessment Data: *For Student Outcome 4, the target performance was not met for the third PI listed in the table above (MET 3150 Rubric, PI-3).*							
Actions for Improvement *The PI that was not met comes from the course evaluation rubric for MET 3150 which states that students should "[demonstrate an ability to] perform a tensile test measurement in accordance with the ASTM E8-20 standard." This PI received a score of 1.5/4.0 where the PI has a target of >2.5. This score is determined from final grades on an assignment. The instructor believes that the complexity of the test led students to make mistakes while collecting data. The program coordinator and the course instructor have decided to have a performance of the procedure recorded and made available to the students so they can watch the test multiple times before collecting the data themselves.*							
Results of Actions for Improvement *As the above actions have not yet been implemented, no results have been noted as yet.*							

Student Outcome 5: *An ability to function effectively as a member as well as a leader on technical teams.*

Table 4-5 Assessment of Student Outcome 5

Performance Indicators (PI) for this outcome	Method used to assess PI	Course(s) where the data were collected	Number of students assessed	State how Often the PI is Assessed	Year & Semester when Data Were Collected	Average Score	Performance Target for PI [MS = Mean Score]
Senior Project Peer Review Rubric (SP3) Score	Report Rubric	MET 4500, 4510	14	Annually	Sp 21	2.93/3.0	MS >= 2
Senior Project Teamwork Rubric (SP4) Score (Faculty)	Report Rubric	MET 4500, 4510	14	Annually	Sp 21	2.93/3.0	MS >= 2
Senior Project Presentation Rubric (SP2) Total Score	Presentation Rubric	MET 4510	14	Annually	Sp 21	2.82/3.0	MS >= 2
Results of Evaluation of Aggregated Assessment Data: *For Student Outcome 5, all performance targets were met.*							
Actions for Continuous Improvement: *No major actions were taken.*							
Results of Actions for Improvement *No major actions were taken.*							

Table 4-6 Senior Project Written Report Rubric (SP1)

Team	Date	Faculty Advisor	Faculty Evaluator(s)
Faculty Evaluator: Please collect all the evaluation forms and return the results to Randy Hurd or Tariq Arif by the end of the semester.			
Criteria			**Score**
1. Adequate problem definition & project technical description			
2. Appropriate use of experiments, testing, measurements, & prototyping			
3. Appropriate design assumptions, techniques, & engineering analysis			
4. Appropriate utilization of engineering tools (i.e CAD software, analysis software, etc.)			
5. Appropriate use of graphs, tables, & figures.			
6. Appropriate format, technical writing technique, & logical flow of information			
7. Complete, accurate references, & bibliography			
8. Demonstrated application of engineering principles to formulate a solution to a technical problem			
Evaluation Scale:	3.0 Good	2.0 Average	1.0 Poor	0.0 Unacceptable

Table 4-7 Senior Project Presentation Rubric (SP2)

Team	Date	Faculty Advisor	Faculty Evaluator(s)
Faculty Evaluator: Please collect all the evaluation forms and return the results to Randy Hurd or Tariq Arif by the end of the semester.			
Criteria			**Score**
1. Introduction of project & design problem description			
2. Appropriate presentation materials (slides, visual aids, video clips, photographs, models, etc.)			
3. Technical content of presentation			
4. Team member appearance & professionalism			
5. Flow of presentation (including transitions between presenters)			
6. Closing summary with follow-up questions handled correctly			
7. Prototype demonstration			
8. Demonstrated application of engineering principles to formulate a solution to a technical problem			
Evaluation Scale:	3.0 Good	2.0 Average	1.0 Poor	0.0 Unacceptable

Table 4-8 Senior Peer Review Rubric (SP3)

Student Name:				
Student: Rate how well your teammates performed in the following areas:				**Score**
1. Attended team meetings				
2. Participated in discussions and contributed to the design				
3. Volunteered and accepted assignments				
4. Met deadlines and provided feedback				
Average score:				
Average score from all team members is used for final grade and student outcome assessment				
Evaluation Scale:	3.0 Good	2.0 Average	1.0 Poor	0.0 Unacceptable

Table 4-9 Senior Project Teamwork Rubric (SP4)

Student Name:				
Instructor: Rate student on the following criteria:				**Score**
1. Attended meetings, accepted and completed assignments				
2. Participated in discussions and made valuable contribution to the project				
Average score:				
Evaluation Scale:	3.0 Good	2.0 Average	1.0 Poor	0.0 Unacceptable

CRITERION 5. CURRICULUM

A. Program Curriculum

1. The MET program at Weber State University provides students with a balanced curriculum, as seen in table 5.1 below. The program is based on a semester system. This breakdown also illustrates that adequate time and attention are given to each curricular component, consistent with the objectives of the program and the institution.

2. Table 5.2 shows how the courses in the major and the other courses in the program support the Student Outcomes.

3. The curriculum also includes several series of courses requiring prerequisites. These series help provide students with depth in their program of study as well as assuring student success in the follow-on courses. This breakdown also illustrates that adequate time and attention are given to each curricular component, consistent with the objectives of the program and the institution. Table 5.3 contains the "degree map" for the MET program. The map shows specific prerequisites that build skills in math, science, and related technical areas.

4. The number of credit hours required for the MET degree is 123, with 70 credit hours (57%) coming from technical courses. The remaining credit hours (53 or 43%) come from courses on mathematics, science, communication, and general education. This breakdown provides students with technical breadth and depth relevant to each specific discipline while also providing the student with sufficient breadth in their overall education.

   The baccalaureate degree curricula include the application of calculus in simple strength of materials applications in MFET 2300, Statics and Strength of Materials. Applications of calculus are also discussed in MET 3050, Dynamics, and MET 4650, Thermal Sciences.

5. Labs in the curriculum develop student proficiency in the use of current technology, equipment, and tools common to the discipline that are appropriate to our student outcomes and the discipline. All MET students are required to take the following courses:

a MFET 1210, Machining Principles Lecture/Lab, where students are exposed to basic lathe and mill terminology and operation, metrology and process planning. This course provides a fundamental foundation for the rest of the program.

b EET 1850 Industrial Electronics, in which all students are required to have integrated hands-on lab experiences which reinforce concepts taught in the classroom, including basic electrical and electronics principles and applications.

c PDD1010, Introduction to Engineering and Technical Design, which uses 3D CAD to introduce current CAD technology and geometric dimensioning and tolerancing using Solidworks 2021.

d MET 3150, Engineering Technology Materials, contains lab demonstrations involving heat treatment of metals and materials testing.

e MET 3300, Computer Programming Applications of MET, in which students are introduced to scientific computing and how Matlab or Visual Basic can be used to solve common engineering problems.

f MET 3500, Mechanical Measurements and Instrumentation, contains lab assignments where students gain experience using multiple instruments such as thermocouples and data acquisition systems, including exposure to data acquisition software.

g The MET 4500 and MET 4510, Senior Project I and II, courses require students to actually use WSU lab equipment in their design/build senior projects. Students typically will use the machine shop, AWJ, plasma, 3D printers, CNC mills, and CAD software. Some equipment resources are provided by local manufacturing firms as needed for some projects.

