Academic Program Review

Program: Mechanical Engineering Technology
A.A.S. and B.S. Programs

2010

Contents

Section 1. Academic Program Review

Yearly Administrative Review **Program: Mechanical Engineering Technology**

Purpose of Administrative Program Review

1. To facilitate a process led by the deans and department heads/chairs to assess and evaluate programs under their supervision

2. To facilitate long term-planning and recommendations to the VPAA.

3. To collect and analyze information that will be useful in the University's accreditation efforts, Academic Program Review deliberation, and assessment.

A. PROGRAM GOALS

1. Mission Statement

The Mechanical Engineering Technology (MET) programs seek to provide a stimulating learning environment to prepare students for the broad array of technical careers associated with the discipline.

2. Program Educational Objectives

AAS MET Early Career Objectives

In the first five years after completion of the AAS MET degree, graduates will be able to:

1. successfully complete a bachelor of science degree in a technical or other discipline
2. and find employment appropriate to the discipline

BS MET Early Career Objectives

In the first five years after completion of the BS MET degree, graduates will be able to:

1. find employment appropriate to the discipline
2. further their education either by pursuing advanced degrees or with continuing education
3. and be able to advance to supervisory or other higher positions

3. Process for Establishing Program Educational Objectives

Faculty took the lead to establish educational objectives for the MET programs. Following the 2003 Technology Accreditation Commission – Accreditation Board for Engineering

and Technology (TAC/ABET) visit, which accredits the program, one faculty member attended the ABET "Workshop on Program Improvement" in Salt Lake City. He also attended the American Society for Engineering Education (ASEE) Conference and heard many papers on continuous improvement. Upon return, a draft of a new Continuous Improvement Plan (CIP) was created. This was reviewed and modified by all faculty. The new Continuous Improvement Plan was presented and discussed at the April 2005 MET Industrial Advisory Board meeting. The CIP, along with initial assessments, were submitted to TAC/ABET in the July 1, 2005 Interim Report. The objectives of the programs were again reviewed by the MET Industrial Advisory Board during its April 23, 2010, meeting.

The results of the current survey (April 23, 2010) are shown in Appendix A. The scores for questions #12 through #14 reflect the findings and concerns by TAC/ABET during its review of the programs in October 2009. These are areas that the faculty has little, if any, control over. Question #5 is one the faculty must address and will be discussed or corrected before the fall 2010 semester.

Discussion of Advisory Board's answers:

Question #5 Student projects are appropriate as a capstone for BS in Met and demonstrate sufficient mastery of the curriculum. 3.67/5.0

> The faculty will discuss this at its meeting in August. Steps will be taken to upgrade the level of student projects.

Question 12. Classrooms used by the Program have adequate instructional technology. 2.67/5.0

> The faculty has little control over the availability of instructional technology. Equipment for several rooms and laboratories has been place on requested equipment list, but faculty has no control over allocation of funds.

Question 13. Labs have adequate tools and materials to provide students with a sufficient hands-on learning experience. 2.67/5.0

> In prior years the allocation of S&E funds and one-time funds has not been sufficient to allow purchase of many pieces of equipment need for the laboratories. The program has been notified that for 2010-2011 year, its S&E funds have been doubled under a new formulation system. The new system takes into account productivity, enrollment gains, etc.

Question 14. The Program has adequate student workspace available for both curricular and extra-curricular student projects. 2.33/5.0

> After the 2005 ABET review, an additional laboratory was provided to the program. It is a model/prototyping laboratory, used for student projects, student competition projects, etc. The program could still use more laboratory space, and has requested it but has not obtained additional space. As an Engineering

Technology program, laboratory space is crucial to teaching students. Unlike a program based on theory, the program is applied science. This only happens in laboratories. The faculty has no control on acquisition of laboratory space.

Questions 12 – 14 were the same concerns expressed by TAC/ABET during its review. The faculty would like more equipment and space, but it is dependent on funds from sources outside its control.

4. Have the goals changed since the last program review? If so, why and how? If not, why not?

The goals have not changed since the last program review. Review of the goals by the faculty and the advisory board has not resulted in any changes as of April 2010.

5. Consistency of the Program Educational Objectives with the Mission of the Institution and the programs.

The University's mission is to prepare students for successful careers, responsible citizenship, and lifelong learning. Through its many partnerships and its career-oriented, broad-based education, Ferris serves our rapidly changing global economy and society.

This is consistent with the mission of the MET programs and the Early Career Objectives stated above. Through the various courses, students are taught the fundamentals of engineering technology which prepares them for employment; but, knowing the essentials of engineering technology does not prepare the students for social and economic factors which they will face in the workplace. Therefore, general education courses can help them prepare for situations they will experience. The faculty, due to vast industrial experience, brings to the classroom every day experiences that the student will encounter. These experiences reinforce thoughts on ethics, diversity and life-long learning.

B. PROGRAM VISIBILITY AND DISTINCTIVENESS

1. Describe any unique features or components of the programs.

The unique feature of the program is the diverse nature of companies that seek out the graduates. Employers from automotive, automotive suppliers, food processors, architectural/engineering firms, manufacturers, military suppliers, oil and gas companies, utilities, etc., have found our students to be especially valuable employees.

Our graduates are able to start with their "feet hitting the ground" from day one. Due to the nature of the programs being "Applied Engineering," the students have considerable hands-on experience from laboratories connected to many courses and the Industrial Internship required of every student. These combine to create a graduate who is prepared to start working from the start.

Employers have told us that our students are well prepared to start right out solving problems on the plant floor. Students from other universities may require additional training before they are ready to start. This is an asset to our programs, as employers are seeking out our students. This has assisted in the recruitment of new students. In the past year, more Fortune 500 companies such as Schlumberger, Siemens, General Motors, Proctor & Gamble, etc., have sought out our students.

The liability of the program is the diverse companies our students work in. As a result, we do not have a particular set of companies that we can approach for funding of our programs. Other programs in the college have a particular industry or series of companies that always hire their students both as interns and full-time employees. This makes it difficult to approach companies for equipment and funding because we do not have particular association, such as Welding Society, Plastic Association, etc. In several cases, program alumni have helped to secure donations to the program. Currently, we have a large donated Robot, but no space to put it in. It sits outside with a tarp over it.

2. Describe and assess the programs' ability to attract quality students.

The table below shows the ACT's of students entering both the Associates and Bachelors programs. The ACT's of the programs generally run higher that the university's composite score.

Mechanical Engineering Technology A.A.S.[1]

Academic Year	Composite ACT		Number of New Students Enrolled	University ACT Composite FTIAC
	MIN.	AVG		
Fall 2009	19	22.13	15	21.1
Fall 2008	19	22.07	27	21.3
Fall 2007	19	22.24	17	21.4

Mechanical Engineering Technology B.S.

Academic Year	Composite ACT		Number of New Students Enrolled
	MIN.	AVG	
Fall 2009			45
Fall 2008	19	22.45	44
Fall 2007	19	24.00	34
Fall 2006	17	20.00	35
Fall 2005	17	22.00	36
Fall 2004	16	21.00	22

For the past several years, the MET program have had the highest number of applications in the College of Engineering Technology and the highest number of admits.

[1] Ferris State University Fact Book 2009/2010

3. Identify the institutions that are the main competitors for prospective students in these programs.

During the spring of 2009, phone calls were made to approximately 60 students who had been admitted but not signed up for orientation to determine if they were planning to attend Ferris in the fall. The results of this confirmed our thoughts as to why students submitted applications but did not attend.

Many students use Ferris as a back-up in case they are not admitted to other universities, such as Michigan State University, Kettering, Grand Valley, etc. Although our programs do not compete directly with these universities, the students apply to Ferris and then see if they are accepted elsewhere before considering our programs. Other Michigan schools offering B.S. programs in Mechanical Engineering Technology include: Michigan Technological University, Wayne State University, Central Michigan University, Eastern Michigan University, and Northern Michigan University. The last four have been added in the last 10-15 years. Delta College and Lawrence Technological University offer an AAS in MET.

The only programs which appear to directly compete with MET is Michigan Technological University (MTU) and Wayne State University. They are the only public universities which have had MET for a long time. MTU is, of course, a great distance from most of Michigan's population and its campus is dominated by its Engineering College. Wayne State's program appears to be more theoretical and little noticed, due to the research nature of Wayne State. The remaining BSMET programs are at traditional teacher's universities and lack technical heritage

It should be noted that several students from MTU have transferred to Ferris. No known students at Ferris have transferred to MTU.

The Ferris State program is highly sought after by industry, as shown at recent job fairs. The MET program is typically the most sought after degree.

4. How are these programs similar and different from the FSU programs?
What can be learned from them that would improve the programs at Ferris?

The programs which students appear to apply to, besides Ferris, are not our competition. These universities are Engineering Degree programs versus our Engineering Technology Programs. Michigan Tech. is the only program that directly competes and the choice there is distance from home and friends.

The program is highly sought after by industry as shown at recent job fairs. The MET program is typically the most sought after degree.

What can be learned is that Ferris is behind in providing quality laboratory space and classroom technology.

C. PROGRAM RELEVANCE.

1. Provide a labor market demand analysis: This activity is designed to assess the marketability of future graduates. Reports from the Department of Labor and from industry are excellent sources for forecasting demand on graduates. Request information from Library Liaison. Check Internet Data.

The Labor Market Review, shown in Appendix B, was conducted by Professor Brian Brady using several sources for information. The survey shows that there is expected to be a need for 88,000 new positions between 2008 and 2018.

The review looked at the traditional positions of graduates of Mechanical Engineering Technology programs, which are considered Mechanical Engineering Technicians/Technologist; however, the majority of our students accept Mechanical Engineering positions. In the past 10 years or more, industry has begun to accept Engineering Technology graduates as Applied Engineers.

The National Commission on Energy Policy developed a Task Force on America's Future Energy Jobs.[2], which states "The United State is facing a critical shortage of trained professionals to maintain the existing and design, build, and operate the future electric power system." The task force found:

By 2013, 11,200 engineers will be needed by the electrical utilities due to retirements.

By 2022 150,000 professional and skilled craft workers will be needed for construction of the new electrical sector.

11,000 employees per year will be required by utilities or other third party managed energy efficiency programs in the United States through 2030.

This information is relevant as a number of our graduates are already working in the electrical generation business. This includes Consumers Energy, DTE Siemens and smaller energy equipment suppliers. Future graduates will also be working in this area.

2. Describe and assess how the programs respond to emerging issues in the discipline, changes in the labor force, changes in employer needs, changes in student needs, and other forces of change. Discussion of feedback from employers and student interns.

The B.S. program has used its meetings with interns and their supervisors, during the summer semester, to provide feedback on course content and course referrals for general education and technical elective courses. From the meetings, supervisors tell us to encourage students to take a foreign language. Companies are operating worldwide and a student with a grasp of a foreign language is a step ahead.

[22] http://www.bipartisanpolicy.org/library/report/task-force-americas-future-energy-jobs 2009

In the technical elective area, companies are pushing into "Lean Manufacturing" and "Ergonomics," etc. Based on this feedback from Internship interviews, we have been encouraging our students to take these types of courses.

3. Assess why students come to FSU for the programs. Summarize the results of the graduate exit survey and the student program evaluation.

From numerous discussions with students and parents, the reason they chose Ferris and the MET program is that first it has a smaller campus and is close to home. If they have visited other campuses, the facilities do not empress them. Another factor is that our students are getting employment and companies contact us looking for our students. Obviously in today's market, its important that the student has a chance for employment when they finish.

a. How well do the programs meet student expectations?

Annual survey of seniors graduating from program, which does not have the data compiled yet.

b. How is student sentiment measured?

Annual survey of seniors graduating from program, which does not have the data compiled yet.

D. PROGRAM VALUE

1. Describe the benefit of the programs, facilities, and personnel to the University.

The benefits to the university from these programs exceed those of most programs. A university can function to develop graduates, but as people in industry have said, "You have a degree, so do 1,000 other students. What did you do and what position did you have in activities outside the classroom."

Industry is not looking for just a graduate with a degree, but a graduate with a degree and some experience in working with other people in a competition or organization outside of the classroom. Our programs have provided this by being the main force behind the Rube Goldberg Machine Competition, SAE Formula Car Competition, ASME Human Powered Vehicle Competition, and involving our students in SAE Baja Car Competition. In addition, the Mechanical Engineering Technology Association (META) conducts many public service projects and involves students in trips, picnics and recreational projects. Also, the ASME Student Chapter works with META to put on trips, annual golf outing and other events during the year.

The programs offer students many opportunities to become involved. These also provide exposure for the university throughout the world. This was proven when the College of Engineering Technology's Rube Goldberg Team was contacted by a Japanese TV production company and flown to Japan (all expenses paid) to set a new world record. No other university has had that kind of experience or exposure.

***2. Describe the benefit of the program facilities and personnel to the students enrolled in the** programs.*

The students have the benefit of a faculty that is concerned about their success both inside and outside the classroom. As faculty we address their academic concerns and assist with directing them with personal problems affecting their course work.

Outside the classroom, we try to provide projects and competitions that show them how to work together and succeed. The student organization which the faculty supports provides opportunities to visit trade shows and industries around the Mid-West.

The facilities provide a place for students to work on programs such as the Human Power Vehicle and Formula Car competitions. These types of projects are important for student growth and as additions to their resumes.

3. What is the assessment of program personnel of the value of the programs to employers? Explain how is this value is determined.

The recent survey of the Industrial Advisory Board (April 2010) asked their opinion of the faculty (scale 1 to 5, with 5 strongly agree).

Program faculty have sufficient academic credentials	4.50
Program faculty have adequate industrial experience	4.83
Program faculty have adequate extra-curricular involvement with students	4.83
The Program has adequate leadership	4.83

The survey shows that the Industrial Advisory Board is very satisfied with the faculty.

4. Describe the benefit of the programs, faculty, staff and facilities to entities external to the** University (services that faculty have provided to accreditation bodies, and regional, state, and national professional associations; manuscript reviewing; service on editorial boards; use of facilities for meetings, etc.**).

Faculty has or do participate in:

American Society of Engineering Education, Member
Fluid Power Society, Member
Great Lakes Renewable Energy Association, Member
Society of Automotive Engineers, Member, Student Chapter and Formula Car Advisor
Acoustical Society of America, Member
American Solar Energy Society, Member, former chapter leader
Michigan Society of Professional Engineers, Big Rapids Chapter, Member
MathCounts Coordinator, 2000 to present
American Society of Mechanical Engineers, Member, Chapter Advisor,
Human Powered Vehicle Advisor
Ferris State University's Energy Conference. Planning committee, attendee.

Advisor and coordinator for Regional and National Rube Goldberg Machine High School and university competitions

The faculty of the programs participates in a wide variety of associations and professional organizations. This participation provides contacts for speakers in the classroom and allows the faculty to maintain skills in their professions. This is important for the students and provides them with additional viewpoints and expertise in the classroom.

5. What services for extra-university general public groups (e.g., presentations in schools or to community organizations) have faculty, staff or students provided? Describe how these services benefit students, program, and community.

Rube Goldberg hosts regional and national competitions and includes local high schools

Formula SAE has presented to a local service club and assisted them with a fund-raiser

MATHCOUNTS brings in over 70 local middle-school students plus teachers and parents each year

FSU's Spaghetti Bridge contest brings in high school teams from across the state each spring

Provide activities for technology related summer camps that bring in potential students in.

Presentations to the College of Education's summer Educator's Academy for primarily high school teachers

Section 2: Collection of Perceptions

The survey sections must include, among others, a discussion of techniques used in collecting the information, difficulties encountered during the surveying process, number and percent of respondents, and analysis of data in accordance with established methodologies. The survey instruments must be designed and distributed, in consultation with Institutional Research and Testing, to reflect general aspects of program review as well as the specific nature of the programs itself. All comments should be included, but the names of individuals mentioned should be deleted.

A. GRADUATE FOLLOW-UP SURVEY:

The purpose of this activity is to learn from the graduates their perceptions and experiences regarding employment based on program outcomes. The goal is to assess the effectiveness of the program in terms of job placement and preparedness of the graduate for the marketplace. A mailed or e-mailed questionnaire is most preferred; however, under certain conditions telephone or personal interviews can be used to gather the data.

Data from Universities Graduate Follow-up Survey Summary

	Degrees		Responded	% Response	#Employed	Placement Rate	Avg. Salary
Year	AAS	BS					
2005/2006	31	18	27	55%	49	100%	$40,970
2006/2007	21	25	17	37%	16	94%	$42,367

B. EMPLOYER FOLLOW-UP SURVEY:

This activity is intended to aid in assessing the employers' experiences with graduates and their perceptions of the programs. A mailed or e-mailed instrument should be used to conduct the survey; however, if justified, telephone or personal interviews may suffice.

Not available

C. GRADUATING STUDENT EXIT SURVEY:

Graduating students are surveyed every year on an ongoing basis to obtain information regarding quality of instruction, relevance of courses, and satisfaction with program outcomes based on their own expectations. The survey must seek student suggestions on ways to improve the effectiveness of the programs and to enhance the fulfillment of their expectations. This survey is mandatory for all program graduates.

Data is not available yet.

D. STUDENT PROGRAM E VALUATION:

Current students are surveyed to obtain information regarding quality of instruction, relevance of courses, and satisfaction with program outcomes based on their own expectations. The survey must seek student suggestions on ways to improve the

effectiveness of the programs and to enhance the fulfillment of their expectations. This survey should be conducted during the year before the PRP report is submitted.

Data is not available yet.

E. FACULTY PERCEPTIONS:

The purpose of this activity is to assess faculty perceptions regarding the following aspects of the programs: curriculum, resources, admissions standards, degree of commitment by the administration, processes and procedures used, and their overall feelings. Additional items that may be unique to the program can be incorporated in this survey.

Data is not available yet.

F. ADVISORY COMMITTEE PERCEPTIONS:

The purpose of this survey is to obtain information from the members of the program advisory committee regarding the curriculum, outcomes, facilities, equipment, graduates, micro- and mega-trends that might affect job placement (both positively and adversely), and other relevant information. Recommendations for improvement must be sought from this group. In the event that a program does not have an advisory committee, a group of individuals may be identified to serve in that capacity on a temporary basis.