6. The curriculum provides both physical and natural science content appropriate to MET and the laboratory experiences of the students. All students are required to take PHYS 2210, Physics for Scientists and Engineers, which has a required lab as well as CHEM 1110, Elementary Chemistry, which also has a required lab. Students are also required to take a Life Science elective for three credits. These classes build a substantial science-based foundation for the technical core of the program.

7. The two Mechanical Engineering Technology senior project courses provide students with a significant capstone experience during their final year in the program. It also allows students to demonstrate how well they have mastered the technical skills of the discipline. By working in a team environment, students have the opportunity to demonstrate their mastery of teamwork, communications, human relations, and management. These courses allow students to apply the current knowledge they have, as well as seek to adapt new applications of technology they may discover in the course of considering alternative solutions to problems. These courses further develop in students a commitment to quality, timeliness, and continuous improvement as their team progresses through the various phases of their project.

8. Professional and ethical responsibilities, diversity and inclusion awareness, quality, and continuous improvement are addressed in multiple classes but are particularly emphasized in the MET 4990, Seminar in MET, course. All of these topics are further reinforced in the

capstone courses. Additionally, WSU required general education plays a large role in making students aware of these issues. Students are required to take an oral communication course (COMM 2110 or COMM 1020), where these topics are also taught. Finally, all students are required to take a general education course which emphasizes diversity.

9. The program does allow cooperative education to satisfy curricular requirements regarding MET electives but does not require a cooperative experience or internship. Students taking the cooperative education class are required to submit a paper to faculty related to their work experience as an academic component.

10. The following materials will be made available for review by the evaluation team:

    a. Course syllabi are shown in Appendix A. Syllabi will also be available on a shared drive once the team is identified.
    b. Recent samples of student work will be made available on a shared drive once the team has been identified. The curriculum grid provided indicates which SOs the different courses support.
    c. Recent Senior Project documentation will be made available to the team on a shared drive.
    d. Sample student work from courses, including labs, will be available on the shared drive.
    e. The required continuous improvement reports for the program will also be available as a shared Box File when the team is identified.

B. Course Syllabi

Course syllabi for each course in the degree are provided in Appendix A.

C. Advisory Committee

The MET program supports the manufacturing and architectural industries in Utah, where there are over 1150 firms with ten or more employees. This manufacturing base is diverse, representing many different types of firms. This diversity prevents us from focusing narrowly on any single aspect of design, manufacturing, materials, testing, or processes, and we try to involve a significant cross-section of these stakeholders on our Industrial Advisory Committee. Most of our graduates are employed in northern Utah, which includes primarily Weber County, Salt Lake County, and Davis County. Current members of the Industrial Advisory Committee and their affiliations are given below:

Industry & Member Names:

Barnes Aerospace - Dan Berry
FMC JBTC - Brian Deroche
ProMold - Dave Farrell
GSC Foundries - William Fitzgerald
Clean Machine - Mark Jones
Leanwerks - Reid Leland
Futura Industries - Daniel Taylor
Boeing - Mark Ripke
Chromalox - Craig Johnson
Lifetime Products - Dave Winters
Williams International - Jake Funk
Williams International - Doug Hogge
ClearStream Environmental - Travis Kenworthy
PRE - Mark Hardcastle
JD Machine - Maury Chambers
JD Machine - Matt Wardle (not active)
Autoliv - Jason Mecham
ATK - Michael Memmott

Table 5-1 Curriculum

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, or Quarter	Average Section Enrollment for the Last Two Terms the Course was Offered[1]
		Math and Physical/ Natural Sciences	Discipline Specific Content	General Education	Other		
Freshman - Fall							
MET 1000 Introduction to Mechanical Engineering Technology	R		*3*			*S20, F20*	*12*
PDD 1010 Introduction to Engineering & Technical Design	R		*3*			*F20, S21*	*15*
ENGL 1010 Introductory College Writing	R			*3*		*F20, S21*	
MATH 1080 Pre-Calculus	R	5				*F20, S21*	
LIBS 1704 Information Navigator	R			*1*		*F20, S21*	
Freshman - Spring							
MET 1500 Mechanical Design Engineering	R		*3*			*F20, S21*	*8*
COMM 2110 Interpersonal & Small Group Communications	R			*3*		*Su19, F20*	
ECON 1010 Economics as a Social Science	R			*3*		*F20, S21*	
ENGL 2010 Intermediate College Writing	R			*3*		*F20, S21*	
MATH 1210 Calculus I	R	4				*F20, S21*	
Sophomore - Fall							
MFET 2360 Manufacturing Processes & Materials	R			*3*		*F20, S21*	
CHEM 1110 Elementary Chemistry	R	5				*F20, S21*	
MATH 1040 Introduction to Statistics	R	3				*F20, S21*	

PHYS 2210 Physics for Scientists & Engineers I	R	5				*F20, S21*	
Sophomore - Spring							
MET 2500 Modern Engineering Technologies	R		*3*			*S20, S21*	*17*
MFET 2300 Statics & Strength of Materials	R		*5*			*F20, S21*	*15*
EET 1850 Industrial Electronics	R		*4*			*F20, S21*	*15*
Creative Arts/Diversity Elective	E			*3*		*F20, S21*	
Junior - Fall							
MET 3050 Dynamics	R		*3*			*F19, F20*	*16*
MET 3300 Computer Programming Applications of MET	R		*3*			*S20, S21*	*7*
MET 3400 Machine Design	R		*3*			*F20, S21*	*14*
ENGL 3100 Professional & Technical Writing	R			*3*		*F20, S21*	
American Institutions	R			*3*		*F20, S21*	
Life Science Elective	E	3				*F20, S21*	
Junior - Spring							
MET 3150 Engineering Technology Materials	R		*3*			*F20, S21*	*15*
MET 3500 Mechanical Measurements & Instrumentation	R		*3*			*F20, S21*	*7*
MET 4200 Mechanical Design with FEA	R		*3*			*S20, S21*	*11*
MFET 1210 Machining Principles	R		*3*			*F20, S21*	*14*
Humanities Elective	E			*3*		*F20, S21*	
Senior - Fall							
MET 3700 Testing & Failure Analysis	R		*3*			*S20, F20*	*10*
MET 4500 Senior Project I	R		*3*			*F19, F20*	*10*
MFET 3340 & 3340L Applied Fluid Power/Lab	R		*3*			*F20, S21*	*20*
Social Science Elective	E			*3*		*F20, S21*	
Technical Elective	SE		*3*			*F20, S21*	
Senior - Spring							
MET 4510 Senior Project II	R		*3*			*S20, S21*	*9*
MET 4650 Thermal Science	R		*3*			*S20, S21*	*15*
MET 4990 Seminar in Mechanical Engineering Technology	R		*1*			*S20, S21*	*15*