See Appendix A., **Survey of Industrial Advisory Board at April 23, 2010, Meeting**

The programs' Advisory Board generally believes the programs are on the right track with regard to the specific course work and skills required to meet the needs of industry. Where the board believes the programs fall short are:

1. Laboratory space
2. Adequate tools in the classroom and labs

Points 1 and 2, these have been cited in prior APR reports and also by TAC/ABET during its last two program reviews. The programs did receive use of SWAN 219 in 2006, which increased space for students to work on projects. The programs could use additional laboratory space and equipment. Perkins funds were obtained to buy additional and replacement equipment; however, a considerable amount of the existing equipment is still older and not up to date with current industry standards.

The faculty has little control over allocation of space or funds to address the Advisory Board concerns. This is up to the administration.

Section 3: Program Profile:

A. PROFILE OF STUDENTS. (combined AAS & BS degrees)[3]

1)	Student Demographic Profile.						
			2005	2006	2007	2008	2009
a)	Gender						
		Male	106	90	91	114	116
		Female	4	4	5	3	5
			110	94	96	117	121
	Race						
		Unknown	4	4	1	0	0
		Black	4	2	4	4	5
		Hispanic	0	1	1	2	3
		Indian/Alaskan	1	1	0	0	0
		Asian/Pac Islander	0	1	2	5	3
		White	98	82	87	105	109
		Foreign	3	3	1	1	1
		total	110	94	96	117	121
b)	Residency						
		In-State	104	90	93	112	116
		Out-State	6	4	2	5	5
		total	110	94	95	117	121
c)	Full Time/Part Time						
		Full Time	106	84	91	111	113
		Part Time	4	10	5	6	8
		total	110	94	96	117	121
d)	Attend Classes during Day/evening/weekends						
		All classes are conducted during the time of 8:00 AM until 9:50 PM					
		Monday through Friday.					
e)	Enrolled in classes on/off Campus						
		All classes in the program are only offered on-campus, except for					
		MECH 340 Static & Strength of Materials, which a service course offered					
		in Grand Rapids					
f)	Enrolled in 100% on-line and/or mixed delivery						
		All classes are face to face. Mixed delivery was tried in some courses					

[3] Ferris State University, Institutional Research and Testing

1. ***Discuss how the information presented in (a) through (f) impacts the curriculum, scheduling, and/or delivery methods in the programs.***

The programs are made up of mostly white males from Michigan that attends classes full time on the Big Rapids campus. We have made efforts in the past few years to recruit females to the programs. We also use information from National Institute for Women in Trades, Technology and Science, web site. We're often told by industry that women see problems and projects from another viewpoint and that is what is needed in today's market. We will continue our efforts to recruit women.

We expect that there will be more out-of-state students with the addition of the larger area now open to in-state tuition. We are seeing some students from California and other states, but our main drawing area is Michigan.

Due to the nature of many of our courses being laboratory orientated, on-line courses do not work well today. Future technology may help this. We have tried some mixed delivery courses without success. Students did not like the on-line portion of the course.

Our course scheduling depends on instructor and room availability. We do get inquires for more evening classes, but are already offering many classes and labs in the evening due to scheduling issues.

2. ***Quality of Students.***

a.) What is the range and average GPA of all students currently enrolled in the programs? ACT? Comment on this data.

Currently Enrolled As of Spring Term	2010.	2009	2008	2007
AAS Degree GPA Avg.	2.79	2.62	2.58	2.73
Max	3.97	3.97	3.90	3.97
Min	1.38	1.27	.42	.95
BS Degree GPA Avg.	2.92	2.93	3.03	3.16
Max	3.90	3.90	3.83	3.84
Min	1.20	0.32	1.81	2.29

Overall, the GPA's of the students in the programs have been fairly constant. The minimums have varied, but the data includes students who may have been expelled or put on probation at the end of the spring term which would affect the data.

Data from Admissions Office for students in programs is below:

Student Profile		2005	2006	2007	2008	2009
AAS Degree	Avg. FSU GPA /Avg. ACT	2.74 21.23	2.72 21.23	2.73 21.65	2.62 21.53	2.59 21.33
Pre-AAS	Avg. FSU GPA /Avg. ACT	3.86 15.75	2.65 18.00	2.87 17.00	2.44 18.80	2.51 17.83
BS Degree	Avg. FSU GPA/Avg. ACT	3.19 21.88	3.02 21.50	3.03 21.08	3.06 21.63	2.99 22.08
Pre-BS	Avg. FSU GPA/Avg. ACT	2.84 20.80	3.14 16.00	2.91 19.67	2.98 21.00	2.14 18.00

It appears that students' GPA's are dropping, while ACT's are increasing. It seems to indicate that either the faculty is grading on a harder scale or that students are not putting effort into their grades, or ACT's are being inflated. In any case, it warrants a review by the faculty to determine if there is an issue that can be addressed.[4]

b.) What are the range and average GPA's of students graduating from the programs? ACT? Comment on this data.

Graduates As of Spring Term	2010.	2009	2008	2007	2006	2005
BS Degree GPA Avg.	3.08	3.13	3.22	3.25	3.39	3.55
Max	3.90	3.75	3.56	3.83	3.932	3.865
Min	2.25	2.74	2.8	2.71	2.239	2.692
Average ACT		20.00	22.00	21.56	24.11	24.33
Min ACT		16	19	17	16	21
Max ACT		23	24	33	31	29

past 4 y

From Institutional Research and Testing

The program has excellent students.

c.) In addition to ACT and GPA, identify and evaluate measures that are used to assess the quality of students entering the programs.

The programs work well for students that enjoy solving problems and working with their hands. This criterion is not always the case, but it is a question often asked of incoming students who are looking at various programs.

[4] Ferris State University, Institutional Research and Testing

d.) Identify academic awards (e.g., scholarships or fellowships) students in the programs have earned. Comment on the significance of these awards to the programs and students.

We have students in the national engineering technology honorary Tau Alpha Pi. These include nearly all of those who have been admitted that have been FTIACs at Ferris; and nearly all Tau Alpha Pi admits are transfer students who have taken courses that tend to "ruin" GPAs (calculus, etc.) at a previous school.

We have had a number of students in the Honors Program over the past 10 years and several students have won scholarships.

3. What scholarly/creative activities (e.g., symposium presentations, other presentations or awards) have students in the programs participated in? Comment on the significance of these activities to the programs and students.

SAE Formula Car International Competition – 5 years

ASME Human Powered Vehicle National Competition – 2 yrs.

SAE Baja Car Competition – 3 yrs

Rube Goldberg National Machine Competition – 7 yrs
1st place in 2007

Team went to Tokyo, Japan January 2010 and set new Guinness World Record.

Ferris has been asked to hold 2011 National High School competition.

The above competitions provide a tremendous opportunity to develop students' engineering skills. At the same time, students can compete against major universities which helps build their self confidence and assurance that the education they receive at Ferris is comparable to other universities. In these competitions, the students compete against major universities from around the US and Internationally.

4. What are other accomplishments of students in the program? Comment on the significance of these accomplishments to the program and students.

The META and ASME student associations have:

Won 1st place in the Homecoming Float competition for last 10 years
Conducted "Adopt the Highway" clean-ups for over 17 years
Provide trips to numerous companies, trade shows, test facilities and National Laboratories.

5. Employability of students.

How many graduates have become employed full time in the field within one year of receiving their degree? Comment on this data.

Mechanical Engineering Technology AAS program Graduates

Numerical Identifier	Year Matriculated	Year Graduated	Certification/ Licensure (If Applicable)	Initial or Current Employment/ Job Title/ Other Placement
1	200508	200808		ARAMCO, Saudi Arabia, Inventory Reconciler II
2	200408	200901		BS MET
3	200608	200801		BS MET
4	200508	200808		BS MET
5	200608	200808		BS MET
6	200608	200801		BS MET
7	200608	200808		BS MET
8	200608	200801		BS MET
9	200508	200801		BS MET
10	200608	200801		BS MET
11	200308	200801		BS Computer Information Systems
12	200708	200901		BS MET
13	200608	200808		BS MET
14	200608	200801		BS MET
15	200608	200808		BS MET
16	200708	200901		BS MET
17	200608	200801		BS Product Design
18	200608	200801		BS MET
19	200805	200901		BS Manufacturing
20	200508	200801		BS MET
21	200608	200901		BS MET
22	200608	200801		BS MET
23	200708	200808		BS MET
24	200508	200801		BS MET
25	200708	200901		BS MET
26	200608	200801		BS MET
27	200608	200708		BS MET

Mechanical Engineering Technology BS program Graduates[5]

[5] Graduate Survey for 2009 ABET report.

Numerical Identifier	Year Matriculated	Year Graduated	Certification/ Licensure (If Applicable)	Initial or Current Employment/ Job Title/ Other Placement
1	200601	200801		Design Engineer, General Dynamics Land Systems, Muskegon, MI
2	200708	200901		seeking employment
3	200608	200708		Team Leader/Manufacturing Process Technician, Gentex Corporation
4	200708	200901		Marine Corps OCS
5	200805	200808		Field Service Engineer, Seimens Energy, Florida
6	200801	200801		Manufacturing Engineer, Delphi, Saginaw, Michigan
7	200801	200901		Haworth Inc temporarily in production
8	200801	200801		CAE Engineer, Honda Motors R & D
9	200708	200901		seeking employment
10	200708	200901		seeking employment
11	200608	200801		
12	200708	200901		seeking employment
13	200808	200901		Eyelet Tool & Diemaker Apprentice Transmatic, Holland, MI
14	200801	200801		Test Engineer, Fuel Systems, Honda R & D
15	200808	200808		Reserve call-up for 6-months; seeking employment
16	200608	200708		Chassis Engineer, Roush Industries
17	200801	200801		Group Leader-Manufacturing Support Engineer, Gentex Corporation
18	200708	200901		seeking employment
19	200808	200808		Electric System Owner/ Electrical Circuit Technician, Consumers Energy
20	200801	200801		Naval ship retrofit engineer, Northrop-Grumann, Norfolk, VA
21	200408	200708		
22	200708	200901		Associate Mechanical Engineer, BAE Systems
23	200708	200901		seeking employment
24	200708	200801		Gentex, Zeeland, MI title unknown
25	200801	200808	passed FE exam spring 2009	Project Estimator/Designer, Northwest Mechanical Design, Grand Rapids

Of the last 27 graduates of the Associates Degree, 1 returned home for re-employment overseas and 3 students switched programs. The remainder continued on to a BS Degree.

Of the last 27 graduates of the MET BS degree, 4 were seeking employment. Prior to the economic crisis in 2008, the employment rate was closer to 100%.

6. What is the average starting salary of graduates who become employed full time in the field since inception (for new programs) or the last program review? Compare with regional and national trends.

In recent surveys, graduates have not responded with their starting salaries. Indications from graduates through informal discussions show starting salaries average about $55,000 which is comparable to the national average found in the report prepared by Prof. Brady in Appendix B.

7. How many graduates have become employed as part-time or temporary workers in the field within one year of receiving their degree? Comment on this data.

Until the economy crisis in 2008, 100% of the graduates were finding positions. A recent survey found that 12.5 % of those responding were seeking employment.

8. Describe the career assistance available to the students. What is student perception of career assistance?

Graduate survey information for 2007 & 2008 were separated by departments; therefore, data for the MET programs was combined with CAD Drafting & Tool Design and Product Design. For 2009, the data was separated by programs. The response for 2007 and 2008 say only 26% of the students used the Career Guidance Center. None of the 2009 graduates who responded used the services.[6]

Most graduates tend to find positions from internships on-line and word of mouth.

9. How many graduates continue to be employed in the field? Comment on this data.

No data available. A graduate survey by the College of Engineering Technology only had three MET students, which does not provide an adequate sample size.

10. Describe and comment on the geographic distribution of employed graduates.

Many graduates have stayed in the West Michigan area, particularly the Grand Rapids – Holland corridor. Some have left the state for Virginia, California, and Wisconsin. Surveys in 2007 – 09 showed that students were willing to move, although many would like to remain in West Michigan.

[6] Data collected from Graduate survey conducted by College of Engineering Technology, N:\CET\ASSESSMENT & ACCREDITATION\Graduate Survey

11. How many students and/or graduates go on for additional educational training? (Give annual average.) Comment on this data.

In recent years, several students have attended graduate school, either at Michigan Technological University, University of Wisconsin or Ferris State University, Grand Valley State University, Lawrence Technological University, Western Michigan University

12. Where do most students and/or graduates obtain their additional educational training? Comment on this data.

See 11. above.

B. ENROLLMENT.

1. What is the anticipated fall enrollment for the programs?

FALL 2010 Enrollment	2010	2009	2008	2007	2006*
Continuing	72	70	54	41	96
FTIAC	15	19	32	21	1
Internal Transfer	15	18	22	18	
Readmits	5	5	1	5	
Transfer from other schools	5	12	8	11	
Total	112	124	117	96	97
Total Admits	171	187	206	153	168
Percent Admits	65%	66%	57%	62%	57%

As of August 2, 2010, we have 112 students registered for fall 2010 for the programs; considering that several students will register late. This is consistent with previous years as shown in the Table above. The program consistently receives a significant number of internal transfers each year.

*Note – Data in Banner shows all students as continuing, except 1 FTIAC. Data cannot be trusted.

2. Have enrollment and student credit hour production (SCH) increased or decreased since the last program review? Supply a table and comment on any enrollment trends.

	2005	2006	2007	2008	2009
Enrollment	110	94	96	117	121
Student Credit Hour	1610	1402	1404	1488	769
Full Time Equated Faculty	3.36	3.01	3.52	3.55	1.66
SCH/FTEF	478.84	466.04	399.22	419.32	464.04
Average SCH/FTEF for College					353.05

Note: 2009 data only includes fall 2009 data. Average for four previous years is 720 SCH, which would give a total for 2009 of 1497 SCH.

The data shows overall increased enrollment with a dip in 2006 and 2007. Student credit hours have dropped, as a number of service courses offered by the programs have decreased while programs try to meet the 128 credit hour total for a program. As an example, one program dropped MECH 340-Statics & Strength of Materials (4 credits) for MECH 250-Fluid Power with controls (2 credits). The same numbers of students are being taught, but only two (2) credit hours.

3. Since the last program review, how many students apply to the programs annually?

Applicants for the programs where:

2006 - 168
2007 - 153
2008 – 206
2009 – 187
2010 - 171

The MET Associate degree consistently had one of the highest numbers of applications in the college.

4. Of those who apply, how many and what percentage are admitted?

Approximately 75%, from past reviews of data.

5. Of those who are admitted, how many and what percentage enroll?

Approximately 61% (SEE Table above)

The MET program is a backup for many students who apply to Michigan State, Kettering, Grand Valley State, etc. If the student is not accepted, then our program becomes a fall back. This was confirmed last year during a phone campaign of students who had applied but not registered. This is interesting, because our program does not compete with these universities. Their programs are completely different.

6. What are the programs' current enrollment goals, strategy, and efforts to maintain/increase/decrease the number of students in the programs? Please explain.

The programs have sold themselves on word-of-mouth. With the change in the economy, the programs are looking to develop a marketing strategy that focuses on West Michigan, where the majority of our students come from.

C. PROGRAM CAPACITY

What is the appropriate programs' enrollment capacity, given the available faculty, physical resources, funding, accreditation requirements, state and federal regulations, and other factors? Which of these items limit programs' enrollment capacity? Please explain any difference between capacity and current enrollment.

The current program capacity is set at 50 freshmen.

The current capacity of the programs is limited by laboratory space and available time. Labs are used for multiple courses and it is difficult to schedule them. We try to limit laboratories to 12 or 16 students due to equipment and space available. One lecture may have two or more labs associated with it.

The programs are also limited by the number of faculty. For the past several years, under loaded faculty from other programs have been used to supplement teaching loads. Currently, there are four faculty members associated with the programs. In 2009/10, one member was Interim School Director and only taught one class; effective 2010/11, this faculty will be teaching a 50% load.

It is the limits of space and faculty which limits the size of the programs.

D. RETENTION AND GRADUATION

1. Give the annual attrition rate (number and percent of students) in the programs.

	2005	2006	2007	2008	2009
Enrollment	110	94	96	117	121
Enrolled AAS program	83	67	58	62	73
AAS degrees conferred	17	31	21	15	13
Enrolled in BS program	45	43	35	34	44
BS degrees conferred	16	18	25	13	18
% Receiving Degrees	30%	52%	48%	24%	26%

Data cannot be obtained from university records prior to 2009. Prior to this date, the MET programs were part of the Mechanical Design Department which included MET, Product Design Engineering Technology, and CAD Drafting & Tool Design. This data is tainted by

the addition of the other programs. Fall 2009, the data for the MET programs became separate under the School of Computer, Electrical, Mechanical, Energy and Surveying Systems. This will separate out the data from the other programs. This had been previously requested.

2. What are the programs' current goals, strategy and efforts to retain students in the programs?

The faculty believes that retaining students depends on their involvement with the students, both in the classroom and outside. This is why the faculty have started a number of projects such as student organizations: META; ASME, Formula SAE Car Competition, Rube Goldberg Machine, and Human Powered Vehicle Competition to provide outside-the-classroom involvement with the students. The Formula SAE Car has turned into a class for students as an elective.

3. Describe and assess trends in number of degrees awarded in the programs.

The number of degrees granted in the MET BS program has remained relatively constant at about 18 students. Assuming approximately 25-30 students entering the program, we have 18 graduates; 60 to 70% of the students complete the degree.

No conclusions can be drawn from the AAS degree numbers, as many students who are going on for their BS do not fill out the application. Faculty members counsel every student to fill out the forms for their AAS degree, but are not always successful, so numbers do not reflect the actual counts. Many students did have their paperwork corrected in June and July of this year.