Technical Elective	SE		*3*			*F20, S21*	
Technical Elective	SE		*3*			*F19, F20*	
Add rows as needed to show all courses in the curriculum.		*25*	***70***	***28***			
OVERALL TOTAL CREDIT HOURS FOR THE DEGREE	123						
PERCENT OF TOTAL		*20%*	*57%*	*23%*			

Table 5-2 Course Alignment with Student Outcomes

Mechanical Engineering Technology

MET Course Alignment with Student Outcomes

MET Student Outcomes
1. an ability to apply knowledge, techniques, skills and modern tools of mathematics, science, engineering, and technology to solve broadly-defined engineering problems appropriate to Mechanical Engineering Technology;
2. an ability to design systems, components, or processes meeting specified needs for broadly-defined engineering problems appropriate to the discipline;
3. an ability to apply written, oral, and graphical communication in broadly-defined technical and non-technical environments; and an ability to identify and use appropriate technical literature;
4. an ability to conduct standard tests, measurements, and experiments and to analyze and interpret the results to improve processes;
5. an ability to function effectively as a member as well as a leader on technical teams.

	Student Outcomes				
Key: **I** = Introduce Concept, **R** = Reinfoce Concept, **E** = Emphasize Concept	**1**	**2**	**3**	**4**	5
Required AAS Courses					
Required MET Core and Support Courses					
MET1000 Introduction to Mechanical Engineering Technology	I				
MET1500 Mechanical Design Engineering	I	I	I		I
MET2500 Modern Engineering Technologies	I	I	E		
MFET2300 Statics and Strength of Materials	I			I	
MFET2360 Manufacturing Processes and Materials	I				
CEET1850 Industrial Electronics	I	I			
CHEM 1110 Elementary Chemistry	I				
PDD1010 Introduction to Engineering & Technical Design	I	I	I		
MATH 1040 Introduction to Statistics	I	I			
MATH 1080 Pre-Calculus	I				
MATH 1210 Calculus	I				
PHYS 2210 Physics for Scientists & Engineers	I				
Other Required General Education Support Courses					
COMM 2110 Interpersonal & Small Group Communication			I		I
ENGL 2010 Intermediate College Writing			R		
ECON 1010 Economics as a Social Science	I				
Creative Arts Elective					
Required BS Courses					
Required MET Core Courses					
MET3050 Dynamics	E	R			
MET3150 Engineering Technology Materials	R			E	
MET3300 Computer Programming Applications of MET	I/R				
MET3400 Machine Design	E	E		R	
MET3500 Mechanical Measurement and Instrumentation	E		E	R	
MET3700 Testing and Failure Analysis	E	R	E	R	
MET4200 Machine Design with FEA	E				
MET4500 Seinor Project I	E	E	E	R	E
MET4510 Senior Project II	R	E	E	R	E
MET4650 Thermal Science	E				
MET4990 Seminar in Mechanical Engineering Technology			E		
Required Support Courses					
MFET1210 Machining Principles Lecture/Lab	I				
MFET3340 Applied Fluid Power/Lab	R			R	
PS 3250 Business Communication (or ENGL 3100 Professional & Technical Writing)			R		
9 credit hours from technical elective courses (from approved list)	R				
12 credit hours from general education elective courses					

Table 5-3 Degree Map with Prerequisite Courses

Mechanical Engineering Technology - Graduation MAP

WEBER STATE UNIVERSITY

This is a suggested plan. Meet with an academic advisor to create a specific plan that best fits your academic needs. Remember, taking an average of 15 credit hours per semester facilitates timely graduation.

Catalog Year: 2020-2021 **NAME:**_____

☑	Course	Credit Hour	Semester Offered	Prerequisites	Notes
	Freshman (Semester 1)				
	MET 1000 Intro to Mechanical Engr Tech & Design	3	Fa, Sp		∀ Declare Major in MET
	PDD 1010 Intro to Engineering & Technical Design	3	Fa, Sp	MATH 0970 or MATH 0990	∀ MET will accept MATH 1050 & 1060 for MATH 1080 (C or better in both)
	ENGL 1010 Introductory College Writing	3	Fa, Sp, Su		
	MATH 1080 QL Pre-Calculus	5	Fa, Sp, Su	MATH 1010 or placement	
	LIBS 1704 IL Information Navigator	1	Fa, Sp, Su		∀ LIBS 1504 Information Literacy Competency Exam can be taken in lieu of LIBS 1704
	Total Semester Credits	**15**			
	Freshman (Semester 2)				
	MET 1500 Mechanical Design Engineering	3	Sp	MET 1000 & MATH 1010 or higher math placement	∀ C or better in all major and support courses
	COMM 2110 HU Interpersonal & Small Group Com	3	Fa, Sp, Su		
	ECON 1010 SS Economics as a Social Science	3	Fa, Sp, Su		
	ENGL 2010 EN Intermediate College Writing	3	Fa, Sp, Su	ENGL 1010 or placement	
	MATH 1210 Calculus I	4	Fa, Sp, Su	MATH 1050 & 1060 or MATH 1080	
	Total Semester Credits	**16**			
	Freshman (Optional)				
	Total Semester Credits				
	Sophomore (Semester 3)				
	MFET 2360 Manufacturing Processes & Materials	3	Fa, Sp		
	CHEM 1110 PS Elementary Chemistry	5	Fa, Sp, Su		
	MATH 1040 QL Introduction to Statistics **OR** MFET 2410 Quality Concepts & Statistical Applications	3	Fa, Sp, Su Fa, Sp	MATH 1010 or higher	
	PHYS 2210 PS Physics for Scientists & Engineers I	5	Fa, Sp	Co or prereq: MATH 1210	
	Total Semester Credits	**16**			
	Sophomore (Semester 4)				
	MET 2500 Modern Engineering Technologies	3	Sp	MET 1500	∀ Apply for graduation with an AAS degree in MET
	MFET 2300 Statics & Strength of Materials	5	Fa, Sp	PHYS 2010 or PHYS 2210, MATH 1060 or MATH 1080 or MATH 1210	∀ MET will accept MFET 2310 & 2320 for MFET 2300 (C or better in both)
	EET 1850 Industrial Electronics	4	Fa, Sp	MATH 1010 or higher	
	Creative Arts (CA)/ Diversity (DV)	3	Fa, Sp, Su		∀ Only 3 credits total are needed for Diversity (DV) requirement
	Total Semester Credits	**15**			
	Sophomore (Optional)				
	Total Semester Credits	**62**			

☑	Course	Credit Hours	Semester Offered	Prerequisites	Notes
	Junior (Semester 5)				
	MET 3050 Dynamics	3	Fa	MATH 1210, PHYS 2210, MFET 2300	∀ Only 3 credits total needed for Diversity (DV) requirement
	MET 3300 Computer Programming App of MET	3	Fa, Sp	MFET 2300	
	MET 3400 Machine Design	3	Fa, Sp	MFET 2300	
	PS 3250 Business Communication **OR** ENGL 3100 Professional & Technical Writing	3	Fa, Sp, Su	ENGL 2010	
	American Institutions (AI)	3	Fa, Sp, Su		
	Life Science (LS)/ Diversity (DV)	3	Fa, Sp, Su		
	Total Semester Credits	**18**			
	Junior (Semester 6)				
	MET 3150 Engineering Technology Materials	3	Fa, Sp	CHEM 1110, MFET 2300	∀ Apply for Senior Project ∀ AAS, AS, or AA prerequisite for Senior Project ∀ Only 3 credits total needed for Diversity (DV) requirement
	MET 3500 Mech Measurements & Instrumentation	3	Fa, Sp	EET 1850, MFET 2300	
	MET 4200 Mechanical Design with FEA	3	Fa, Sp	MET 3400, MFET 2300	
	MFET 1210 Machining Principles	3	Fa, Sp		
	Creative Arts (CA)/ Humanities (HU)/ Diversity (DV)	3	Fa, Sp, Su		
	Total Semester Credits	**15**			
	Junior (Optional)				
	Total Semester Credits				
	Senior (Semester 7)				
	MET 3700 Testing & Failure Analysis	3	Fa	MET 3150, MFET 2300	∀ Only 3 credits total needed for Diversity (DV) requirement ∀ Choose an approved 3 credit CS, PDD, EET, MATH, MET, MFET, or PHYS course for a technical elective
	MET 4500 Senior Project I MFET 3340 & 3340L Applied Fluid Power/ Lab	3 3	Fa Fa, Sp	MET 4200, AAS, AS, or AA MFET 2300 or MFET 2320 PHYS 2010 or PHYS 2210	
	Social Science (SS)/ Diversity (DV)	3	Fa, Sp, Su		
	Approved Technical Elective	3	Fa, Sp, Su		
	Total Semester Credits	**15**			
	Senior (Semester 8)				
	MET 4510 Senior Project II	3	Sp	MET 4500	∀ Choose an approved lower division 3 credit **and** upper division 3 credit CS, PDD, EET, MATH, MET, MFET, or PHYS course for a technical elective ∀ Apply for graduation with BS degree in MET
	MET 4650 Thermal Science	3	Sp	MATH 1210, PHYS 2210, CHEM 1110 or CHEM 1210	
	MET 4990 Seminar in MET	1	Sp	MET 4500	
	Approved Technical Elective	3	Fa, Sp, Su		
	Approved Upper Division Technical Elective	3	Fa, Sp, Su		
	Total Semester Credits	**13**			
	Senior (Optional)				
	Total Semester Credits				
	Total Bachelor Credits	**123**			

Gen Ed Breadth Requirements (do not duplicate departments)

☐ HU	☐ CA	☐ HU or CA
☐ SS	☐ SS	
☐ PS	☐ LS	☐ PS or LS
☐ DV (Double dip with breadth course)		

Avoid Misadvisement! Consult your academic advisor (weber.edu/advisors), The WSU Catalog (weber.edu/catalog), and your CatTracks degree evaluation (log into your eWeber Student Portal).

Accredited by the Engineering Technology Accreditation Board of Engineering and Technology (ABET) www.abet.org

MET Advisors: weber.edu/et/student_resources.html
Program Coordinator: Daniel Magda, 801-626-7636, dmagda@weber.edu
Advisor: eastadvising@weber.edu

Revision Date: 04/19/2019

CRITERION 6. FACULTY

A. Faculty Qualifications

The department faculty are highly qualified and have extensive academic and industrial experience. Further information regarding the qualifications of the faculty is given in Table 6.1 below, along with Appendix B which contains a resume for each faculty member teaching in the program.

B. Faculty Workload

Faculty workload is summarized in Table 6-2. Weber State University's full-time faculty are assigned a minimum teaching load of 24 credit hours per academic year, which means that faculty are required to teach approximately 12 credit hours per semester. Any teaching load above 12 credit hours per semester is considered overload, and faculty receive additional compensation for teaching overloads on a per credit hour basis at adjunct rates. In table 6-2 under teaching, this number represents the percent of time that the faculty spend on teaching activities.

The program coordinator receives three credit hours per semester reassigned time for that duty, and the department chair receives six credit hours per semester reassigned time for that duty. The “Other” category in Table 6-2 includes time devoted to such activities as advising, teaching in other programs, administrative responsibilities, sabbatical leaves, and committee work.

In addition to their normal teaching load, the MET faculty are required to set aside a minimum of five office hours per week for student advising and or class/lab help. Each of the faculty is also involved in providing service to the University by serving on various committees at the department, college, and university levels.

C. Faculty Size

The program is currently understaffed, and as a consequence, most MET faculty have been teaching an overload each semester. To address this situation, the ME department is in the process of hiring a full-time faculty member starting in July 2021.

D. Professional Development

The department and college usually provide adequate funding for each faculty to travel to at least one out-of-state conference, seminar, or workshop per year. The faculty also has the opportunity to participate in the WSU Teaching and Learning

Forum. The Teaching and Learning Forum was created by a group of faculty in 1992 and offers retreats, book groups, workshops, collaborative projects, and other initiatives in support of faculty development. Activities are directed by the Teaching, Learning, and Assessment (TLA) Committee, a standing committee of the Faculty Senate, and an appointed coordinator who also serves as chair of the TLA committee.

Tenured faculty are encouraged to take sabbatical leave, which is a leave of absence with compensation for one or two semesters as approved by the Board of Trustees for purposes of study, research, or other pursuits, the objectives of which are the professional improvement and advancement of faculty members as well as an increase in their usefulness to the institution. Sabbatical leaves are granted to faculty members only for purposes that will improve the ability of the recipient to discharge more effectively their teaching, research, or service responsibilities to the University. Sabbatical leave is accrued as follows:

After 3 years: 1 semester @ 100% salary for the semester
After 6 years: 2 semesters @ 75% salary for 2 semesters

Faculty on sabbatical are eligible for consideration for merit pay, advancement in rank, one-time bonuses, and for any general or special adjustment in salary received by other faculty members of the University per the WSU policies and procedures manual. Although faculty are not required to take sabbatical leave, the program has a rotation schedule set in place for all faculty who qualify for sabbatical leave in order to minimize disruption.

Each of the faculty is allowed up to eight hours per week to do consulting and to interact with the local industry.

E. Authority and Responsibility of Faculty

The primary responsibility for defining, revising, and implementing program educational objectives, the development of new courses, deletion or changes in existing courses, the initiation of new programs, the discontinuance of existing programs, or other program modifications lies with the faculty with advice from the MET Industry Advisory Committee (IAC). The program educational objectives and student outcomes are reviewed by the MET faculty and the IAC. The Department Chairman and the Dean's office are involved in reviewing the objectives, and substantial input is expected from the IAC, as shown in the continuous improvement section. Major reviews of educational objectives and outcomes are driven by the

ABET accreditation cycle. The review of this material is a major element in the yearly IAC meetings.