4. How many students who enroll in the programs graduate from it within the prescribed time? Comment on any trends.

	2005	2006	2007	2008	2009
Enrollment	110	94	96	117	121
Enrolled AAS program	83	67	58	62	73
AAS degrees conferred	17	31	21	15	13
% Receiving Degrees	20.5%	46.3%	36.2%	24.2%	17.8%
Enrolled in BS program	45	43	35	34	44
BS degrees conferred	16	18	25	13	18
% Receiving Degrees	30%	52%	48%	24%	26%

Mechanical Design De

Data is not available for the MET Programs. Prior to 2009/2010, Met was part of the Mechanical Design Department. This department included Cad Drafting & Tool Design, a two-year AAS program, and Product Design Engineering Technology, a two-year BS degree program. So when data is reported by Institutional Research & Testing, it is for the department not the program. The data then has a two-year AAS, two-year BS and MET AAS and BS programs included. This should be corrected with the creation of the new school within the College of Engineering Technology that has MET as one of its programs.

The data above does not provide a fair view of the program, as the number of transfer students has increased over the past few years. Many of the transfer students are classified as AAS students as they do not have several program core courses when they apply. Within a year they may become BS level students, so numbers do not reflect actual standing of students.

5. On average, how long does it take a student to graduate from the programs? Please comment.

Students typically graduate in four to four and one half years, unless they get out of sequence on pre-requisites for major courses. This is only best guess, as data is not available as discussed in D.4 above. It is based on observation of students known to graduate in the appropriate time.

One item that has always affected graduation time frames is calculus. The math course is a pre-requisite for many core courses. If a student has to repeat it, they are out of sequence for other courses. The ability to pass calculus is a problem in all engineering and engineering technology programs across the country. As with many other universities, we are working with the Math Department to try to address this issue. Several meetings have been held and further discussion is expected.

E. ACCESS

1. Describe and assess the programs' actions to make it accessible to students. Use examples such as off-site courses, accelerated courses or other types of flexible learning, use of summer courses, multiple program entry points, e-learning, mixed delivery courses, scheduling.

Mixed delivery has been tried with mixed success.

All courses in the major are only offered at the Big Rapids main campus. No classes are offered on-line or in the summer. MECH 340 is offered in Grand Rapids during certain years as a service course to the Product Design Engineering Technology program.

2. Discuss what effects the actions described in (1) have had on the programs. Use examples such as program visibility, market share, enrollment, and faculty load, computer and other resources.

There does not appear to be any effect on the programs. The faculty members have been asked to offer the program in Grand Rapids, but there are no laboratory facilities to support the courses.

3. How do the actions described in (1) advance or hinder program goals and priorities?

They have little or no effect.

F. CURRICULUM.

The curriculum review section must also contain appropriate check sheets and example syllabi, which may be attached as an appendix.

1. Program requirements. Describe and assess the program-related courses required for graduation. As part of the graduation requirements of the current programs, list directed electives and directed General Education courses. Provide the rationale for these selections. Indicate any hidden prerequisites (instances where, in order to take a program-required course, the student has to take an additional course. Do not include extra courses taken for remedial purposes).

See check sheet in Appendix C and example syllabi in Appendix D.

2. Has the program been significantly revised since the last review, and if so, how*?*

The programs have not changed significantly in terms of courses and content of the major courses. In many cases, courses that were used in other programs (i.e., Product Design) were redesigned to become MET courses.

- MECH 499, Senior Project, changed from PDET 499
- A computer course elective has been changed to MECH 322, computer Applications for MET 2
- MECH 221 changed to MECH 322, Need for course sequencing and credit hour adjustments

3. Are there any curricular or program changes currently in the review process? If so, what are they*?*

No

4. Are there plans to revise the current programs within the next three to five years? If so, what plans are envisioned and why?

None at this time

G. QUALITY OF INSTRUCTION

1. Discuss student and alumni perceptions of the quality of instruction.

Study by Institutional Research only had three students. It is difficult to draw conclusions from a small sample of approximately 559 graduates.

Annual Graduate Survey is being compiled and data is not yet available.

2. ***Discuss advisory committee and employer perceptions of the quality of instruction.***

The survey of the advisory board, as shown in the Appendix, rated the faculty at 96.6% when asked if faculty had sufficient academic credentials. The faculty was rated at 90% for its industrial experience. The program was rated at 96.6% when asked if the MET program provides education and training essential to many industries, both in and out of Michigan.

3. What departmental and individual efforts have been made to improve the learning environment, add and use appropriate technology, train and increase the number of undergraduate and graduate assistants, etc.?

The use of Ferris Connect has been tried in several courses with mixed success. In MECH 250, the students indicated that they preferred face-to-face instruction. In other courses, Ferris Connect was used to post notes, homework, etc.

Faculty has attended FTLC sessions on Skype and other technologies to incorporate into certain courses.

Programs do not have any undergraduate or graduate assistants.

Swan 304 was updated with a modern teaching station for fall 2008. This is the first lecture room so equipped that is readily available to MET faculty. Faculty are using more digital media and even making hand-written "board notes" available.

4. Describe the types of professional development faculty participated in, in efforts to enhance the learning environment (e.g. Writing across the Curriculum; Center for Teaching and Learning, etc.):

The faculty has used the services of the Center for Teaching and Learning many times for various courses such as Ferris Connect, Grant Writing, Skype, etc. This continues to be an excellent source for new skills and updating old skills.

5. What efforts have been made to increase the interaction of students with faculty and peers? Include such items as developmental activities, seminars, workshops, guest lectures, special events, and student participation in the Honors Program Symposium.

See A.2.d) & 3, above (same questions)

6. Discuss the extent to which current research and practice regarding inclusive pedagogy and curriculum infuse teaching and learning in this program.

What?

7. What effects have actions described in (5) and (6) had on the quality of teaching and learning in the program?

The faculty would like to believe that the quality of the program has increased over the past five years. That's not to say more improvement could not take place. There is always room for change, particularly as the students entering the program are changing.

This can be seen in the course changes in computer and drafting courses. Students are entering with more skills and instructors are adapting the course work. More changes are expected from use of skills provided by the Faculty Teaching and Learning Center to teach with different styles of technology.

H. COMPOSITION AND QUALITY OF FACULTY. Describe and assess the composition of the faculty teaching courses in the programs.

1. List the names of all tenured and tenure-track faculty.

a) Identify their rank and qualifications.
b) Indicate the number of promotions or merit awards received by program faculty since the last program review.

See Appendix F. for faculty vita

Table. Faculty Analysis

Mechanical Engineering Technology B.S. and AAS programs

Name	Rank	Type of Academic Appointment TT, T, NTT	F T or P T	Degrees	Institution from which Degrees Earned & Year	Years of Experience			Professional Registration/ Certification	Level of Activity (high, med, low, none) in:		
						Govt./Industry Practice	Teaching	This Institution		Professional Society	Professional Development	Work in Industry
Thomas Hollen	Assoc. Prof.	T	FT	MS	B.S. Automotive Engineering Technology, Western Michigan State University, 1968 M.S. Mechanical Engineering technology, Western Michigan University, 1971	28	14	12.5	Michigan	High	High	High
Chuck Drake	Prof.	T	FT	MS	B.S. Mathematics, Lake Superior State College, 1974 M.S., Mechanical Engineering, Michigan Technological University, 1992	15	22	19	Michigan and Virginia	High	Med	High
Randy Stein	Assoc. Prof.	T	FT	MS	B.S. Mechanical Engineering, Mechanical Engineering, Michigan Technological University, 1974 M.S. Mechanical Engineering, Mechanical Engineering, Michigan Technological University, 1981	4	19	12		Low	Low	Low
Brian Brady	Assist. Prof.	TT	FT	MS	B.S. Mechanical Engineering, Kettering University, 1990 M.S. Mechanical Engineering, University of Illinois, 1991	15	4	4		Med	Med	Med
						58	52	47.5				

2., Indicate the number of promotions or merit awards received by program faculty since the last program review.

Thomas Hollen to Associate Professor, 2006
Randy Stein to Associate Professor, 2005
Chuck Drake, Merit award, 2007

3. Summarize the professional activities of program faculty since inception or the last program review (attendance at professional meetings, poster or platform presentations, responsibilities in professional organizations, etc.).

Faculty have or do participate in:

American Society of Engineering Education, Member
Fluid Power Society, Member
Great Lakes Renewable Energy Association, Member
Society of Automotive Engineers, Member, Student Chapter and Formula Car Advisor
Acoustical Society of America, Member
American Solar Energy Society, Member, former chapter leader
Michigan Society of Professional Engineers, Big Rapids Chapter, Member
Math Counts Coordinator, 2000 to present
American Society of Mechanical Engineers, Member, Chapter Advisor,
Human Powered Vehicle Advisor
Ferris State University's Energy Conference. Planning committee, attendee.
Advisor and coordinator for Regional and National Rube Goldberg Machine High School and university competitions

The faculty of the programs participates in a wide variety of associations and professional organizations. This participation provides contacts for speakers in the classroom and allows the faculty to maintain skills in their professions. This is important for the students and provides them with additional viewpoints and expertise in the classroom.

I. WORKLOAD

1. What is the normal, annualized teaching load in the programs? Indicate the basis of what determines a "normal" load. On a semester-by-semester basis, how many faculty have accepted an overload assignment?

Faculty full load is considered 24 credit hours or 36 contact hours.

During the past year, all faculties have been on overload. Efforts have been made to avoid this for the coming year.

MET Faculty Workload Summary

	Range	Average
Credit Hours	10 - 29	24
Contact Hours per Week	11 - 40	36
Laboratory Size	11 - 16 1	4
Class Size	15-32	23.5
Advisees	21 - 28	24.25

The faculty is normally right at full load, with an occasional overload.

2. List the activities for which faculty receive release time.

Before the college was reorganized, the department chairman received 75% release time. At one time or another, three of the faculty members were Department Chairs. With the reorganization, a program coordinator (faculty member) will receive 25% release time.

3. Recruitment.

The program has done very little recruiting. Majority of students learn about the program by word of mouth.

a) What is the normal recruiting process for new faculty?

Use Human Resources procedures

b) What qualifications (academic and experiential) are typically required for new faculty?

Masters Degree, 10 years industrial experience, Professional Engineering License preferred.

c) What are the program's diversity goals for both gender and race/ethnicity in the faculty? Describe and assess the efforts being made to attain goals in (c).

No faculty has been hired in four years, so no current goals are in place.

J. ORIENTATION. DESCRIBE AND ASSESS THE ORIENTATION PROCESS FOR NEW FACULTY**.**

The FCTL extended orientation has been attended by all new faculty hired since program started in 1999.

K. REWARD STRUCTURE: E.G., SALARY, PROFESSIONAL DEVELOPMENT FUNDS, TRAVEL FUNDS, UCEL AND FSUGR INCENTIVE MONEY

1) Describe the reward structure in the programs/college as it relates to program faculty. Indicate the type of reward and eligibility criteria.

The College of Engineering Technology encourages and supports faculty in development activities. Potential activities are selected by an individual faculty member; an application is completed by that faculty member, is supported by the Department Chair and is then submitted to the College of Engineering Technology Associate Dean. Upon receipt, the Associate Dean will evaluate the

application and provide written support of their activity. Approved professional development activities are supported financially for various aspects of the project including travel, lodging, conference fees, support materials, meals, etc. Upon completion of the event, the faculty member is required to submit a summary report detailing the experience and how this obtained knowledge will support classroom activities. They are also required to share their newly acquired knowledge with faculty peers. Upon review of this report by the Associate Dean, reimbursement funds are transferred to the program.

2) Does the existing salary structure have an impact on the programs' ability to recruit and retain quality faculty?

No

3) Is the reward structure currently in place adequate to support faculty productivity in teaching, research, and service? If not, what recommendations would you make to correct the situation.

None

4) Is enhancing diversity and inclusion a component of the reward structure? Please explain.

No

L. GRADUATE INSTRUCTION (IF APPLICABLE)

No graduate courses or programs are offered.

a) List all faculty teaching graduate courses. N.A.

b) What percentage of graduate courses is taught by non-tenure-track faculty?
Please comment. N.A.

c) What are the program's (or department's) criteria for graduate faculty? N.A.

d) Have all graduate faculty (including non-tenure-track faculty) met the criteria? Please comment. N.A.

M. NON-TENURE-TRACK AND ADJUNCT FACULTY.

1. Please provide a list for the last academic year of full-time non-tenure-track and adjunct faculty who taught courses in the program. For full-time non-tenure track faculty, indicate the length of their appointments and the number of years of service at the University. Comment on the program's ability to retain non-tenure-track faculty.

None

2. What percentage of program courses is taught by the faculty in (a)? - 0%

0%

3. Describe the required qualifications (academic and experiential) for faculty listed in (a). Indicate if all faculty have met the criteria, and if not, what is being done to resolve the situation?

N.A.

4. Does the program consider the current use of non-tenure-track faculty to be appropriate? Why or why not?

N.A.

5. If the program is accredited, what position if any does the accrediting body have regarding the use of non-tenured and adjunct faculty?

TAC/ABET accreditation does not address this in their criteria.

N. SERVICE TO NON-MAJORS.

1. Identify and describe the General Education service courses provided by the program faculty for other departments at FSU.

None

2. Identify and describe any non-General Education service courses or courses required for other programs. Comment on your interaction with the departments or programs for which the courses are provided.

ETEC 140 Engineering Graphics Comprehensive
MECH 250 Fluid Power with Controls
MECH 340 Statics and Strength of Materials

The above courses are offered on an as needed basis. This would include programs in Big Rapids and Grand Rapids. MECH 250, which was only taught spring term, is now offered both fall and spring due to requirements of the Welding program. ETEC 140 is required for several programs, but the section for MET students is taught by MET faculty. MECH 340 is used by several programs. The offerings are coordinated with various schools on an as needed basis and taught by MET faculty.

3. Discuss the impact of the provision of General Education and non-General Education courses has on the program.

Limits number of core courses in program.

4. ***Does the program plan to increase, decrease, or keep constant its level of service courses? Explain****.*

No changes are expected.

O. DEGREE PROGRAM COST AND PRODUCTIVITY DATA.

		Student Credit Hours				Full Time Equated Faculty				SCH/FTEF			
Prefix	Year	Summer	Fall	Spring	F+W (a)	Summer	Fall	Spring	Avg F+W (b)	Summer	Fall	Winter	F+W (a/b)
MECH	2004-05	44.00	745.00	865.00	1,610.00	0.19	3.49	3.24	3.36	231.58	213.73	267.07	478.84
MECH	2005-06	68.00	716.00	686.00	1,402.00	0.39	2.87	3.15	3.01	174.36	249.77	217.78	466.04
MECH	2006-07	80.00	747.00	657.00	1,404.00	0.67	3.52	3.52	3.52	119.40	212.39	186.83	399.22
MECH	2007-08	28.00	784.00	704.00	1,488.00	0.67	3.39	3.71	3.55	41.79	231.12	190.01	419.32
MECH	2008-09	68.00	769.00	0.00	769.00	0.67	3.31	0.00	1.66	101.49	232.02		464.04

From Institutional Research and Testing.

Only the Architectural – Facilities Management program has a higher SCH/FTEF than the MET program in the College of Engineering Technology. The average for the college was 349.39 during the same period. The programs numbers have been consistently higher for many years.

P. ASSESSMENT AND EVALUATION.

Describe and evaluate the program's assessment mechanisms.

1. ***List and describe what variables are tracked and why when assessing the effectiveness of the program (e.g. mastery of essentials of subject area, graduation rates, employment rates, pass rates on professional exams)***.

   The program uses TracDat (see Appendix D, for several TracDat reports) to maintain its assessment data. TracDat is a computer system accepted by the university to track course outcomes and assessments as required by the Higher Learning Commission (HLC). TracDat tracks data from courses, which then flows to the programs' assessments and outcomes. Additional data such as graduation rates, employment rates, etc., are not tracked on a consistent basis, but could be added to the TracDat system as an assessment tool.

   The programs also follow the requirements of TAC/ABET for Continuous Improvement Program (CIP) and assessment instruments in collecting and evaluating data.

2. Provide trend data for the variables listed in (1). Compare the data to accreditation benchmark standards if applicable, or provide some other type of assessment of the data.

The evaluation by TAC-ABET in fall 2009 found a concern with the programs Continuous Improvement Plan that faculty were not involved in it and putting their assessments in TracDat. At that time, the program was organizing its CIP program in TracDat, but no one other than the Program Coordinators and secretaries had access to TracDat. This has changed, so that all faculties have access.

3. Describe how the trend data in (2) is used to assess the rigor, breadth, and currency of the degree requirements and curriculum.

A meeting will be scheduled during orientation week 2010, for the faculty to review the CIP and discuss changes to the programs.

4. Describe how the trend data in (2) is used to assess the extent to which program goals are being met.

A meeting will be scheduled during orientation week for the faculty to review the CIP and discuss changes to the programs.

Q. ADMINISTRATION EFFECTIVENESS

1. ***Discuss the adequacy of administrative and clerical support for the program***.

The programs have one of the finest administrative support persons in the college.

2. Are the programs run in an efficient manner? Please explain.

Due to the reorganization of the college, many changes have occurred and operations are still changing. This has and will affect the faculty and operations for some time. The budget cuts required by programs have made changes in teaching loads and class sizes. A new School Director will start August 1, 2010, which will create changes in the operation of the program.

3. Are class and teaching schedules effectively and efficiently prepared? Please comment.

Yes

4. Are students able to take the courses they need in a timely manner? Please comment.

Block schedules are prepared and given to students each semester to assist them in their scheduling. Students are required to meet each semester with their faculty advisor to review classes and to help keep them on track. At that time, the advisor releases an advising hold and the student is allowed to register.