Part of the process used to ensure consistency and quality of instruction involves student assessment of select courses through the Course Instructor Evaluation Questionnaire (CIEQ). This survey looks at teaching performance, method of instruction, and the interest and attention of the instructor. Tenured faculty are required to have one course per semester evaluated using the CIEQ ~~system~~, whereas non-tenured faculty are required to have every course taught being evaluated every semester. Results from the CIEQ evaluations are maintained in each faculty member's professional file.

Faculty members are also responsible for planning and presenting course materials; establishing course objectives, requirements, and grading policies and making them known to students; selecting and ordering texts and supplemental materials; preparing, administering, and grading assignments, quizzes, and exams; and assigning grades. Grading and textbook ordering are done by following University policy. Faculty are responsible for identifying relationships between learning outcomes and course material and responsible for demonstrating that outcomes are adequately measured in each course. Changes in courses or the program require the approval of the department chair, the dean, and the University Curriculum Committee. Additional responsibilities of the faculty to the students and the university can be found in the WSU Policies and Procedure Manual at weber.edu/ppm/.

Outside Courses

The faculty listed below also taught support courses for the MET program in the 2020/21 academic year. The courses they taught, the semester in which they were taught, and their program with which they are affiliated are also shown. The vitaes for each of these faculty members are in Appendix B.

Kelly Harward, MFET

Fall Semester, 2020

MFET 2300, Statics and Strength of Materials

Spring Semester, 2021

MFET 2300, Statics and Strength of Materials

Russell Thomas, MFET

Fall Semester, 2020

MFET 1210, Machining Principles

Spring Semester, 2021
MFET 1210, Machining Principles

Kerry Tobin, MFET
Fall Semester, 2020
MFET 1210, Machining Principles
MFET 3340/L Applied Fluid Power
Spring Semester, 2021
MFET 1210, Machining Principles
MFET 3340/L Applied Fluid Power

Usui, Meg, PDD
Fall Semester, 2020
PDD 1010, Intro to Engineering & Technical Design (Solidworks)
Spring Semester, 2021
PDD 1010, Intro to Engineering & Technical Design (Solidworks)

West, Glen, PDD
Fall Semester, 2020
PDD 1010, Intro to Engineering & Technical Design (Solidworks)
Spring Semester, 2021
PDD 1010, Intro to Engineering & Technical Design (Solidworks)

Stenquist, Michael
Spring Semester, 2021
PDD 1010, Intro to Engineering & Technical Design (Solidworks)

Nizar AlAbdrabalrida, EET Adjunct Faculty
Fall Semester, 2020
EET 1850, Industrial Electronics (4)
Spring Semester, 2021
EET 1850, Industrial Electronics (4)

Table 6-1. Faculty Qualifications

Mechanical Engineering Technology

Faculty Name	Highest Degree Earned- Field and Year	Rank [1]	Type of Academ.	FT or PT[2]	Years of Experience	Professi.	Level of Activity[4] H, M, or L

					Govt./Ind. Practice	Teaching	This Institution		Professional	Professional	Consulting/summer
Daniel Magda (Dept. Chair)	Ph.D., Mechanical Engineering, 1995	P	T	FT	7	23	23		L	M	L
Tariq Arif (Program Co-Coordinator)	Ph.D., Mechanical Engineering, 2017	AST	TT	FT	4	8	3		M	M	L
Randy Hurd (Program Co-Coordinator)	Ph.D., Mechanical Engineering, 2017	AST	TT	FT	3	4	1		M	M	L
Dustin Birch	M.S., Mechanical Engineering, 2000	ASC	T	FT	14	10	10	PE	M	M	H
Kirk Hagen	Ph.D., Mechanical Engineering, 1989	P	T	FT	17	30	28		M	L	L
Randall Kent	M.S., Mechanical Engineering, 1985	I	NTT	FT	25	12	6		M	M	L
Spencer Petersen	Ph.D., Mechanical Engineering, 2016	I	NTT	PT	10	5	5		M	L	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.

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]	
Daniel Magda	FT	*Fall 2020* Department Chair (6) MET 3150 Engineering Technology Materials (3)	40	5	55	100

		MET 4250 Finite Element Analysis (3) *Spring 2021* Department Chair (6) MET 3150 Engineering Technology Materials (3) MET 4200 Mechanical Design with FEA (3)	40	5	55	100
Tariq Arif	FT	*Fall 2020* MET Program Co-Coordinator (1.5) ME 3040 Dynamic Systems Modeling (3) ME 3350 Engineering Computing (2) MET 3300 Computer Programming Applications (3) MET 4510 Senior Project II (3) ME 4100 Senior Project I (3) Release Time – ME Course Creation (1) *Spring 2021* MET Program Co-Coordinator (1.5) ME 3060 Sensors, Instrumentation & Controls (3) ME 3500 Numerical Methods for Engineering (3) MET 3500 Mechanical Measurement & Instrumentation (3) ME 4200 Senior Project II (3) ME 4550 Robotics (3)	45 45	10 10	45 45	100 100
Randy Hurd	FT	*Fall 2020* MET Program Co-Coordinator (1.5) ENGR 1000 Introduction to Engineering (2) ENGR 2010 Statics (3) MET 3500 Mechanical Measurement & Instrumentation (3) Release Time – New Instructor (3) *Spring 2021* MET Program Co-Coordinator (1.5) MET 1500 Mechanical Design Engineering (3) ENGR 2160 Materials Science & Engineering (4) ENGR 2160 Materials Science & Engineering (4)	60 60	10 10	30 30	100 100
Dustin Birch	FT	*Fall 2020* MET 3050 Dynamics (3) MET 4500 Senior Project I (3) MET 3400 Machine Design (3) MET 3700 Testing and Failure Analysis (3) ME 3050 (3)	70 70	10 10	20 20	100 100

		Spring 2021 MET 2500 Modern Engineering Technologies (3) MET 3400 Machine Design (3) MET 4510 Senior Project II (3) MET 4650 Thermal Science (3) MET 4990 Seminar in MET (1) ME 4990 Seminar in Mechanical Engineering (1)				
Kirk Hagen	FT	*Fall 2020* ENGR 1000 Introduction to Engineering (2) ENGR 1000 Introduction to Engineering (2) ENGR 2300 Thermodynamics (3) ME 3300 Fluid Mechanics (3) ME Program Coordinator (3) Pre-Engineering Program Coordinator *Spring 2021* ENGR Introduction to Engineering 1000 (2) ENGR 2080 Dynamics (5) ME 4000 Heat Transfer (3) ME Program Coordinator (3) Pre-Engineering Program Coordinator	60 60	10 10	30 30	
Randall Kent	FT	Fall 2020 ENGR 2010 Statics (3) ENGR 2300 Thermodynamics (3) ME 4900 Special Topics (3) *Spring 2021* ENGR 1000 Introduction to Engineering (2) ENGR 2140 Mechanics of Materials (3) ENGR 2140 Mechanics of Materials (3) ME 4450 Aerospace Propulsion (3)	85 85	5 5	10 10	
Spencer Petersen	PT	*Fall 2020* MET 1500 Mechanical Design Engineering (3) ME 4100 Senior Project I (3) *Spring 2021* ME Senior Project II 4200 (3) MET 3300 Computer Programming Applications of MET (3)	75 75	15 15	10 10	

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.