Section 4: Facilities and equipment

A. INSTRUCTIONAL ENVIRONMENT

1. Are current classrooms, labs, and technology (both on-campus and at off-site locations) adequate? Explain.

The MET program laboratories occupy two adjoining rooms on the third floor of the five-story Swan Technical Building. Additionally, a project room, Swan 219, has been reallocated to the MET programs. The computer lab assigned to the program is located on the first floor, SWAN 105A. It has 25 desktop computers available for instruction and student use. Classrooms for lectures are also located along a common hallway on the third floor of the SWAN Building. These rooms are shared with other programs in the College of Engineering Technology. Faculty offices are located nearby in Johnson Hall, a remodeled former dormitory.

In summer 2002, a major renovation took place in Swan 303 – known as the Fluid Power/Fluid Mechanics Lab. Saving one fume hood, all of the remnants were removed. These were replaced with hardwood work benches and two deep sinks making the space much more flexible and usable.

The laboratory facilities are used primarily for courses offered by the MET programs. Occasional use of these rooms includes enrichment programs and students taking Product Design courses.

Since the inception of the MET programs, there were no changes in available lab space until the summer of 2007. At that time, Swan 219 (described below) was reallocated to the MET programs for project space. Power and hand tools, materials, benches, and cabinets were moved into the room from third floor MET labs. Faculty obtained additional furnishings that had been declared surplus by other campus departments. Plans for removal of printing equipment and remodeling the space have been made; however, funding was reduced to only provide the installation of double doors.

The Mechanical Engineering Technology (MET) Laboratory Areas and the Courses They Support

MECHANICAL MEASUREMENTS LABORATORY - Room 302 Swan Building
24.6 ft x 30 ft = 738 sq ft
Capacity = 12 students

MECH 221 Mechanical Measurements with Computer Applications
3 hours lecture, 3 hour lab, 4 credits
Offered each Spring Semester, primarily for MET students
Usually, 1 lecture section and 2 lab sections

MECH 341 Lab for Statics and Strengths of Materials
0 hours lecture, 2 hour lab, 1 credit
Offered in the fall for MET majors.

MECH 421 MET Senior Lab
3 hours lecture, 3 hour lab, 4 credits
Uses this space in fall as well as Swan 303.
MECH 499 MET Senior Project.
2 hours lecture, 3 hour lab, 3 credits.
Spring semester. Swan 302, along with rooms 303 and 219, are used
by many MET seniors for planning and testing senior projects.

FLUID MECHANICS AND FLUID POWER LABORATORY - Room 303 Swan Building

42.5 ft x 30 ft = 1275 sq ft
Capacity = 12/16 students

MECH 211 Fluid Mechanics (12 student limit due to equipment)
3 hours lecture, 3 hour lab, 4 credits
Offered each Fall Semester, primarily for MET students
Usually, 1 lecture section and 2 lab sections
MECH 250 Fluid Power with Controls (16 student's maximum)
1 hour lecture, 2 hour lab, 2 credits
Offered each Spring Semester, primarily for Plastics Technology students.
Usually, 2 lecture sections and 4-5 lab sections
MECH 421 MET Senior Lab (12 students max.)
3 hours lecture, 3 hour lab, 4 credits.
Offered in the fall for MET seniors.
MECH 499 MET Senior Project.
2 hours lecture, 3 hour lab, 3 credits.
Spring semester. Swan 302, along with rooms 303 and 219, are used
by many MET seniors for planning and testing senior projects.

MULTI-DISCIPLINARY PROJECT ROOM - Room 219 Swan Building
50 ft x 31.5 ft = 1575 sq ft
Capacity = 15-20 students

The room is partitioned into three areas. Benches, power tools, hand tools, hardware, electric and pneumatic controls, and other materials are available. Extracurricular multidisciplinary student projects use this space for planning and construction. These projects HAVE included:
Ferris State Rube Goldberg Team
Ferris State Human-Powered Vehicle Team
Ferris State Formula SAE team (v. limited use)
MET homecoming float
MECH 211 Fluid Mechanics, MECH 221 Mechanical Measurements,
and MECH 421 MET Senior Lab students use the space for prototype
construction for single projects.
MECH 499 MET Senior Project
2 hours lecture, 3 hour lab, 3 credits.
Spring semester. Swan 302, along with rooms 303 and 219, are used
by many MET seniors for construction of senior projects.
Seniors in Product Design and in Electrical/Electronics Engineering Technology also use the space for project construction.

2. Changes since last APR

Since the last APR in 2004, Swan 219, Multi-disciplinary Project Room has become available to the MET programs. This space is open to all students in the college.

Recent Major Equipment Additions for the MET Laboratories

Year	Item	Total
2007	NI compact RIO Portable Data Acquisition System with signal condition (Ferris Foundation grant and National Instruments grant)	$9,300
2008	NI USB A-D converters and additional PCI card (equipment funds)	$4,800
2009	DATAQ GL900 multichannel data logger (Ferris Foundation grant)	$3,995

3. How do the condition of current facilities impact program delivery? Explain.

a) Adequacy of Facilities

Lecture rooms provide ample space. Swan 304 was remodeled in 2008 to provide better orientation. A modern instructor station with computer, projector, document camera, and multimedia capabilities was installed. The layout has presented visibility issues for students. This is the first and only instructor station equipped room readily available to MET faculty. More are needed.

MET Program Concern 2 from the 2003 TAC-ABET visit noted the limited lab space for the MET programs and the resulting limit on lab equipment. The concern also noted the spacious labs as provided by nearby programs. The TAC-ABET visitor did not see all CET facilities but would have seen more of the same. Large sums of money have been spent to expand and upgrade labs for other programs. Additionally, a major MET initiated multi-disciplinary project, the Formula SAE car, should be housed in the Swan complex where it is close to the MET labs and equipment, the manufacturing lab, and to MET and manufacturing students and faculty that support the project. Swan 303 becomes cramped for space for senior projects and labs each spring.

A Fanuc industrial robot was donated to the MET programs this past year with the help of a freshman student; however, there is no space large enough to accommodate the unit. Space in other departments has been sought. Current options include exchanging the unit for a smaller one still to be housed in a different location.

b) Comparison of Laboratory Equipment, Computing Equipment, and Software to that Used in Industry

Lab equipment is sometimes dated and small, but is generally not atypical of that found in industries. The computers in the measurement lab are very dated and slow, but do perform the same tasks as those used in industry. Software selection is based on what is found in industry: AutoCAD, PRO-E/Mechanical, LabVIEW, and Office are examples. Students used their own laptops this spring for a programming class. They used the open source Octave (free MATLAB clone) and a student version of MathCAD as these programs were not otherwise available to them.

c) Describe the program's projected needs with respect to instructional facilities.

One or more, large laboratories

d) Describe current plans for facilities improvements and indicate their status.

None

e) Describe how proposed changes or improvements to facilities would enhance program delivery.

Additional laboratory sections could be taught. Rooms would not be as crowed with equipment and projects. Programs have very limited storage areas.

B. COMPUTER ACCESS AND AVAILABILITY

1. Outside of computers in faculty and staff offices, identify the computing resources (hardware and software) that are allocated to the program.

SWAN 219 has 24 computers. The room is used by several MET courses and by other programs. The program also has six computers in SWAN 301. These computers are quite old and need replacing. Software used by the program runs very slow on these. Replacement of some faculty computers is scheduled for July of this year, but not laboratory computers.

2. Discuss how these resources are used.

Computers are used in most courses by students for class projects, learning new software and analysis for project designs.

3. Discuss the adequacy of these resources and identify needed additional resources.

The computers are old and are inadequate for current software. Processing with FEA takes considerable time.

4. Does an acquisition plan to address these needs currently exist? Describe the plan. Has it been included in the department or college's planning documents?

No. Replacement of the computers under the programs purview would costs approximately $45,000, which is not available under current budget constraints.

5. Discuss the efficacy of online services (including Web `CT) available to the program.

The use of on-line services is limited. Experience by some faculty have had mixed reactions from the students. As the nature of the programs is "hands-on," on-line instruction does not adapt well to many of the courses.

6. Discuss the adequacy of computer support, including the support for on-line instruction if applicable.

See 5) above

C. OTHER INSTRUCTIONAL TECHNOLOGY

1. *Identify other types of instructional technology resources that are allocated or available to the programs.*

Teaching stations with ceiling mounted projectors are installed in SWAN 105A and SWAN 304.

2. Discuss how these resources are used.

The stations are used in various classes

3. Discuss the adequacy of these resources and identify needed additional resources.

Poor planning was used in the remodeling of SWAN 105A and SWAN 304. In 105A, the desks are too close together, making it difficult for an instructor to go behind a student to provide assistance. In SWN 304, the room is spread so wide, that when it is full of students, the screens and white boards cannot be seen.

4. ***Does an acquisition plan to address these needs currently exist? Describe the plan. Has it been included in the department or college's planning documents****?*

No.

5. Discuss the impact of adequacy of other types of instructional technology resources and support of these resources on the pro*gram.*

Interferes with teaching process; restricts the number of students in SWN 304.

D. LIBRARY RESOURCES

1) Discuss the adequacy of the print and electronic and other resources available through FLITE for the programs.

FLITE provides adequate access to books or more importantly databases the students require. Majority of learning comes from course textbooks and the internet.

2) Discuss the service and instruction availability provided by the Library faculty and staff with respect to the needs of the programs.

The staff keeps the faculty informed on books that are available and provides opportunities for the staff to request particular books.

3) Discuss the impact of the budget allocation provided by FLITE to your program. Is the budget allocation adequate? Explain.

There has been no effect. The students do not use the library very often.

Section 5: Conclusions

Conclusions based on data analysis derived from Sections 2-4 and on the collective wisdom and judgment of the PRP. In arriving at these conclusions, the PRP should summarize the relationship of the program to each of following specific categories and any other categories it deems appropriate:

A. RELATIONSHIP TO FSU MISSION

University's Mission:

> Ferris State University prepares students for successful careers, responsible citizenship, and lifelong learning. Through its many partnerships and its career-oriented, broad-based education, Ferris serves our rapidly changing global economy and society.

Program's Mission:

> The Mechanical Engineering Technology (MET) programs seek to provide a stimulating learning environment to prepare students for the broad array of technical careers associated with the discipline.

The program's mission follows the university's mission by preparing students to be successful in their careers and develop an environment which encourages the students to continue their learning after completing their degree. Learning does not stop when one leaves the university, but continues with job growth and position. Our students are encourage to take whatever steps are need to continue in their careers

B. PROGRAM VISIBILITY AND DISTINCTIVENESS

As the BS degree is relatively new (10 years), the interest by industry and businesses has just begun to take off. Major companies (Fortune 500) have visited or contacted the program in regards to students for internships and full-time employment. It is becoming one of the best known Mechanical Engineering Technology programs in the U.S. Due to the location and size of Ferris, this process has taken some time. As an example, last summer the program was contacted by Schlumberger, a $28 billion company. They had researched programs around the country and settled on six universities they wanted to recruit from. Ferris was one of them.

Recently a father and son visited Ferris from Batavia, Illinois. The company the father works for has a program graduate. The father was impressed enough to bring his son over here to see the campus and discuss the program. Our graduates are our best marketing tool.

We have been informed that the program tends to get 30,000 hits a month on its web site.

C. PROGRAM VALUE

The program is providing our students with a value for their dollar. Employment rates are high, considering the market. We receive many inquiries for our students which are of value to them. We also have the opportunity for value added, by having several extracurricular activities that the students can get involved in. This is becoming important to employers who receive numerous applications and must make a decision. They have told they are looking for activities that the students become involved in, outside the classroom. Our Formula Car, Baja, HPV, and Rube Goldberg Competition offer the student a chance to go one up on other graduates.

D. ENROLLMENT

Enrollment currently is down 4.3%, which is better than the college as a whole. It has been increasing each year since 2006. We expect that by 4th day count, the enrollment will be higher. We are receiving more transfer students, both internally and from other universities and community colleges. This is expected to grow as more students attend community colleges to reduce their educational costs.

E. CHARACTERISTICS, QUALITY AND EMPLOYABILITY OF STUDENTS

Data presented above shows that graduates of the program are obtaining jobs, even the tough job market which the country is in. We expect that this will get better as the economy recovers and more jobs are created in the markets where our graduates go.

F. QUALITY OF CURRICULUM AND INSTRUCTION

The curriculum and instruction of the program is very good. There are opportunities for improvements and the faculty will be studying these in the coming months.

G. COMPOSITION AND QUALITY OF THE FACULTY

Generally the faculty is well qualified to teach the curriculum and students have given the faculty good grades. But as stated above, there is always room for improvement. We believe the interest by various industries and companies in the programs' graduates is a testament to the quality of curriculum, instruction and faculty. Additional facilities and equipment would assist the faculty in improving instruction. This has been brought up in previous APR's and by TAC/ABET in its previous and current report.

APPENDIX A. Industrial Board Survey

Survey of Industrial Advisory Board meeting on April 23, 2010

QUESTIONS	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Average
1. The MET Program provides education and training essential to many industries, both in and out of the State of Michigan.	5	1	0	0	0	4.83
2. The Program provides graduates with skills useful to your company.	5	1	0	0	0	4.83
3. The Program curriculum is appropriate for current industry needs.	3	3	0	0	0	4.50
4. The Program curriculum provides an adequate mix of classroom and laboratory-based learning.	2	3	1	0	0	4.17
5. Student projects are appropriate as a capstone for a BS in MET and demonstrate sufficient mastery of the curriculum.	2	0	4	0	0	3.67
6. Your company would hire a MET program graduate.	4	2	0	0	0	4.67
7. Program faculty have sufficient academic credentials.	5	1	0	0	0	4.83
8. Program faculty have adequate industrial experience.	4	1	1	0	0	4.50
9. Program faculty have adequate extra-curricular involvement with students.	5	1	0	0	0	4.83
10. The Program has adequate leadership.	5	1	0	0	0	4.83
11. The Program has adequate dedicated laboratory space.	0	0	2	2	2	2.00
12. Classrooms used by the Program have adequate instructional technology.	0	3	1	2	0	3.17
13. Labs have adequate tools and materials to provide students with a sufficient hands-on learning experience.	0	2	1	2	1	2.67
14. The Program has adequate student workspace available for both curricular and extra-curricular student projects.	0	1	2	1	2	2.33

Labor Market Analysis for Academic Program Review
Ferris State University Mechanical Engineering Technology

The United States Department of Labor's Bureau of Labor Statistics has updated the Occupational Outlook Handbook for 2010-11 for Mechanical Engineering Technicians and Mechanical Engineers. Technicians are generally classified as having an AAS degree in engineering technology. The BLS classifies engineers as having graduated with a BS or higher in engineering. Graduates from BSM ET programs fall between these two and are able to accept positions in either category. Ferris' Mechanical Engineering Technology Programs' students accept jobs upon graduation as engineers, technologists, and technicians.

Employment Outlook

Nationally the outlook for mechanical engineering technicians is relatively flat. The BLS expects there to be approximately a 1% decline in these positions between 2008 and 2018. The number of mechanical engineering technicians employed in the U.S. in 2008 was 46,100 and is projected to be 45,500 in 2018. The need for new technicians is expected to be 12,000 during this timeframe. There were approximately 82,000 mechanical engineering technologists in 2006 and the number is expected to remain the same through 2016. However, the need for new engineering technologists during this time is expected to be about 18,000. In 2008, there were 238,700 mechanical engineers employed in the United States. The number of mechanical engineering jobs is expected to grow by 6% between 2008 and 2018 to a total of 253,100. The number of new positions during this time is expected to be approximately 58,000. In total, the number of new positions between 2008 and 2018 is expected to be 88,000 nationwide.

In recent history, the State of Michigan has held the number one position for the highest concentration of mechanical engineering technicians and mechanical engineers in the country. Two of the top five metro areas in the country in terms of the highest concentration of mechanical engineering technicians relative to all other occupations have been in Michigan; the Niles-Benton Harbor area at number one and the Warren-Troy-Farmington Hills area at number five. The same two metro areas rank in the top five for concentration of mechanical engineers as well.

Salaries

Engineers have among the highest median starting salaries when compared to all college graduates with bachelor's degrees. Of 13 different engineering programs, mechanical engineers with bachelor's degrees were right in the center with an average starting salary offers of $58,766 in July 2009. The mean salary for all mechanical engineers was $78,200 in May 2008, but this number includes engineers with bachelor' degrees as well as graduate degrees. As of May 2008, the mean salary for mechanical engineering technicians (not just recent graduates) was little more than $50,000, while the average for mechanical engineering technologists was $56,850. Graduates with a BS MET should expect an average starting salary of something less than that of engineering graduates since the average of all mechanical engineering technologists is nearly the same as the average for starting mechanical engineers.

APPENDIX C. - Checksheet
MET AAS, BS Program Requirements, Course sequence

FERRIS STATE UNIVERSITY
Imagine More

Associate in Applied Science
Mechanical Engineering Technology
Bachelor of Science
Mechanical Engineering Technology
Program Academic Requirements

Student:				Transfer Credits:	
Email:		ID		GPA Major:	
Advisor:		Ph		GPA Degree:	

ENTRY CRITERIA FOR ASSOCIATE in APPLIED SCIENCE :
1. 2.0 GPA High School or College Transfer
2. H.S. Algebra (or MATH 110 or equiv.) and 19 MATH ACT - MATH 116 Placement

ASSOCIATE DEGREE REQUIREMENTS

MAJOR			Cr	Gr	T
MECH	111	MET Seminar (Admit to MECH)	1		
MECH	122	Computer Applications (MATH 116)	2		
MECH	211	Fluid Mechanics (MATH 126, PHYS 211)	4		
MECH	212	Kinematics of Mechanisms (MATH 216, PHYS 211)	2		
MECH	222	Machine Design (MECH 340)	4		
MECH	223	Thermodynamics (MATH 216 or 220, PHYS 211)	3		
MECH	340	Statics & Strengths of Mat'ls (MATH 126, PHYS 211)	4		
MECH	341	Statics & Strengths of Mat'ls Lab (MECH 340 co-req)	1		
TECHNICAL RELATED COURSES					
EEET	201	Electrical Fundamentals (MATH 116)	3		
ETEC	140	Engineering Graphics	3		
MFGT	150	Manufacturing Processes	2		
COMMUNICATIONS COMPETENCE					
COM	121	Fundamentals of Public Speaking	3		
ENGL	150	English 1	3		
ENGL	250	English 2 (ENGL 150)	3		
SCIENTIFIC UNDERSTANDING					
CHEM	114	Intro to General Chemistry*	4		
PHYS	211	Introductory Physics 1 (MATH 116 or MATH 120 or 26 ACT)	4		
QUANTITATIVE SKILLS					
MATH	116	Intermediate Algebra (19 ACT or C- in MATH 110)	4		
MATH	126	Algebra & Analytical Trig. (24 ACT or C- in MATH 116)	4		
MATH	216	Applied Calculus (MATH 126)	4		
CULTURAL ENRICHMENT					
		Cultural Enrichment Elective	3		
SOCIAL AWARENESS					
		Social Awareness Elective	3		
FRESHMAN SEMINAR					
FSUS	100	FSU Seminar	1		

ENTRY CRITERIA FOR BACHELOR of SCIENCE:
1. AAS in Mechanical Engineering Technology
2. 2.7 GPA in MET Major; 2.5 GPA in AAS MATH; Math 216 or 220 comp.
3. 2.5 GPA in AAS MATH; Math 216 or 220 competency

BACHELOR DEGREE REQUIREMENTS

MAJOR			Cr	Gr	TR
MECH	311	Finite Elem Analysis/Modeling (ETEC 140, MECH 340)	2		
MEC	330	Heat Transfer (MATH 216, MECH 223)	3		
MEC	332	Mechanical Measurements/Mechatronic	3		
MEC	360	Dynamics (MATH 216, Jr. Status)	3		
MEC	393	Industrial Internship	4		
MEC	421	MET Senior Lab (MECH 330, EEET 201)	4		
MECH	440	Noise & Vibration (MATH 216 or 220, MECH 360)	3		
MECH	499	MET Senior Project (Senior Status, MECH 421, ENGL 300 co-req)	3		
TECHNICAL RELATED COURSES					
MATL	240	Intro to Material Science	4		
MATL	341	Material Selection - Metals (MATL 240)	3		
MFG	341	Quality Science Statistics (MATH 116)	3		
MFG	423	Engineering Economics (MATH 126)	2		
		Computer Programming Elective	2		
		Approved Technical Elective **	3		
	---	Approved Technical Elective **	3		
COMMUNICATIONS COMPETENCE					
ENGL	311	Advanced Technical Writing *** (ENGL 250)	3		
QUANTITATIVE SKILLS					
MAT	226	Fourier Series & Appl. Diff. Equ. (MATH 216)	4		
SCIENTIFIC UNDERSTANDING					
PHYS	212	Introductory Physics 2 (PHYS 211, *)	4		
CULTURAL ENRICHMENT					
		Cultural Enrichment Elective	3		
		Cultural Enrichment Elective (200 level or above)	3		
SOCIAL AWARENESS					
		Social Awareness Elective	3		
		Social Awareness Elective (200 level or above)	3		

General Education Requirements: One course (3cr): Global Consciousness, One Course (3cr): Race - Ethnicity - Gender(REG), One Course(3cr): Foundation – Multiple Requirements may be satisfied by a single course.
Cultural Enrichment – 9 credits (3 credits in course > 200 level);
Social Awareness - 9 credits (3 credits in course > 200 level)
Reference: http://www.ferris.edu/htmls/academics/gened/gen_edspecific.html

Contact the Mechanical Design Department for more information.
Phone: 231-591-2755 Email: mdm@ferris.edu
www.ferris.edu/technology

FERRIS STATE UNIVERSITY
Imagine More

Associate in Applied Science
Mechanical Engineering Technology
Bachelor of Science
Mechanical Engineering Technology
Course Sequence Guide

Student:			
Email:		ID:	
Advisor:		Ph:	

YEAR 1 - FALL SEMESTER			Crs	Gr
MECH	111	MET Seminar (Admit to MECH)	1	
ETEC	140	Engineering Graphics	3	
MFGT	150	Manufacturing Processes	2	
ENGL	150	English 1	3	
MATH	116	Intermediate Algebra (19 ACT or C- in MATH 110)	4	
		Cultural Enrichment Elective	3	
FSUS	100	FSU Seminar	1	
		Total	**17**	

YEAR 1 - SPRING SEMESTER			Crs	Gr
MECH	122	Computer Applications (MATH 116)	2	
ENGL	250	English 2 (ENGL 150)	3	
PHYS	211	Introductory Physics 1 (MATH 116 or 120 or 26 ACT)	4	
MATH	126	Algebra & Analytical Trig. (24 ACT or C- in MATH 116)	4	
		Social Awareness Elective	3	
		Total	**16**	

YEAR 2 - FALL SEMESTER			Crs	Gr
MECH	211	Fluid Mechanics (MATH 126, PHYS 211)	4	
MECH	340	Statics & Strengths of Mat'ls (MATH 126, PHYS 211)	4	
MECH	341	Statics & Strengths of Mat'ls Lab (MECH 340 co-req)	1	
CHEM	114	Intro to General Chemistry*	4	
MATH	216	Applied Calculus (MATH 126)	4	
		Total	**17**	

YEAR 2 - SPRING SEMESTER			Crs	Gr
MECH	212	Kinematics of Mechanisms (MATH 216, PHYS 211)	2	
MECH	222	Machine Design (MECH 340)	4	
MECH	223	Thermodynamics (MATH 216 or 220, PHYS 211)	3	
EEET	201	Electrical Fundamentals (MATH 116)	3	
COMM	121	Fundamentals of Public Speaking	3	
		Total	**15**	

Prerequisite for third and fourth year courses is admittance into BS MET Program

YEAR 3 - FALL SEMESTER			Crs	Gr
MECH	311	Finite Elem Analysis/Modeling (ETEC 140, MECH 340)	2	
MECH	330	Heat Transfer (MATH 216,MECH 223)	3	
MATL	240	Intro to Material Science	4	
MFGE	341	Quality Science Statistics (MATH 116)	3	
PHYS	212	Introductory Physics 2 (PHYS 211, *)	4	
		Total	**16**	

YEAR 3 - SPRING SEMESTER			Crs	Gr
MECH	332	Mechanical Measurements/Mechatronic	3	
MECH	360	Dynamics (MATH 216, Jr. Status)	3	
MFGE	423	Engineering Economics (MATH 126)	2	
		Computer Programming Elective	2	
MATH	226	Fourier Series & Appl. Diff. Equ. (MATH 216)	4	
		Cultural Enrichment Elective	3	
		Total	**17**	

YEAR 3 - SUMMER SEMESTER			Crs	Gr
MECH	393	Industrial Internship	4	
		Total	**4**	

Submit Application for Graduation.

YEAR 4 - FALL SEMESTER			Crs	Gr
MECH	421	MET Senior Lab (MECH 330, EEET 201)	4	
MECH	440	Noise & Vibration (MATH 216 or 220, MECH 360)	3	
MATL	341	Material Selection - Metals (MATL 240)	3	
		Approved Technical Elective **	3	
		Social Awareness Elective (200 level or above)	3	
		Total	**16**	

YEAR 4 - SPRING SEMESTER			Crs	Gr
MECH	499	MET Senior Project (Senior Status, MECH 421, ENGL 300	3	
	---	Approved Technical Elective **	3	
ENGL	311	Advanced Technical Writing *** (ENGL 250)	3	
		Cultural Enrichment Elective (200 level or above)	3	
		Social Awareness Elective	3	
		Total	**15**	

* Either PHYS 212 or CHEM 114 may be taken in AAS Degree; Both are req'd for BS Degree

** 40 Credits of 300 Level Coursework or above are required for graduation.

Transfer students should contact an MET faculty to discuss options when starting program.

** Any combination of six or more credits of advisor approved technical electives may be applied to the degree.

*** ENGL 311 should be taken simultaneously with MECH 499.

APPENDIX D. Examples of Syllabi

Ferris State University
College of Engineering Technology / Mechanical Engineering Technology
COURSE TITLE: MECH 111-001 MET Seminar

COURSE DESCRIPTION: An introduction to the Mechanical Engineering Technology program. The student is introduced to the MET faculty, to the procedures for scheduling, and to the program requirements. Careers in engineering and technology are reviewed and the excitement and challenge of engineering design and experimental testing are explored**.**

CREDIT HOURS: One Semester Hour

CONTACT HOURS: Lecture - 0 Hour/Week
Lab - 2 Hour/Week

PREREQUISITE: MET Technical Standing

TEXTBOOK REQUIRED: Introduction to Engineers Technology, Pond

UNITS OF INSTRUCTION AND STUDENT LEARNING GOALS FOR EACH UNIT:

The student will--

I. Introduction

A. Know the course goals, the attendance policy and grading policy

B. Be familiar with the MET program, meet the faculty and learn the office locations

C. Understand what an engineering technologist is

II. Engineering and Technology

A. Understand the makeup of the technological team

B. Be familiar with the areas covered by the career fields in engineering and technology

C. Comprehend the professional responsibilities of engineers and technicians

D. Understand the role of women in engineering and technology

III. Developing Study Habits

A. See the need for good study habits

B. Understand what good study habits are and how to prepare for exams

IV. Spoken and Written Communication

A. Understand the elements of spoken and written communication

B. Comprehend the importance of communication skills for the engineering technologist

V. Engineering Design

A. Understand the role of modeling in engineering designs

B. Understand some of nature's designs that are of interest in engineering

C. Understand the design process and the phases of design

D. Mini Project

VI. Introduction to Engineering Analyses

A. Be familiar with the use of statistics in engineering

B. Be able to compute arithmetic mean, median, and mode

C. Be familiar with interest calculations in engineering economy

VII. Evaluation

A. Demonstrate an understanding of course objectives

Ferris State University
College of Engineering Technology
Mechanical Design Department
Spring 09

Syllabus

COURSE TITLE: MECH 122 - COMPUTER APPLICATIONS IN TECHNOLOGY

TEXT AND SUPPORTING MATERIALS:

Three-ring binder for Portfolio (see next page for details)

Storage device –stick, etc.

PRE-REQUISITES: MATH 116

INSTRUCTOR:

Office:
Mail Box:
E-mail:

Home phone:

OFFICE HOURS:

BASIS OF GRADE:

Homework	**60%**
Portfolio	**5%**
Tests/Quizzes	**5%**
Attendance	**5%**
Final	**25%**
	100%

GRADE SYSTEM: point scale used to grade all work. Letter grade based on breakdown as shown below

93-100%	**A**	**83-86**	**B**	**73-76**	**C**	**63-66**	**D**
90-92	**A-**	**80-82**	**B-**	**70-72**	**C-**	**60-62**	**D-**
87-89	**B+**	**77-79**	**C+**	**67-69**	**D+**	**<60**	**F**

ATTENDANCE: Regular attendance and participation are part of the learning process and are expected. Work missed due to a valid excused absence (with advance notice or notice in writing) will be due the next class period. Three absences are allowed. After the fourth absence, the student will be required to withdraw if the absence occurs during withdrawal period, if after the withdrawal period, the student will receive a failing (F) grade.

Exceptions to the Attendance Policy - Absences for the following reasons will be viewed as beyond the control of the individual and will not cause a person's grade to be lowered or cause them to withdraw from or fail the class, (unless the absences become so numerous as to make meeting the objectives of the course becomes impossible)

a. Death of a family member/or other significant person
b. Extended hospitalization
c. University sponsored events (permission from the Academic Vice President's Office is required).

d. Jury duty/or being subpoenaed for court testimony
e. Dangerous weather conditions in which driving is considered by local authorities to be unsafe.

Exceptions must be discussed with the instructor at the time they occur to be considered an excused absence.

LATE ASSIGNMENTS: 10% of the assignment value deducted from the points awarded for each day the assignment is late.
PORTFOLIO: The intent of the portfolio is to help students to organize and summarize the efforts over the semester. It will be turned in for review at the middle and the end of the term. A three ring binder is to be used and should include the following, labeled, sections:

- TITLE PAGE, class number and title, semester, name.
- COURSE SYLLABI
- CLASS NOTES
- HANDOUTS
- ASSIGNMENTS
- TESTS and QUIZZES

MECH 122

Tentative Schedule –Winter 2007

Session	Introduction to Computers	**Pages**	**Assignment**
1	What is a Computer?		
2	Internet – Searching the Web		
3	Internet - The Web (Invisible Web)		
4	Operating Systems - Vista		
5	Vista		
6	Software		
7	Word 2007		
8	Word 2007		
9	Word 2007		
10	Word 2007		
11	Word 2007		
12	Excel 2007		
13	Excel 2007		
14	Excel 2007		**Sine Curve**
15	Excel 2007		**Otto Cycle Model**
16	Excel 2007		
17	Excel 2007		**Rankin**

18	Excel 2007		
19	Excel 2007		
20	Access 2007 – Tables, Forms, views & Wizards		
21	Access 2007 – Reports and Queries		
22	Access 2007 – Relation Database		
23	PowerPoint 2007		
24	PowerPoint 2007 – Enhancing		
25	PowerPoint 2007 - Presentation		
26	Power behind Office – Visual Basic		
27	Graphics		
28	Graphics		
29	Graphics		

Ferris State University
College of Engineering Technology
Mechanical Design Department

Revised: C. Drake
Date: 6-20-03

COURSE SYLLABUS

COURSE TITLE: MECH 211 Fluid Mechanics

COURSE DESCRIPTION: This course presents the principles of fluid flow measurement, low speed aerodynamics, and gas flow systems. The laboratory activity covers experimental confirmation of the theory as well as demonstration of the operation of pneumatic and hydraulic fluid power components, circuits and control systems. An introduction to computational fluid mechanics (CFM) using finite element methods also is presented.

CREDIT HOURS: Four Semester Hours
CONTACT HOURS: Lecture - 3 Hours/Week
Lab - 3 Hours/Week
PREREQUISITES: MATH 126, MECH 340 (Co requisite)
TEXTBOOK REQUIRED: Applied Fluid Mechanics; 5th Edition; Mott; Merrill; 2000

OTHER MATERIALS: Texas Instrument TI-85 Calculator or equivalent; Computer Memory Disks (2); Science Laboratory Notebook; Fluid Power Template; Engineering Paper

UNITS OF INSTRUCTION AND STUDENT LEARNING GOALS FOR EACH UNIT:
The student will--

I. Introduction
   A. Course goals
   B. Grading and attendance policy
   C. Review units of measure (SI, cgs and US customary systems
II. Basic Fluid Properties
   A. Newtonian and Non-Newtonian
   B. Measure specific gravity
   C. Measure viscosity with a capillary tube viscometer and a Say bolt viscometer
III. Fluid Pressure and its Measurement
   A. Calibrate a pressure gauge with a dead-weight pressure tester
   B. Measure atmospheric pressure with a barometer
IV. Forces and Moments on Submerged Surfaces
   A. Calibrate forces and moments on submerged plane areas
   B. Calibrate forces and moments on submerged curved surfaces
   C. Prepare a fluid power schematic of an air compressor system
V. Pneumatic Fluid Power
   A. Calculate and test the buoyancy and stability of floating and submerged bodies
   B. Assemble, operate, and prepare fluid power schematics for a pneumatic workstation and a hydraulic bench
VI. Buoyancy and Stability
   A. Calculate fluid flow in pipes with the Bernoulli equation
   B. Assemble, operate and prepare fluid power schematics for pneumatic and hydraulic valve, cylinder and motor circuits
VII. Hydraulic Fluid Power
   A. Calculate fluid flow in pipes with the general energy equation

B. Measure the pressure distribution through a venturi flow meter
C. Assemble, operate and prepare fluid power hydraulic cylinder sequence valve circuit

VIII. Bernoulli Equation
A. Investigate laminar and turbulent flows and the velocity profile for laminar flow
B. Consider circular and non-circular cross-sections
C. Assemble, operate and prepare fluid power schematics for a pneumatic cylinder circuit with automatic reciprocation and a hydraulic cylinder circuit with an accumulator

IX. General Energy Equation
A. Introduce Moody's diagram for friction factor and calculate and measure energy losses due to fluid friction for laminar and turbulent flows
B. Assemble, operate and prepare fluid power and electric schematics for a hydraulic cylinder circuit with control relays

X. Laminar and Turbulent Flows
A. Calculate energy losses in flow system components
B. Measure the loss coefficients for a variety of flow meter orifices
C. Assemble, operate and prepare fluid power and electric schematics for a hydraulic cylinder circuit with limit switches

XI. Energy Losses Due to Friction
A. Analyze series pipe systems
B. Assemble, operate and prepare fluid power and electric schematics for a hydraulic cylinder circuit with pressure switches

XII. Electro Hydraulics
A. Analyze parallel pipe systems
B. Apply the Hardy-Cross method for solving pipe systems with three or more branches
C. Assemble, operate and prepare schematics for OR/NOR, AND/NAND and FLIP-FLOP fluidic logic gates

XIII. Minor Losses
A. Calculate flows in open channels
B. Analyze tranquil and rapid flows and hydraulic jumps
C. Assemble, operate and prepare schematics for control of an air cylinder with fluidic logic gates

XIV. Series Pipe Systems
A. Study flow measurement, including variable head meters, variable area meters, turbine flow meters, vortex flow meters, and magnetic flow meters
B. Measure orifice coefficients
C. Introduction to computer based data acquisition and processing

XV. Parallel Pipe Systems
A. Examine pump performance and selection in fluid transport applications
B. Assemble, operate and prepare schematics for control of an air cylinder with fluidic logic gates

XVI. Fluidic Logic
A. Analyze forces due to fluid motion
B. Measure the force of jet impact on flat and curved surfaces
C. Assemble, operate and prepare schematics for a fluidic multi-vibrator circuit and for a logic identity that replaces an AND gate by three NOR gates

XVII. Open Channel Flow
A. Study lift and drag forces on aerodynamic shapes

XVIII. Flow Measurement
A. Examine the flow of air and other gases through fans, blowers and compressors
B. Design ductwork to carry air at low pressure in ventilation, heating and air conditioning systems

C. Assemble, operate and prepare schematics for a fluid level sensor using a Schmitt trigger

XIX. Pump Performance

A. Introduce computational fluid mechanics (CFM) using finite element methods

B. Examine details of flow fields generated in laboratory experiments

XX. Testing and Evaluation

Ferris State University
College of Engineering Technology
Mechanical Design Department

Revised: C. Drake
Date: 3/5/01

COURSE SYLLABUS

COURSE TITLE: MECH 330 Heat Transfer

COURSE DESCRIPTION: This course introduces the student to the fundamentals of heat transfer that are commonly found in many processes and products. The physical concepts of conduction, convection, and radiation heat transfer are covered with emphasis on problem solving and practical application. Computer solutions are included.