CRITERION 7. FACILITIES

A. Offices, Classrooms and Laboratories

This section summarizes the program's facilities in terms of their ability to support the attainment of the program educational objectives and student outcomes, and to provide an atmosphere conducive to learning.

1. **Offices**

   The Department of Mechanical Engineering Technology occupies the north end of the Engineering Technology (ET) Building, a two-story building located in the north-central part of the WSU Ogden campus. This area of the ET Building houses faculty offices and the department reception area, classrooms, teaching and research laboratories, project rooms, restrooms, storage areas, and a student lounge. Each faculty offices contain a desk and chairs, bookshelves, file cabinets, whiteboards, and a desktop or laptop computer with dual monitors.

   The department administrative assistant works in the reception area. She has a large work surface and raised counter, file cabinets, a computer with dual monitors, a networked black and white/color copier/scanner. Just off the reception area is a faculty conference room that has a refrigerator, microwave, stove/oven, and a sink. This room also has a computer and a large wall mount monitor. The room has a large table and fifteen chairs for department meetings. Besides this meeting room, other larger meetings and gatherings are held in the Dean's conference room on the first floor of the ET Building. Down the hall and across from the offices is a room where faculty mailboxes, office supplies, storage space, a copy machine, and a fax machine are located.

2. **Classrooms**

   Rooms that are dedicated to lectures only, i.e., rooms that have no laboratory equipment, are described in this section. Laboratories are described in the next section. Lecture rooms are described in Table 7-1. Each of these classrooms is equipped with whiteboards, conference tables, and chairs. Each classroom is also equipped with a networked computer (CD and zip drive), sound system, VCR, and ceiling-mounted projection unit. Standard software on these computers includes Microsoft Word, Excel, PowerPoint, and access to the internet. Other software such as Microsoft Project and MINITAB are installed in several classrooms as needed.

Table 7-1. Classrooms (dedicated lecture rooms)

Room	Description
ET 101	Seating capacity: 28
ET 128	Seating capacity: 77
ET 204	Seating capacity: 32
ET 210	Seating capacity: 30
ET 224	Seating capacity: 32
ET 228	Seating capacity: 40
ET 238	Seating capacity: 24

3. **Laboratories**
   Laboratories are maintained at the department level and are shared with the Manufacturing & System Engineering department. These laboratories are well equipped and maintained. These laboratories include three PC Computer Labs: two with 25 seats each and one with 40 seats, a CAD lab with 20 seats, a CNC lab, a manual machining shop, a casting lab, a welding lab, a sheet metal and heat-treat lab, an automation lab, a fluid power lab, a plastics, and composites lab, a measurement & instrumentation lab, and a material testing lab.

   Additional shop areas are also available for use by students in senior projects. Each lab is equipped with industrial-type equipment in good condition. A list of major instructional and laboratory equipment is shown in Appendix C. Computer laboratories are available to the students from about 8:30 am to 10:00 pm, Monday through Friday, during the fall and spring semesters, including final examination periods.

B. Computing Resources

Weber State University has a well-developed computing and IT infrastructure. Central computing facilities for students, faculty, and staff are closely monitored to ensure that capacity planning meets expected bandwidth needs. Decentralized computing facilities have continued to grow in recent years to the point where over 90 percent of the university's

classrooms and laboratories are equipped with a computer connection to the network and various instructional hardware.

Due to the growing use of laptops with mobile devices, the demand for open student computer laboratories has decreased recently, but WSU still maintains over hundreds of desktop computers in the ET building using Windows. The Stewart Library provides additional computers in a reference laboratory, a commons area, and a circulation desk with laptops for checkout. A virtual laboratory environment allows students to access software from anywhere at any time. This virtual laboratory, consisting of over 70 software applications, is available to all enrolled students/employees at WSU and includes the software that supports the MET program such as Word, Excel, PowerPoint, Minitab, ANSYS, SolidWorks, Python, MATLAB, Simulink, LabVIEW, Adobe Suite, Creo Parametric, and AutoCAD.

Professional technical support staff provides instruction to faculty on the use of technology in the classroom. This instruction often involves the use of software applications that students will be using in their coursework. Training Tracker is an online training program developed to schedule and approve training for faculty and staff in a variety of personal, financial, and professional development topics as well as computing-related subjects. A laboratory is available to faculty and staff to scan photos and slides and to prepare multimedia materials for their courses, publications, and department websites. This laboratory is supported by designers and development experts who can assist faculty and staff in the use of high-end software applications needed to efficiently complete their projects.

C. Guidance

Students in the program are guided in the use of laboratory equipment and computer software by the engineering faculty, who have many years of experience in the use of mechanical/electrical test equipment and engineering software applications. Some of the Mechanical Engineering courses are combined lecture/laboratory courses in which basic test equipment is used.

Faculty guide students in the use of engineering and computing software as it is introduced in the curriculum. As majors progress in the program, they use this equipment on a more frequent basis and progressively learn how to use more functions. By the time students are taking upper-division courses, particularly the senior project, they have become proficient in using all the basic test equipment and software. Faculty teach students how to operate the equipment properly such that their measurements are meaningful. Faculty also teach students how to handle the equipment so that they do not harm themselves or others or damage the equipment or surroundings.

D. Maintenance and Upgrading of Facilities

The program has a course fee system for the periodic replacement of expendable and non-expendable items. Expendable items include supplies that require replacement on a relatively short timeline due to continuous consumption by students. Non-expendable items include test equipment such as hardness tester, microscopes, Charpy tester, and electrical

measurement equipment, including multimeters. Course fees are assessed to students when they register for courses, and the funds generated go into an account that the program uses to replace the equipment as needed. The cost structure of the system accommodates a one-year replacement timeline for expendable items and a five-year replacement timeline for non-expendable items. Course fees also cover the costs for the maintenance of annual software licenses.

Computers in faculty offices and student laboratories are typically replaced/upgraded every three to four years by the college IT staff. These computers are normally funded by a combination of internal and external grants. Each summer, when our facilities experience little or no utilization by students, the IT staff conducts an assessment of the software requirements of faculty and laboratory computers. If upgrades are needed, the IT staff installs them at this time. Summers are also an opportune time to organize and clean laboratories and other areas in the department in preparation for a new academic year. Depending on staffing, this duty may fall on work-study students under the direction of the faculty. Equipment, supplies, and office furniture that have outlived their usefulness are sent to Property Control, where they are offered to other departments on campus or sold to the public.