CREDIT HOURS: Three Semester Hours

CONTACT HOURS: Lecture - 3 Hour/Week
Lab - 0 Hour/Week

PREREQUISITES: MATH 216, MECH 223

TEXTBOOK REQUIRED: Heat Transfer with Applications, Kirk D. Hagen, 1999**.**

UNITS OF INSTRUCTION:

STUDENT LEARNING GOALS FOR EACH UNIT:

The student will –

Introduction
- Become familiar with course goals, attendance and grading policy, and how to reach instructor.
- Become familiar with the science of heat transfer including many examples and applications.
- Review systems of units.

Fundamental Concepts
- Become familiar with the "Zeroeth Law of Thermodynamic."
- Review engineering units.
- Examine concept of conduction.
- Examine concept of convection.
- Examine concept of thermal radiation
- Solve combination heat transfer problems.

One-Dimensional Steady Conduction
- Understand the analogy between thermal resistance and electrical resistance.
- Determine overall heat transfer coefficient
- Determine R-value and its application to insulation.
- Determine critical insulation radius.
- Solve problems involving internal heat generation.
- Determine thermal contact resistance.

Apply concepts of chapter to design applications.

- Extended Surfaces
- Describe fin classification and analysis assumptions
- Evaluate longitudinal fins
- Evaluate pin fins.
- Evaluate radial fins.
- Determine when fins should be used.
- Optimise fin design.
- Apply concepts of chapter to design applications.

Two-Dimensional Steady Conduction

- Determine conduction shape factor.
- Solve two-dimensional conduction problems with analytical methods.
- Solve two-dimensional conduction problems with numerical methods.
- Apply computer spreadsheets and/or math solvers to 2-D conduction problems.
- Apply concepts of chapter to design applications

Unsteady Conduction

- Examine lumped heat-capacity systems
- Examine semi-infinité régions.
- Determine temperature decay for symmetrical geometries such as plates, cylinders, and spheres.
- Examine multi-dimensional systems.
- Use numerical methods by hand and with computers to solve unsteady conduction problems.
- Apply concepts of chapter to design applications.

Principles of Convection

- Review the concept of fluid viscosity.
- Examine the concept of velocity boundary layer.
- Examine the concept of thermal boundary layer.
- Study the analogy between fluid friction and heat transfer.

External Forced Convection

- Determine heat transfer rates for flows over plates and cylinders.
- Determine heat transfer rates for flows over spheres.
- Determine heat transfer rates for flows through tube banks.
- Apply concepts of chapter to design applications.

Internal Forced Convection

- Review concepts of flow rate and Reynolds number.
- Examine velocity and thermal boundary layers.
- Examine friction factor and pressure drop.
- Apply the concept of thermal energy balance.
- Determine heat-transfer coefficients for laminar flow.
- Determine heat-transfer coefficients for turbulent flow.
- Apply concepts of chapter to design applications.

Natural Convection

- Review key physical concepts of natural convection

Determine film coefficients for free convection over plates.
Determine film coefficients for free convection over cylinders.
Determine film coefficients for free convection over spheres.
Determine film coefficients for free convection through various internal flow configurations.
Examine combined natural and forced convection.
Apply concepts of chapter to design applications.

Heat Exchangers

Describe various types of heat exchangers.
Determine the overall heat-transfer coefficient for a heat exchanger.
Analyze heat exchangers using the log-mean-temperature-difference method.
Analyze heat-exchangers using the effectiveness NTU method
Examine heat-transfer enhancement methods.
Select and design heat exchangers for specific applications.

Radiation

Review physical concepts associated with radiation heat-transfer.
Examine blackbody radiation.
Examine radiation properties of surfaces.
Determine view factor for various geometries.
Determine radiation heat-transfer between surfaces.
Examine the radiation effects on temperature measurement.
Analyze combined radiation and convection problems.
Examine environnemental radiation.
Apply concepts of chapter to design applications.

Boiling and Condensation

Examine pool boiling.
Examine forced convection boiling.
Examine condensations.
Examine heat pipes.
Apply concepts of chapter to design applications.

Design Problems/Projects

Provide solutions to practical design problems throughout the course.
Submit a design project at the end of the semester.

Computer/Internet Applications

Use computer spreadsheets or other means to solve problems when appropriate.
Examine Internet resources for heat transfer.

Exams and Evaluation

Take hourly exams and/or quizzes as assigned.
Complete daily assignments.
Complete a final exam.

APPENDIX E. - TracDat Reports

Assessment Impact by Unit Objectives
Assessment Plan
Unit Course Assessment Report
Unit Assessment Report
Curriculum Map

Assessment Impact by Unit Objectives

Ferris State University

Program - Mechanical Engineering Technology (B.S.)

Program - Mechanical Engineering Technology (B.S.)

Mission Statement: The Mechanical Engineering Technology program seeks to provide a stimulating learning environment to prepare students for the broad array of technical careers associated with the discipline.
Advisory Board/Committee Meetings: Once per year
Next FSU Academic Program Review: 2010-2011
Accreditation Body: Technology Accreditation Commission - Accreditation Board for Engineering & Technology (TAC-ABET)
Academic Year of Next Accreditation Review: 2010-2011
College: CET

Outcome: Problem Solving

Student will be able to apply engineering principles to complex technical problems

Outcome Type: Learning
Start Date: 01/12/2009
End Date: 05/08/2009
Outcome Status: Active

Means of Assessment

Assessment Method	Criterion for Success	Assessment Schedule	Active
Evaluation of students projects by Instructor, other faculty and Advisory Board. **Assessment Method Category:** Case Studies/Problem-based Assignments **Related Documents:** MECH 499 Outline	Success rate of 80% or better	Annually Spring Term	Yes

Related Courses

* MATL 240 - Intro to Material Science
* MATL 341 - Material Selection Metals
* MECH 311 - Finite Elem Analysis/Modeling
* MECH 330 - Heat Transfer
* MECH 332 - Mech Measurements/Mechatronics
* MECH 360 - Dynamics
* MECH 421 - MET Senior Lab
* MECH 440 - Noise and Vibrations
* MECH 499 - MET Senior Project
* MFGE 341 - Quality Science Statistics
* MFGE 423 - Engineering Economics
* PHYS 212 - Introductory Physics 2

Results

Result	Action	Follow-Up	Action
Case Studies/Problem-based Assignments - 10/07/2009 - Student Self Assessment that they completed a capstone project, which includes solving a complex problem Spring 2005 - 79.2% Spring 2006 - 88.9% Spring 2007 - 80.6% Spring 2008 - 86.1%			1 - No Action Required

Results			
Result	**Action**	**Follow-Up**	**Action**
Spring 2009 - 85.9% **Classification:** Criterion Met **Related Documents:** MECH 499 data			
Case Studies/Problem-based Assignments - 10/07/2009 - Advisory Board Evaluation Spring 2005 - 61.7% Spring 2006 - Spring 2007 65.8 Spring 2008 - 71.1% Spring 2009 - 75.0% **Classification:** Criterion Not Met **Related Documents:** MECH 499 data			2 - Pending Action
Case Studies/Problem-based Assignments - 10/07/2009 - Other Faculty Evaluation Spring 2005 - 60.0% Spring 2006 - 57.1 Spring 2007 Spring 2008 - 65.9% Spring 2009 - 73.7% **Classification:** Criterion Not Met **Related Documents:** MECH 499 data			1 - No Action Required
Case Studies/Problem-based Assignments - 10/07/2009 - Instructor Evaluation Spring 2005 - 73.2% Spring 2006 - 69.0% Spring 2007 Spring 2008 - 82.1% Spring 2009 - 92.2% **Classification:** Criterion Met **Related Documents:** MECH 499 data			1 - No Action Required

Outcome: Capstone Project

Student will be able to carry out a capstone engineering project involing design, testing, analysis, presentation and reporting.

Start Date: 08/30/2004
End Date: 05/07/2010
Outcome Status: Active

Means of Assessment			
Assessment Method	**Criterion for Success**	**Assessment Schedule**	**Active**
Evaluation of project by Instructor **Assessment Method Category:** Project/Model/Invention	80% success rating expected	Every Spring	Yes
Advisory Board members review projects with students. **Assessment Method Category:** Project/Model/Invention	80% success rating	Every Spring	Yes

Means of Assessment			
Assessment Method	**Criterion for Success**	**Assessment Schedule**	**Active**
Other faculty reviews of project presentations **Assessment Method Category:** Project/Model/Invention	80% success rate expected.	Every Spring	Yes

Related Courses

* ENGL 311 - Advanced Technical Writing
* MECH 393 - Industrial Internship
* MECH 421 - MET Senior Lab
* MECH 499 - MET Senior Project

Results			
Result	**Action**	**Follow-Up**	**Action**
Project/Model/Invention - 10/22/2009 - Students Self Evaluation Spring 05 - 79.4% Spring 06 - 81.6% Spring 07 - 78.8% Spring 08 - 84.9% Spring 09 - 85.5% **Classification:** Criterion Met			1 - No Action Required

Outcome: Communication

Students will be able to use a variety of media to communicate effectively with diverse audiences.

Outcome Type: Learning
Start Date: 01/12/2009
End Date: 05/01/2009
Outcome Status: Active

Means of Assessment			
Assessment Method	**Criterion for Success**	**Assessment Schedule**	**Active**
Student will prepare a formal presentation to a diverse audience for evaluation **Assessment Method Category:** Presentation(Oral) **Related Documents:** MECH 499 Outline	Student will successfully present a report on the problem, methods used, analysis, solution and improvements or revisions recommended using oral and visual media with a 80% achievement of success.	Presentations made at end semester when student completes senior project in MECH 499.	Yes

Related Courses

* ENGL 311 - Advanced Technical Writing
* MECH 332 - Mech Measurements/Mechatronics
* MECH 499 - MET Senior Project

Results			
Result	**Action**	**Follow-Up**	**Action**
Presentation(Oral) - 05/08/2009 - Assessment by other Faculty Spring 05 - 70.7% Spring 06 - 61.1% Spring 08 - 60.8% Spring 09 - 71.1%			1 - No Action Required

Results			
Result	**Action**	**Follow-Up**	**Action**

Classification:
Criterion Not Met

Related Documents:
MECH 499 data

Presentation(Oral) - 05/08/2009 - Assessment from the Project Report - By the Instructor Spring 05 - 77.1%- Spring 06 - 86.1% " Spring 07 - 83.3% " Spring 08 - 91.7% " Spring 09 - 84.4% " **Classification:** Criterion Met **Related Documents:** MECH 499 data		1 - No Action Required

Outcome: Team Work

Student will demonstrate ability to work on teams.

Outcome Type: Learning
Outcome Status: Active

Means of Assessment			
Assessment Method	**Criterion for Success**	**Assessment Schedule**	**Active**
Student will be able to recognize the importance of teamwork in problem solving. **Assessment Method Category:** Internship Evaluation	A review rating of 90% or higher	Typically summer between Junior/Senior year.	Yes
Survey of students upon completion of course **Assessment Method Category:** Survey - Students	75% success rate	Annually	Yes

Related Courses

* MECH 332 - Mech Measurements/Mechatronics
* MECH 393 - Industrial Internship
* MECH 421 - MET Senior Lab

Results			
Result	**Action**	**Follow-Up**	**Action**
Survey - Students - 10/07/2009 - Student Survey - Self Assessment Fall 2004 - 73.3% Fall 2005 - 86.7% Fall 2006 - 80.6% Fall 2007 - 83.3% **Classification:** Criterion Met **Related Documents:** MECH 421 Assessment			1 - No Action Required

Results			
Result	**Action**	**Follow-Up**	**Action**
MECH 421 Assessment form			

Outcome: Modern Tools of discipline

Student will demonstrate the proficiency in modern tools of the discipline.

Outcome Type: Learning
Start Date: 08/30/2004
End Date: 05/08/2009
Outcome Status: Active

Means of Assessment			
Assessment Method	**Criterion for Success**	**Assessment Schedule**	**Active**
Student will be able to categorize the steps of a project and document this in a graphic form. **Assessment Method Category:** Project/Model/Invention **Related Documents:** MECH 499 Outline	80% Success Rate	Annually every Spring	Yes
Faculty grades **Assessment Method Category:** Survey - Faculty	80% Success Rate	Annualy every Spring	Yes

Related Courses

* MECH 322 - Computer Applic 2 for MET
* MECH 332 - Mech Measurements/Mechatronics
* MECH 393 - Industrial Internship
* MECH 421 - MET Senior Lab
* MECH 499 - MET Senior Project

Results			
Result	**Action**	**Follow-Up**	**Action**
Survey - Faculty - 10/07/2009 - Faculty Grade Spring 2005 - 60.0% Spring 2006 - 63.5% Spring 2007 - 75.6% Spring 2008 - 72.9% Spring 2009 - 81.4% **Classification:** Criterion Met **Related Documents:** MECH 499 data MECH 499 data			1 - No Action Required

Outcome: Ethics

Student will demonstrate understanding of ethical issues in the discipline

Outcome Type: Learning
Outcome Status: Active

Means of Assessment			
Assessment Method	**Criterion for Success**	**Assessment Schedule**	**Active**

Means of Assessment			
Assessment Method	**Criterion for Success**	**Assessment Schedule**	**Active**
Students will be able to identify ethical issues and appraise their positions on these. **Assessment Method Category:** Test - Internally Developed - Pre/Post or Post **Related Documents:** MECH 499 Outline	A 80% success rate	During MECH 499 course	Yes

Related Courses

* MECH 499 - MET Senior Project

Results			
Result	**Action**	**Follow-Up**	**Action**
Test - Internally Developed - Pre/Post or Post - 09/18/2009 - Students Self assessments Spring 05 - 41.4% Spring 06 - 20.0% Spring 07 - 20.0% Spring 08 - 20.0% Spring 09 - 20.0% **Classification:** Criterion Not Met **Change Assessment Strategy:** Yes **Professional Development Required:** Yes **Related Documents:** MECH 499 data Ethics Summary	10/22/2009 - Review materials used and method of assessment used to determine what is happening to students understanding of ethics.		2 - Pending Action

Outcome: Diversity and globalization

Student will be able to relate issues in diversity and globalization to their discipline.

Outcome Type: Learning
Start Date: 08/30/2004
Outcome Status: Active

Means of Assessment			
Assessment Method	**Criterion for Success**	**Assessment Schedule**	**Active**
Quiz in MECH 499 **Assessment Method Category:** Test - Internally Developed - Pre/Post or Post **Related Documents:** Globalization Data	80% Success Rate Expected	Every Spring	Yes

Related Courses

* MECH 499 - MET Senior Project

Results			
Result	**Action**	**Follow-Up**	**Action**
Test - Internally Developed - Pre/Post or Post - 10/23/2009 - Quiz Data Spring 2006 - 80% Spring 2007 - 79% Spring 2008 - 95%			1 - No Action Required

Results			
Result	**Action**	**Follow-Up**	**Action**
Spring 2009 - 87% **Classification:** Criterion Met **Related Documents:** Globalization Data			
10/22/2009 - Diversity assessment quiz from Legal Services used. The quiz was more educational in nature than useful as an assessment tool. Questions dealt with detailed knowledge of statistics on various populations. Scores were typically 1-3 out of 10. A copy will be available. Other means of assessment were sought. Spring 09 - 64 **Classification:** Criterion Met **Related Documents:** Diversity Diversity Rubric	10/22/2009 - Conclusion: Unless a better means of assessment comes up, continue with this means.Target to be established after several years.		2 - Pending Action

Outcome: Continuing Education

Student will understand the need and options to continue life long learning in the engineering field.

Outcome Type: Learning
Outcome Status: Active

Means of Assessment			
Assessment Method	**Criterion for Success**	**Assessment Schedule**	**Active**
Students will be evaluated on a graduate survey to determine hteir education after graduation. **Assessment Method Category:** Survey - Alumni (after one year)	Students pursue additional education.	June	Yes
Student will be able to describe the importance of continuing education. **Assessment Method Category:** Test - Internally Developed - Pre/Post or Post	A 90% understanding of the need for continuinmg educatyion.	Spring term in MECH 499.	Yes

Related Courses

* MECH 393 - Industrial Internship
* MECH 499 - MET Senior Project

Results			
Result	**Action**	**Follow-Up**	**Action**
No Results reported.			

Outcome: Problems in industry

Student will be able to relate their education to problems in industry.

Outcome Type: Learning
Start Date: 08/30/2004
End Date: 05/07/2010
Outcome Status: Active

Means of Assessment			
Assessment Method	**Criterion for Success**	**Assessment Schedule**	**Active**
Employer evaluation **Assessment Method Category:** Internship Evaluation	Rating of 80% or better	Summer between Junior and Senior year.	Yes

Related Courses

* MECH 311 - Finite Elem Analysis/Modeling
* MECH 322 - Computer Applic 2 for MET
* MECH 332 - Mech Measurements/Mechatronics
* MECH 393 - Industrial Internship
* MECH 421 - MET Senior Lab
* MECH 499 - MET Senior Project

Results			
Result	**Action**	**Follow-Up**	**Action**
No Results reported.			

Assessment Plan

Ferris State University

Program - Mechanical Engineering Technology (B.S.)

Program - Mechanical Engineering Technology (B.S.)