E. Library Services

The Stewart Library at WSU provides students and faculty with the full range of services expected of any university library, including expert reference assistance and information literacy instruction. Library services are provided at both the Ogden and Davis campuses. Collections include print, electronic, and audio-visual resources as well as access to an increasingly large number of electronic databases, books, and journals. The library contains 459,585 bound volumes, 259 databases, 104,156 print and electronic periodicals, and 14,795 audio-visual works.

An equivalent full-time faculty of 11 plus 32.8 FTE staff provide library services to the WSU community. The library is open 105 hours per week during the fall and spring semesters; reduced hours are in effect during the summer semester and semester breaks. Computers are located throughout the library to facilitate access to resources, and a wireless system affords connectivity for patrons with laptops. Off-campus access to resources and services is available 24/7 through the library's website. During the 2018-2019 academic year, over 13,207 in-person circulation transactions occurred and 19,562 user assistance interactions occurred.

The Department of Mechanical Engineering Technology is supported by a subject librarian that provides expert assistance to students and faculty. The subject librarian is responsible for periodically consulting with faculty to assess instructional and research needs and to develop the collection. The library allocates an annual budget to the department for the purchase of these items.

The electronic catalog is the main tool for finding materials held by the library. Academic Search Premier is the library's primary search tool for finding materials that are not held by

the library. The Inter-Library Loan (ILL) system can then be utilized to obtain the materials promptly. Numerous databases are available through the Stewart Library, including technical databases such as IEEE All-Society Periodical Package and NASA Technical Reports Server. An Electronic Reserve system permits faculty to place course materials and other documents on the reserve such that students can access them online at any time.

F. Overall Comments on Facilities

The WSU's Facilities Management office has overall responsibility for implementing and maintaining the university's chemical hygiene plan. If needed, the facilities Management office also provides guidance to programs on general safety, ergonomics, occupational safety and training, air quality monitoring in lab areas, and hazardous materials and hazardous waste management. Department chairs are responsible for ensuring that the university's safety policies, including the chemical hygiene plan, are implemented, followed, and maintained in their departments.

Engineering Technology (ET) Lab Coordinator is responsible for each of the mechanical engineering technology labs and ensures that these labs are safe for their intended purposes. Faculty members teaching a particular lab are responsible for inspecting and testing the equipment in the labs for safe operation and ordering preventive maintenance and repairs when necessary. The shop supervisors are responsible for ensuring that the tools and equipment in the student shops are safe and properly maintained. Inspections are performed according to recommendations in the manufacturer's operating manuals.

For the safety of the campus community, the WSU police (a state-authorized law enforcement agency) officers and security personnel conduct security checks of buildings after normal building hours. The university has procedures in place (e.g., campus alert system, STAR team) to ensure the safety of students and staff in case of an emergency. The WSU campus alert system called Code Purple (https://weber.edu/codepurple) provides notices about significant emergency situations on campus, such as snow closures, power outages, gas leaks, or other potentially dangerous threats. The Strategic Threat Assessment Team, also known as the STAR team (https://www.weber.edu/SafeAtWeber/STAR.html), is charged with assessing and responding to actual or potential threats of violence of any kind at WSU. In cases of sexual violence, the STAR Team works with the Title IX coordinator, as appropriate, to make recommendations regarding the safety of individuals at WSU.

CRITERION 8. INSTITUTIONAL SUPPORT

A. Leadership

The WSU Mechanical Engineering Technology Program is led by the Mechanical Engineering Department chair Dr. Daniel J. Magda, and the Mechanical Engineering Technology program coordinator, Dr. Randy Hurd. The leadership responsibilities of the chair include, but are not limited to, the following:

- Manage and oversee the programs in the Department of Mechanical Engineering
- Represent the department to outside entities
- Guide the accreditation efforts of the Mechanical Engineering Program
- Manage personnel issues in the department
- Oversee the recruitment, hiring, and evaluation of faculty, adjunct faculty, and staff
- Manage and approve department budgets and expenditures
- Schedule and run regular department meetings
- Schedule regular Industrial Advisory Committee meetings
- Attend department chair meetings in the college
- Oversee and approve teaching assignments
- Oversee the curricula in the department
- Consult with and report to the dean of the college on matters about the department
- Sit on the department promotion and tenure committee
- Foster excellent teaching, scholarship, and service among faculty
- Approve faculty leaves of absence
- Supervise the department administrative assistant
- Oversee scholarships offered by the department

The leadership responsibilities of the MET Program Coordinator include, but are not limited to, the following:

- Advise new and current students in MET
- Guide the MET curriculum
- Schedule MET courses
- Assign instructors for MET courses
- Assist the chair in accreditation activities of the MET Program
- Assist the chair with various duties as required

The department chair and MET program coordinator receive reassigned time of six credit hours and three credit hours, respectively, of load per semester for their leadership duties.

The Dean of the College of Engineering, Applied Science & Technology, Dr. David Ferro, has upper-level administrative oversight of the program. The department chair and program coordinator have direct leadership responsibility and decision-making authority for the Mechanical Engineering Technology program, but all faculty participate to some extent in program oversight. Faculty opinions and suggestions are freely and openly discussed in department meetings. Faculty have input to department curriculum, policies, and practices

and are responsible for and participate in the continuous improvement of the program. Faculty are required to fulfill their teaching, scholarship, and service obligations as part of their academic appointments at the university.

B. Program Budget and Financial Support

1. Budgeting Process

The program budget consists of two main components: 1) salaries and benefits of faculty and staff and 2) operations. Salaries are determined at the time of hire and are allocated by the institution to the various academic divisions. Depending upon state and institutional economic conditions, salaries increase over time with the across-the-board cost of living increases, promotions, special bonuses allocated by the administration, performance-based pay raises, and equity adjustments. Benefits include retirement, medical and dental insurance, life insurance, unemployment insurance, workers' compensation insurance, and long-term disability.

Operations include the maintenance and upgrading of equipment and supplies, faculty development, disbursement of financial aid, and routine office functions and materials. Maintenance and upgrading of equipment and supplies are funded by course fees as well as through grants and special allocations. Faculty development is funded by the department, college, or outside entities. The department typically funds registration fees for conferences, seminars, and professional courses, whereas the college funds travel expenses for these activities. Faculty may pursue external funding for research or projects through the WSU Office of Sponsored Projects. Internal funding is available for faculty development through the Research, Scholarship, and Professional Growth (RS&PG) and Hemingway committees. Routine office functions and materials such as telephones, copy machines, printers, office supplies, advising literature, etc., are covered by the operating budget of the department.

2. Teaching Support

Weber State University is primarily an undergraduate institution. Grading and teaching are done by the program faculty. Faculty are encouraged to participate in the Teaching & Learning Forum, an organization founded by a group of WSU faculty in 1992. The Forum offers retreats, book groups, workshops, collaborative projects, and other initiatives in support of faculty teaching and development. Activities are directed by the Teaching, Learning, and Assessment (TLA) Committee, a standing committee of the WSU Faculty Senate. The Teaching and Learning Forum office is staffed year-round and has a library of books and other materials on teaching and learning. The Forum consists of several learning groups, two of which are particularly applicable to the program: “Technology and Education” and “Issues in Science Education.” Program faculty are also encouraged to attend and participate in conferences sponsored by national societies and groups such as the American Society for Engineering Education (ASEE) and The Teaching Professor.

3. Maintenance and Upgrades

Resources for maintaining and upgrading laboratory equipment are described in Criterion 7, Section D. WSU Facilities Management provides the resources for the broader infrastructures and facilities such as building safety, lighting, power, heating and air-conditioning, water, furnishings, and cleaning. Also, the State of Utah legislature has approved a 60+ million dollar NOORDA Engineering building for WSU. This groundbreaking is set for spring 2020, and the program will be moving into this building by Fall 2022.

4. Adequacy of Resources

The budgets of the institution, college, and department are adequate to facilitate the achievement of the student outcomes. The qualifications and number of faculty, as well as faculty development in support of teaching, are likewise sufficient for the attainment of student outcomes. Finally, the student outcomes are appropriately and adequately supported by the infrastructure, facilities, and equipment used by the program.

C. Staffing

The Mechanical Engineering Technology Program is supported by administrative, instructional, and technical staff. Administrative personnel who have control of the program are the dean of the college and the provost and president, the chief academic officers of the institution. The dean has academic and budgetary oversight over the eight academic units in the college, including the Department of Mechanical Engineering. As discussed in Criterion 6, Sections A and C, the qualifications and number of the instructional staff are adequate to meet the needs of the program.

The IT manager for the college contributes approximately 10 percent of his total workload to the Mechanical Engineering and Mechanical Engineering Technology Program (See Table D-2, Appendix D). He is responsible for upgrading and maintaining faculty, staff, and laboratory computers in the program. He is assisted by IT staff and hourly student employees. His responsibilities do not include the setup, maintenance, and monitoring of laboratory equipment, supplies, and parts.

The university working conditions and benefits are such that staff tends to stay, and there is a very little problem with retaining them. Staff members have numerous opportunities to get additional training, both on campus and through workshops off-campus.

D. Faculty Hiring and Retention

1. Describe the process for the hiring of new faculty.

Hiring new faculty at WSU is a three-step process:

<u>Position approval and advertisement</u>

- Identify a significant instructional need in the program
- Obtain the verbal approval of the dean and provost to hire a new faculty member
- Hiring/screening committee is organized
- Committee prepares the selection criteria and prepares an advertisement
- Requisition, advertisement, and other forms are submitted to Human Resources (HR)
- HR submits the forms to the dean and provost for signatures
- Position is advertised for the appropriate time period
- Committee receives applications and resumes from HR

Screening and interviewing applicants

- Preferences (veteran, diversity and/or internal) are applied
- Committee makes first cut, eliminating applicants who do not meet minimum qualifications
- First cut is approved by the AA/EO Director
- Committee narrows applicant list using numerical ratings based on the selection criteria
- Committee conducts telephone interviews of remaining applicants (around 6 to 8)
- Based on telephone interviews, committee narrows list to 3 or 4 final applicants
- Committee notifies HR of foreign nationals among final applicants
- Final applicants are invited for campus interviews
- Interviews are completed
- Reference checks are completed
- Finalist is selected by the committee with the dean's approval

Selection Approval and Offer

- Name of finalist and ARS rating sheets are submitted to HR
- Finalist is approved by HR and the AA/EO Director
- Background check is conducted
- Employment offer is extended to the finalist by HR or the dean
- HR sends letters to the finalists not selected

2. Describe strategies used to retain current qualified faculty.

Strategies to retain current qualified faculty are, to a great extent, woven into the fabric of the university working environment. The direct and indirect benefits of working at the university are difficult, if not impossible, to match elsewhere. Engineering courses are not typically offered during the summer, so faculty may consult or work in their disciplines on a full-time basis if they wish. Furthermore, WSU has a liberal sabbatical leave policy that provides faculty opportunities to conduct research or pursue other professional endeavors.

The program strives to assign faculty courses that are within their areas of technical expertise. This strategy is not only more satisfying to the faculty member, but students likewise benefit by learning from professors with in-depth knowledge and experience in the subject matter of the course.

Another strategy for retaining current qualified faculty is to abide by institutional policies concerning academic freedom. From the WSU Policies and Procedures Manual (PPM) 9-1: "Weber State University seeks to provide and sustain an environment conducive to sharing, extending and critically examining knowledge and values and to furthering the search for wisdom. Effective performance of these central functions requires that faculty members be free to pursue and teach the truth in accord with appropriate standards of scholarly inquiry."

Also, from PPM 9-1: “Academic freedom in the pursuit and dissemination of knowledge through all media shall be maintained at Weber State University. Such freedom shall be recognized as a right of all members of the faculty whether of tenure or non-tenure status, of all administrative officers and all students.” Other strategies are reflected in the employee benefits and working environment of WSU. Full-time faculty enjoy a wide range of benefits and privileges, including a generous employer retirement contribution, tuition waivers for themselves, spouses and children, on-campus services and activities such as recreation, sporting events and performing arts. Nestled against the western slope of the Rocky Mountains, the WSU community enjoys numerous outdoor recreational activities such as hiking, biking, skiing, snowmobiling, fishing, camping, and hunting.

To incentivize tenured professors who hold the rank of full professor, a program called Performance Compensation Plan (PCP) provides a monetary award for maintaining a level of accomplishment in teaching, scholarship, and service equivalent to promotion to full professor. Tenured faculty are eligible to apply up to two times for the PCP every five years after being promoted to full professor.

E. Support of Faculty Professional Development

The professional development of faculty is integral to the support of faculty scholarship and one of the key expectations of faculty in fulfilling their academic duties and responsibilities. Thus, the professional development of faculty is supported at the department, college, and university levels. The department funds registration fees for seminars, workshops, conferences, and short courses, while the college funds travel expenses. If the faculty member is awarded a grant or contract in support of professional development, funding is provided centrally through the university from the funding agency.

As discussed in Criterion 6, Section D, the institution provides a liberal sabbatical leave program in which faculty can engage in professional development for an extended period of time without having regular teaching and other faculty responsibilities. After achieving tenure, faculty are eligible for a two-semester sabbatical leave at 75 percent of their base salary. After taking that sabbatical leave, faculty accrue a one-semester sabbatical leave after three years of service and a two-semester sabbatical leave after six years of service. For the one-semester and two-semester leaves, faculty are paid 100 percent and 75 percent, respectively, of their base salary. Granting of a sabbatical leave is contingent on the approval of the chair and dean and is subject to existing instructional needs and funding constraints.