Mission Statement: The Mechanical Engineering Technology program seeks to provide a stimulating learning environment to prepare students for the broad array of technical careers associated with the discipline.
Advisory Board/Committee Meetings: Once per year
Next FSU Academic Program Review: 2010-2011
Accreditation Body: Technology Accreditation Commission - Accreditation Board for Engineering & Technology (TAC-ABET)
Academic Year of Next Accreditation Review: 2010-2011
College: CET

Outcome: Problem Solving

Student will be able to apply engineering principles to complex technical problems

Outcome Type: Learning
Start Date: 01/12/2009
End Date: 05/08/2009
Outcome Status: Active

Means of Assessment

Assessment Method	Criterion for Success	Assessment Schedule	Active
Evaluation of students projects by Instructor, cther faculty and Advisory Board. **Assessment Method Category:** Case Studies/Problem-based Assignments **Related Documents:** MECH 499 Outline	Success rate of 80% or better	Annually Spring Term	Yes

Related Courses

* MATL 240 - Intro to Material Science
* MATL 341 - Material Selection Metals
* MECH 311 - Finite Elem Analysis/Modeling
* MECH 330 - Heat Transfer
* MECH 332 - Mech Measurements/Mechatronics
* MECH 360 - Dynamics
* MECH 421 - MET Senior Lab
* MECH 440 - Noise and Vibrations
* MECH 499 - MET Senior Project
* MFGE 341 - Quality Science Statistics
* MFGE 423 - Engineering Economics
* PHYS 212 - Introductory Physics 2

Related Goals

ABET: TAC General Criteria

* a. An appropriate mastery of the knowledge, techniques, skills, and modern tools of their disciplines.
* b. An ability to apply current knowledge and adapt to emerging applications of mathematics, science, engineering, and technology.
* f. An ability to identify, analyze and solve technical problems.
* i. An ability to understand professional, ethical and social responsibilities.

Outcome: Capstone Project

Student will be able to carry out a capstone engineering project involing design, testing, analysis, presentation and reporting.

Start Date: 08/30/2004
End Date: 05/07/2010
Outcome Status: Active

Means of Assessment

Assessment Method	Criterion for Success	Assessment Schedule	Active
Evaluation of project by Instructor **Assessment Method Category:** Project/Model/Invention	80% success rating expected	Every Spring	Yes
Advisory Board members review projects with students. **Assessment Method Category:** Project/Model/Invention	80% success rating	Every Spring	Yes
Other faculty reviews of project presentations **Assessment Method Category:** Project/Model/Invention	80% success rate expected.	Every Spring	Yes

Related Courses

* ENGL 311 - Advanced Technical Writing
* MECH 393 - Industrial Internship
* MECH 421 - MET Senior Lab
* MECH 499 - MET Senior Project

Related Goals

ABET: TAC General Criteria

* a. An appropriate mastery of the knowledge, techniques, skills, and modern tools of their disciplines.
* b. An ability to apply current knowledge and adapt to emerging applications of mathematics, science, engineering, and technology.
* c. An ability to conduct, analyze and interpret experiments, and apply experimental results to improve processes.
* d. An ability to apply creativity in the design of systems, components, or processes appropriate to program educational objectives.
* f. An ability to identify, analyze and solve technical problems.
* g. An ability to communicate effectively.
* i. An ability to understand professional, ethical and social responsibilities.
* j. A respect for diversity and a knowledge of contemporary professional, societal and global issues.

Outcome: Communication

Students will be able to use a variety of media to communicate effectively with diverse audiences.

Outcome Type: Learning
Start Date: 01/12/2009
End Date: 05/01/2009
Outcome Status: Active

Means of Assessment

Assessment Method	Criterion for Success	Assessment Schedule	Active
Student will prepare a formal presentation to a diverse audience for evaluation **Assessment Method Category:** Presentation(Oral) **Related Documents:** MECH 499 Outline	Student will successfully present a report on the problem, methods used, analysis, solution and improvements or revisions recommended using oral and visual media with a 80% achievement of success.	Presentations made at end semester when student completes senior project in MECH 499.	Yes

Related Courses

* ENGL 311 - Advanced Technical Writing
* MECH 332 - Mech Measurements/Mechatronics
* MECH 499 - MET Senior Project

Related Goals

ABET: TAC General Criteria

* g. An ability to communicate effectively.

Accreditation - Higher Learning Commission

* Criterion Three - Student Learning and Effective Teaching
  Core Component - 3A
  The organization's goals for student learning outcomes are clearly stated for each educational program and make effective assessment possible.
* Criterion Three - Student Learning and Effective Teaching
  Core Component - 3D
  The organization's learning resources support student learning and effective teaching.
* Criterion Four - Acquistion, Discovery, and Application of Knowledge
  Core Component - 4D
  The organization provides support to ensure that faculty, students, and staff acquire, discover, and apply knowledge responsibly.

Outcome: Team Work

Student will demonstrate ability to work on teams.

Outcome Type: Learning
Outcome Status: Active

Means of Assessment

Assessment Method	Criterion for Success	Assessment Schedule	Active
Student will be able to recognize the importance of teamwork in problem solving. **Assessment Method Category:** Internship Evaluation	A review rating of 90% or higher	Typically summer between Junior/Senior year.	Yes
Survey of students upon completion of course **Assessment Method Category:** Survey - Students	75% success rate	Annually	Yes

Related Courses

* MECH 332 - Mech Measurements/Mechatronics
* MECH 393 - Industrial Internship
* MECH 421 - MET Senior Lab

Related Goals

ABET: TAC General Criteria

* e. An ability to function effectively on teams.

Outcome: Modern Tools of discipline

Student will demonstrate the proficiency in modern tools of the discipline.

Outcome Type: Learning
Start Date: 08/30/2004
End Date: 05/08/2009
Outcome Status: Active

Means of Assessment

Assessment Method	Criterion for Success	Assessment Schedule	Active

Means of Assessment			
Assessment Method	**Criterion for Success**	**Assessment Schedule**	**Active**
Student will be able to categorize the steps of a project and document this in a graphic form. **Assessment Method Category:** Project/Model/Invention **Related Documents:** MECH 499 Outline	80% Success Rate	Annually every Spring	Yes
Faculty grades **Assessment Method Category:** Survey - Faculty	80% Success Rate	Annualy every Spring	Yes

Related Courses

* MECH 322 - Computer Applic 2 for MET
* MECH 332 - Mech Measurements/Mechatronics
* MECH 393 - Industrial Internship
* MECH 421 - MET Senior Lab
* MECH 499 - MET Senior Project

Related Goals

ABET: TAC General Criteria

* a. An appropriate mastery of the knowledge, techniques, skills, and modern tools of their disciplines.
* f. An ability to identify, analyze and solve technical problems.

Outcome: Ethics

Student will demonstrate understanding of ethical issues in the discipline

Outcome Type: Learning
Outcome Status: Active

Means of Assessment			
Assessment Method	**Criterion for Success**	**Assessment Schedule**	**Active**
Students will be able to identify ethical issues and appraise their positions on these. **Assessment Method Category:** Test - Internally Developed - Pre/Post or Post **Related Documents:** MECH 499 Outline	A 80% success rate	During MECH 499 course	Yes

Related Courses

* MECH 499 - MET Senior Project

Related Goals

ABET: TAC General Criteria

* i. An ability to understand professional, ethical and social responsibilities.

Outcome: Diversity and globalization

Student will be able to relate issues in diversity and globalization to their discipline.

Outcome Type: Learning
Start Date: 08/30/2004
Outcome Status: Active

Means of Assessment			
Assessment Method	**Criterion for Success**	**Assessment Schedule**	**Active**

Means of Assessment			
Assessment Method	**Criterion for Success**	**Assessment Schedule**	**Active**
Quiz in MECH 499 **Assessment Method Category:** Test - Internally Developed - Pre/Post or Post **Related Documents:** Globalization Data	80% Success Rate Expected	Every Spring	Yes

Related Courses

* MECH 499 - MET Senior Project

Related Goals

ABET: TAC General Criteria

* j. A respect for diversity and a knowledge of contemporary professional, societal and global issues.

Outcome: Continuing Education

Student will understand the need and options to continue life long learning in the engineering field.

Outcome Type: Learning
Outcome Status: Active

Means of Assessment			
Assessment Method	**Criterion for Success**	**Assessment Schedule**	**Active**
Students will be evaluated on a graduate survey to determine hteir education after graduation. **Assessment Method Category:** Survey - Alumni (after one year)	Students pursue additional education.	June	Yes
Student will be able to describe the importance of continuing education. **Assessment Method Category:** Test - Internally Developed - Pre/Post or Post	A 90% understanding of the need for continuinmg educatyion.	Spring term in MECH 499.	Yes

Related Courses

* MECH 393 - Industrial Internship
* MECH 499 - MET Senior Project

Related Goals

ABET: TAC General Criteria

* h. A recognition of the need for, and an ability to engage in lifelong learning.

Outcome: Problems in industry

Student will be able to relate their education to problems in industry.

Outcome Type: Learning
Start Date: 08/30/2004
End Date: 05/07/2010
Outcome Status: Active

Means of Assessment			
Assessment Method	**Criterion for Success**	**Assessment Schedule**	**Active**
Employer evaluation **Assessment Method Category:** Internship Evaluation	Rating of 80% or better	Summer between Junior and Senior year.	Yes

Related Courses

* MECH 311 - Finite Elem Analysis/Modeling
* MECH 322 - Computer Applic 2 for MET
* MECH 332 - Mech Measurements/Mechatronics
* MECH 393 - Industrial Internship
* MECH 421 - MET Senior Lab
* MECH 499 - MET Senior Project

Related Goals

ABET: TAC General Criteria

* a. An appropriate mastery of the knowledge, techniques, skills, and modern tools of their disciplines.
* e. An ability to function effectively on teams.
* g. An ability to communicate effectively.

Unit Course Assessment Report

Ferris State University
Z - MECH Courses

Course Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
Z - MECH Courses - MECH 111 - MET Seminar - Understanding Engineering and Engineering technology - Students will understand difference between Engineering and Engineering Technology and understand goals of MET Program. 80% Success Rate expected **Start Date:** 08/30/2004 **End Date:** 12/18/2009 **Outcome Status:** Active	**Assessment Method:** Student Surveys **Assessment Method Category:** Survey - Students **Criterion for Success:** 80% success rate expected **Related Documents:** MECH 111 Assessment Form	10/15/2009 - Student Evaluation Fall 04 - Fall 05 - 91.3% **Classification:** Criterion Met **Action:** 1 - No Action Required	
Z - MECH Courses - MECH 111 - MET Seminar - Problem solving - Students will apply the creative problem solving model 80% Success Rate expected **Start Date:** 08/30/2004 **Outcome Status:** Active		10/15/2009 - Student Evaluation Spring 05 - 86% **Classification:** Criterion Met **Action:** 1 - No Action Required **Related Documents:** MECH 111 Assessment Form 10/15/2009 - Instructor Rating Fall 04 - 100% Fall 05 - **Classification:** Criterion Met **Action:** 1 - No Action Required	
Z - MECH Courses - MECH 111 - MET Seminar - Ethics - Students will have an understanding of the issues in ethics related	**Assessment Method:** Students will be able to relate issues in ethics to the discipline.	10/15/2009 - Instructor Rating Fall 05 - 97.9%	

Course Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
to the discipline. 80% Success Rate expected. **Start Date:** 08/30/2004 **Outcome Status:** Active	**Criterion for Success:** A success rate of 85% is expected. **Related Documents:** MECH 111 Assessment Form	**Classification:** Criterion Met **Action:** 1 - No Action Required 10/15/2009 - Student Evaluation Fall 05 - 92.7% **Classification:** Criterion Met **Action:** 1 - No Action Required	
Z - MECH Courses - MECH 111 - MET Seminar - Teamwork - Students will demonstrate teamwork principles in a small group project. 80% Success Rate expected **Start Date:** 08/30/2004 **Outcome Status:** Active		10/15/2009 - Student Evaluation Spring 05 - 96% **Classification:** Criterion Met **Action:** 1 - No Action Required 10/15/2009 - Instructor rating Fall 05 - 100% **Classification:** Criterion Met **Action:** 1 - No Action Required	
Z - MECH Courses - MECH 122 - Computer Applications in Tech - Word Processing - Student will be able to demonstrate proficiency in Word Processing 80% Success rate expected **Start Date:** 08/29/2005 **Outcome Status:** Active	**Assessment Method:** Student Self Assessment **Assessment Method Category:** Survey - Students **Criterion for Success:** 80% success expected **Related Documents:** MECH 122 Assessment Form **Assessment Method:** Instructor Evaluation **Assessment Method Category:** Case Studies/Problem-based Assignments **Criterion for Success:** 80% success rate		

Course Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
	Related Documents: MECH 122 Assessment Form		
		05/11/2010 - Instructor Rating Spring 05 - 91.1% Spring 09 - 99.5% Spring 10 - 93% **Classification:** Criterion Met **Action:** 1 - No Action Required	
		10/14/2009 - Student Self Evaluation Spring 2006 - 83% Spring 2007 - 93% Spring 2009 - 85% **Classification:** Criterion Met **Action:** 1 - No Action Required **Related Documents:** MECH 122 Assessment Form MEC H 122 MECH 122 MECH 122	
Z - MECH Courses - MECH 122 - Computer Applications in Tech - Electronic Spreadsheets - Student will be able to solve problems with Electronic Spreadsheets 80% success rate expected **Start Date:** 08/29/2005 **Outcome Status:** Active	**Assessment Method:** Student Self Evaluation **Assessment Method Category:** Survey - Students **Criterion for Success:** 80% success expected		
	Assessment Method: Instructor Evaluation **Assessment Method Category:** Case Studies/Problem-based Assignments **Criterion for Success:** 80% success expected **Related Documents:** MECH 122 Assessment Form		

Course Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
		05/11/2010 - Instructor Rating Spring 05 - 86.2% Spring 10 - 89% **Classification:** Criterion Met **Action:** 1 - No Action Required	
		10/14/2009 - Student Self Evaluation Spring 2006 - 83% Spring 2007 - 90% Spring 2009 - 82% **Classification:** Criterion Met **Action:** 1 - No Action Required **Related Documents:** MECH 122 Assessment Form MEC H 122 MECH 122 MECH 122	
Z - MECH Courses - MECH 122 - Computer Applications in Tech - Presentation - Student will be able give an oral presentation enhanced with visual media. 80% success rate expected. **Start Date:** 08/29/2005 **Outcome Status:** Active	**Assessment Method:** Student Self Evaluation **Assessment Method Category:** Survey - Students **Criterion for Success:** 80% success expected **Related Documents:** MECH 122 Assessment Form		
	Assessment Method: Instructor Evaluation **Assessment Method Category:** Case Studies/Problem-based Assignments **Criterion for Success:** 80% success expected **Related Documents:** MECH 122 Assessment Form		
		05/11/2010 - Instructor Rating	

Course Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
		Spring 05 - 89.3% Spring 10 - 95% **Classification:** Criterion Met **Action:** 1 - No Action Required	
		10/14/2009 - Student Self Evaluation Spring 2006 - 84% Spring 2007 - 86% Spring 2009 - 84% **Classification:** Criterion Met **Action:** 1 - No Action Required **Related Documents:** MECH 122 Assessment Form MEC H 122 MECH 122 MECH 122	
Z - MECH Courses - MECH 211 - Fluid Mechanics - Team work - Student will be able to function in teams to complete weekly lab assignments including reports 80% Success Rated Expected **Start Date:** 08/23/2004 **Outcome Status:** Active	**Assessment Method:** Students will be evaluated based on weekly lab reports completed in teams. **Assessment Method Category:** Case Studies/Problem-based Assignments **Criterion for Success:** 80% success rate expected **Related Documents:** MECH 212 Assessment Form	01/13/2006 - Student Evaluations Fall 2005 - 91.9% Instructor Evaluation Fall 2005 - 96% **Classification:** Criterion Met **Action:** 1 - No Action Required **Related Documents:** MECH 211 Assess Fall 2005	
Z - MECH Courses - MECH 211 - Fluid Mechanics - Energy Equation - Student will be able to solve fluid flow problems using the general energy equation. **Start Date:** 08/23/2004 **Outcome Status:**	**Assessment Method:** Exam 2, problems **Assessment Method Category:** Test - Internally Developed - Pre/Post or Post **Criterion for Success:** Successful score is 80%	10/21/2009 - Fall 2005 - 79.2% **Classification:** Inconclusive **Action:** 1 - No Action Required **Related Documents:**	

Course Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
Active		MECH 211 Assess Fall 2005 MECH 211 Assessment Form	
	Assessment Method: Student Self Assessment Survey **Assessment Method Category:** Survey - Students **Criterion for Success:** 80% Success rate Expected.	12/16/2005 - Fall 2005 - 84.7% **Classification:** Criterion Met **Action:** 1 - No Action Required **Related Documents:** MECH 211 Assess Fall 2005	
Z - MECH Courses - MECH 211 - Fluid Mechanics - Fluid system design - Student will be able to function in teams to design a fluid system involving piping and pump(s). **Outcome Status:** Active	**Assessment Method:** Student design project grade **Assessment Method Category:** Project/Model/Invention **Criterion for Success:** 75% Success rate expected **Related Documents:** MECH 211 Assessment Form	10/21/2009 - Fall 2005 - 76% **Classification:** Inconclusive **Action:** 1 - No Action Required	
	Assessment Method: Student Survey **Assessment Method Category:** Survey - Students **Criterion for Success:** 75% success rate expected	12/09/2005 - Fall 2005 - 80.6% **Classification:** Criterion Met **Action:** 1 - No Action Required **Related Documents:** MECH 211 Assess Fall 2005 MECH 211 Assessment Form	
Z - MECH Courses - MECH 212 - Kinematics of Mechanisms - Positional mechanism - Student will be able to solve mechanism positioning problems using graphical and mathematical means. 80% Success Rate **Start Date:** 08/28/2006 **End Date:** 05/07/2010 **Outcome Status:** Active	**Assessment Method:** Student Assessment using Assessment **Assessment Method Category:** Survey - Students **Criterion for Success:** 80% Success expected		
		10/12/2009 - Student Self Evaluations Spring 05 - 83% Spring 07 - 92% Spring 08 - 91%	

Course Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
		Spring 09 - 90% Instructor Spring 05 - 84.4% **Classification:** Criterion Met **Action:** 1 - No Action Required **Related Documents:** MECH212 MECH 212 MECH 212 MECH 212 Assessment Form	
Z - MECH Courses - MECH 212 - Kinematics of Mechanisms - Velocity Problems - Student will be able to solve velocity problems using graphical and mathematical means. **Start Date:** 08/28/2006 **End Date:** 05/07/2010 **Outcome Status:** Active		10/12/2009 - Student Self Evaluation Spring 07 - 88% Spring 08 - 89% Spring 09 - 89% **Classification:** Criterion Met **Action:** 1 - No Action Required **Related Documents:** MECH 212 Assessment Form MECH212 MECH 212 MECH 212	
Z - MECH Courses - MECH 212 - Kinematics of Mechanisms - Acceleration analysis - Student will be able preform acceleration analysis using graphical means. 80% Success Rqate **Start Date:** 08/28/2006 **End Date:** 05/07/2010 **Outcome Status:** Active		10/12/2009 - Student Self Evaluations Spring 07 - 79% Spring 08 - 82% Spring 09 - 51% **Classification:** Criterion Not Met **Action:** 2 - Pending Action **Professional Development Required:**	

Course Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
		Yes **Related Documents:** MECH 212 Assessment Form MECH212 MECH 212 MECH 212	
Z - MECH Courses - MECH 212 - Kinematics of Mechanisms - Cam Profiles - Student will be able to design simple cam profiles using graphical means. 80% Success Rate. **Start Date:** 08/28/2006 **End Date:** 05/07/2010 **Outcome Status:** Active		10/12/2009 - Student Self Assessment Spring 07 - 80% Spring 08 - 91% Spring 09 - 76% **Classification:** Inconclusive **Action:** 2 - Pending Action **Related Documents:** MECH 212 Assessment Form MECH212 MECH 212 MECH 212	
Z - MECH Courses - MECH 221 - Mech Measure-Computer Appl - Course Number Change - Course has been changed to MECH 332	**Assessment Method:** Student Survey **Assessment Method Category:** Survey - Students **Criterion for Success:** 75% Success Rate Expected **Related Documents:** MECH 221		
Z - MECH Courses - MECH 221 - Mech Measure-Computer Appl - Senors Circuits - Student will be able to demonstrate understanding of sensor operation, basic circuits and operational amplifiers.	**Assessment Method:** Student Survey **Assessment Method Category:** Survey - Students **Criterion for Success:** 75% success rate expected **Related Documents:** MECH 212 Assessment Form		

Course Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
	Assessment Method: Homework **Assessment Method Category:** Case Studies/Problem-based Assignments **Criterion for Success:** 75% success expected		
		10/21/2009 - Student Evaluations Spring 2005 - 75% **Classification:** Criterion Met **Action:** 1 - No Action Required **Related Documents:** MECH 221	
		05/13/2005 - Instructor Evaluation Spring 05 - 88.7% **Classification:** Criterion Met **Action:** 1 - No Action Required **Related Documents:** MECH 221 MECH 221	
Z - MECH Courses - MECH 221 - Mech Measure-Computer Appl - Team work - Student will be able to function in teams to complete weekly lab assignments including reports		10/21/2009 - Student Evaluation Spring - 75% **Classification:** Criterion Met **Action:** 1 - No Action Required **Related Documents:** MECH 221 MECH 221	
Z - MECH Courses - MECH 221 - Mech Measure-Computer Appl - Transducers - Student will be able to construct and calibrate a transducer or equivalent unique project.		10/21/2009 - Student Evaluations Spring 05 - 73.3% Instructor Evaulation	

Course Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
		Spring 05 - 4.9% **Classification:** Criterion Met **Action:** 1 - No Action Required **Related Documents:** MECH 221 MECH 221	
Z - MECH Courses - MECH 221 - Mech Measure-Computer Appl - Documentation & Presentation - Student will be able to document, present, and evaluate project.		10/21/2009 - Student Evaluations Spring 05 - 87.1% Instructor Evaluations Spring 05 - 95% **Classification:** Criterion Met **Action:** 1 - No Action Required **Related Documents:** MECH 221	
Z - MECH Courses - MECH 222 - Machine Design - Buckling Analysis - Student will be able to use Johnson and Euler column buckling analysis as appropriate. 80% Success Rate expected **Start Date:** 08/28/2006 **End Date:** 05/07/2010 **Outcome Status:** Active		10/14/2009 - Instructor Evaluation Spring 2005 - 86.7% **Classification:** Criterion Met **Action:** 1 - No Action Required 10/12/2009 - Student Self Evaluations Spring 05 - 87.9% Spring 07 - 91% Spring 08 - 95% Spring 09 - 83% **Classification:** Criterion Met **Action:** 1 - No Action Required **Related Documents:** MECH 222 Assessment form	

Course Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
Z - MECH Courses - MECH 222 - Machine Design - Shaft sizing - Student will be able to size shafts for rotating machinery. 80% Success Rate expected **Start Date:** 08/29/2005 **End Date:** 05/05/2006 **Outcome Status:** No Longer an Outcome		10/14/2009 - Instructor Evaluation Spring 2005 - 83.6% **Classification:** Criterion Met **Action:** 1 - No Action Required **Related Documents:** MECH 222 MECH 222 MECh 222 10/12/2009 - Student Self Evaluation Spring 05 - 79% **Classification:** Criterion Met **Action:** 1 - No Action Required **Related Documents:** MECH 222 Assessment form	
Z - MECH Courses - MECH 222 - Machine Design - Bearing selection - Student will be able to discuss and select appropriate bearings for applications. 80% Success Rate expected **Start Date:** 08/28/2006 **End Date:** 05/07/2010 **Outcome Status:** Active			
Z - MECH Courses - MECH 222 - Machine Design - Belt, chain, gears - Student will be able to select appropriate belt, chain, and gear drives for rotating machinery. 80% Success Rate expected. **Start Date:** 08/28/2006		10/14/2009 - Student Self evaluation Spring 2007 - 91% Spring 2008 - 86% Spring 2009 - 83& **Classification:**	

Course Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
End Date: 05/07/2010 **Outcome Status:** Active		Criterion Met **Action:** 1 - No Action Required **Related Documents:** MECH 222 Assessment form MECH 222 MECH 222 MECh 222	
Z - MECH Courses - MECH 222 - Machine Design - Threaded Fasteners - Student will be able to select appropriate threaded fasteners and joint analysis. Effective 2007 80% success rate expected. **Start Date:** 08/27/2007 **End Date:** 05/07/2010 **Outcome Status:** Active		10/14/2009 - Student Self evaluation Spring 2007 - 82% Spring 2008 - 94% Spring 2009 - 83% **Classification:** Criterion Met **Action:** 1 - No Action Required	
Z - MECH Courses - MECH 223 - Thermodynamics - First Law of Thermodynamics - Student will be able to demonstrate understanding of the First Law of Thermodynamics 75% Success rate expected **Start Date:** 08/30/2004 **Outcome Status:** Active	**Assessment Method:** Student Self evaluations **Assessment Method Category:** Z - Other - specify **Criterion for Success:** Success Rate OF 80%	05/11/2010 - Student Self-Assessment: Spring 2005 -76%; Spring 2006 - 74%; Spring 2007 - 80%; Spring 2009 - 90%; Spring 2010 - 84% **Classification:** Criterion Met **Action:** 1 - No Action Required **Related Documents:** MECH 223 Assessment form	
		05/11/2010 - Instructor Assessment: Spring 2005 - 88.2%; Spring 2010 - 72% **Classification:**	

Course Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
		Criterion Met **Action:** 1 - No Action Required	
Z - MECH Courses - MECH 223 - Thermodynamics - Thermodynamic cycles - Student will be able to demonstrate understanding of fundamental Thermodynamic cycles. 75% Success rate expected **Start Date:** 08/30/2004 **Outcome Status:** Active		05/11/2010 - Instructor Assessment: Spring 2005 - 78.5%; Spring 2010 - 76% **Classification:** Criterion Not Met **Action:** 2 - Pending Action **Related Documents:** MECH 223 MECH 223 Assessment form	
		05/11/2010 - Student Self-Assessment: Spring 2005 - 88.2%; Spring 2006- 72%; Spring 2007 - 80%; Spring 2009 - 89%; Spring 2010 - 87% **Classification:** Criterion Met **Action:** 1 - No Action Required **Related Documents:** MECH 223 Assessment form	
Z - MECH Courses - MECH 223 - Thermodynamics - Teamwork - Student will be able to Function in teams to analyze a system with multiple variables 80% Success Rate expected **Start Date:** 08/30/2004 **Outcome Status:** Active	**Assessment Method:** Instructor Evaluation **Assessment Method Category:** Project/Model/Invention **Criterion for Success:** 80% Success Rate Expected		
	Assessment Method: Student Survey at end of Semester **Assessment Method Category:** Survey - Students		

Course Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
	Criterion for Success: 80% Success Rate Expected.		
		05/11/2010 - Instructor Assessment: Spring 2005 - 91.7%; Spring 2010 - 79% **Classification:** Criterion Met **Action:** 1 - No Action Required **Related Documents:** MECH 223 Assessment form MECH 223	
		05/11/2010 - Student Self-Assessment: Spring 2005 - 88.2%; Spring 2006 - 66%; Spring 2007 - 75%; Spring 2009 - 87%; Spring 2010 - 87% **Classification:** Criterion Met **Action:** 1 - No Action Required **Related Documents:** MECH 223 Assessment form	
Z - MECH Courses - MECH 223 - Thermodynamics - Presentation - Student will be able to write and present a study on a topic in thermodynamics. 80% Success rate expected. **Start Date:** 08/30/2004 **Outcome Status:** Active		05/11/2010 - Instructor Assessment: Spring 2005 - 91%; Spring 2010 - 83% **Classification:** Criterion Met **Action:** 1 - No Action Required **Related Documents:** MECH 223	
		05/11/2010 - Student Self-Assessment: Spring 2005 - 80%; Spring 2006 - 60%; Spring 2007 - 61%; Spring 2009 - 87%;	

Course Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
		Spring 2010 - 89% **Classification:** Criterion Met **Action:** 1 - No Action Required **Related Documents:** MECH 223 Assessment form MECH 223	
Z - MECH Courses - MECH 311 - Finite Elem Analysis/Modeling - Solids modeling - Student will develop an understanding of fundamental concepts in solids modeling. **Outcome Status:** Active	**Assessment Method:** Student Self Assessment **Assessment Method Category:** Survey - Students **Criterion for Success:** 80% success expected	10/22/2009 - Instructor Evaluation: Fall 2009 - 91% (modeling only) **Classification:** Inconclusive **Action:** 1 - No Action Required	
	Assessment Method: Instructor Evaluation **Assessment Method Category:** Case Studies/Problem-based Assignments **Criterion for Success:** 80% success expected		
Z - MECH Courses - MECH 311 - Finite Elem Analysis/Modeling - FEA - Student will develop an understanding of fundamental concepts in finite element analysis including element types, boundary conditions, analysis types, and solution **Outcome Status:** Active			
Z - MECH Courses - MECH 311 - Finite Elem Analysis/Modeling - Interpret and verify analysis results. - Student will demonstrate ability to interpret and verify analysis results. **Outcome Status:** Active			
Z - MECH Courses - MECH 311 - Finite			

Course Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
Analysis/Modeling - Software capabilities - Student will demonstrate software capability to optimize designs **Outcome Status:** Active			
Z - MECH Courses - MECH 322 - Computer Applic 2 for MET - Apply engineering principles to complex technical problems - Students will be able apply engineering principles to complex technical problems **Outcome Status:** Active			
Z - MECH Courses - MECH 322 - Computer Applic 2 for MET - Carry out a capstone engineering project - Student will be able to carry out a capstone engineering project involving design, testing, analysis, presentation, and reporting **Outcome Status:** Active			
Z - MECH Courses - MECH 322 - Computer Applic 2 for MET - 3. demonstrate communication skills, oral, written, and visual, including a formal oral presentation - Student will be able to demonstrate communication skills, oral, written, and visual, including a formal oral presentation **Outcome Status:** Active			
Z - MECH Courses - MECH 322 - Computer Applic 2 for MET - Demonstrate ability to work on teams - Student will be able to demonstrate ability to work on teams **Outcome Status:** Active			
Z - MECH Courses - MECH 322 - Computer Applic 2 for MET - Demonstrate proficiency in the modern tools of the discipline - Student will be able to demonstrate			

Course Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
proficiency in the modern tools of the discipline **Outcome Status:** Active			
Z - MECH Courses - MECH 322 - Computer Applic 2 for MET - Demonstrate understanding of ethical issues in their discipline - Students will be able to demonstrate understanding of ethical issues in their discipline **Outcome Status:** Active			
Z - MECH Courses - MECH 322 - Computer Applic 2 for MET - Relate issues in diversity and globalization to their discipline - Students will be able to relate issues in diversity and globalization to their discipline **Outcome Status:** Active			
Z - MECH Courses - MECH 322 - Computer Applic 2 for MET - Understand options to continue their education - Students will be able to understand options to continue their education **Outcome Status:** Active			
Z - MECH Courses - MECH 322 - Computer Applic 2 for MET - Relate their education to problems in industry - Student will be able to relate their education to problems in industry **Outcome Status:** Active			
Z - MECH Courses - MECH 330 - Heat Transfer - Basic Heat Transfer - Student will be able to use basic heat transfer equations for conduction, convection, radiation.		12/03/2009 - xxxxxxxxx **Classification:** Inconclusive	

Course Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
80% Success Rate Expected. **Start Date:** 08/29/2005 **Outcome Status:** Active		**Action:** 1 - No Action Required 10/14/2009 - Student Evaluation. Fall -2004 - 76.3% Fall 2005 - 85.5% Fall 2006 - 77.3% Fall 2007 - 86.5% Fall 2008 - 60.7% Instructor Evaluation Spring 05 - 88.6 **Classification:** Inconclusive **Action:** 2 - Pending Action **Related Documents:** MECH 330 Assessment Form MECH 330	
Z - MECH Courses - MECH 330 - Heat Transfer - Steady State & Transient Conduction - Student will be able to solve steady-state and transient conduction problems. 80% Success Rate Expected. **Start Date:** 08/29/2005 **Outcome Status:** Active		10/14/2009 - Student Evaluation. Fall 2004 - 63.8% Fall 2005 - 77.6% Fall 2006 - 72.7% Fall 2007 - 78.8% Fall 2008 - 65% **Classification:** Criterion Not Met **Action:** 2 - Pending Action **Related Documents:** MECH 330 Assessment Form MECH 330 MECH 330	
Z - MECH Courses - MECH 330 - Heat Transfer - Empirical Results - Student will be able to apply empirical results to convection problems. 80% Success Rate Expected.		10/14/2009 - Student Evaluation. Fall 2004 - 62.5% Fall 2005 - 77.6% Fall 2006 - 72.7%	

Course Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
Start Date: 08/29/2005 **Outcome Status:** Active		Fall 2007 - 78.8% Fall 2008 - 60.9% **Classification:** Criterion Not Met **Action:** 2 - Pending Action	
Z - MECH Courses - MECH 330 - Heat Transfer - Predict heat exchanger performance - Student will be able to predict heat exchanger performance. 75% Success Rate Expected. **Start Date:** 08/23/2004 **Outcome Status:** Active		10/14/2009 - Student Evaluation. Fall 2004 - 75% Fall 2005 - 77.6% Fall 2006 - 68.2% Fall 2007 - 76.9% Fall 2008 - 60.7% Instructor Evaluation Fall 04 - 71.6% **Classification:** Inconclusive **Action:** 2 - Pending Action	
Z - MECH Courses - MECH 332 - Mech Measurements/Mechatronics - Demonstrate understanding of sensor operation - Student will be able to demonstrate understanding of sensor operation , basic circuits, and operational amplifiers. **Outcome Status:** Active			
Z - MECH Courses - MECH 332 - Mech Measurements/Mechatronics - Function in teams - Student will be able to function in teams to complete weekly lab assignments including reports. **Outcome Status:** Active			
Z - MECH Courses - MECH 332 - Mech Measurements/Mechatronics - construct and calibrate a transduce - Student will be able			

Course Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
to construct and calibrate a transducer or equivalent unique project. **Outcome Status:** Active			
Z - MECH Courses - MECH 332 - Mech Measurements/Mechatronics - Document, present, and evaluate project. - Student will be able to document, present, and evaluate project. **Outcome Status:** Active			
Z - MECH Courses - MECH 340 - Statics-Strength of Materials - Solve concurrent force systems for unknowns - Student will be able to solve concurrent force systems for unknowns 80% Success Rate expected **Outcome Status:** Active		10/14/2009 - Instructor Assessment: Fall 2004 - 72.6%; Fall 2009 - 82% **Classification:** Criterion Not Met **Action:** 2 - Pending Action 10/14/2009 - Student Self-Assessment: Fall 2005 - 85%; Fall 2006 - 86%; Fall 2007 - 83%; Fall 2008 - 78%; Fall 2009 - 78% **Classification:** Inconclusive **Action:** 2 - Pending Action **Related Documents:** MECH 340 Assessment Form MECH 340	
Z - MECH Courses - MECH 340 - Statics-Strength of Materials - Solve non-concurrent force systems for unknowns - Student will be able to solve non-concurrent force systems for unknowns 80% Success Rate expected		10/14/2009 - Instructor Assessment: Fall 2004 - 77.9%; Fall 2009 - 70% **Classification:** Criterion Not Met	

Course Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
Start Date: 08/29/2005 **Outcome Status:** Active		**Action:** 2 - Pending Action	
		10/14/2009 - Student Self-Assessment: Fall 2004 - 76.2%; Fall 2005 - 86.6%; Fall 2006 - 71%; Fall 2007 - 74%; Fall 2008 - 72%; Fall 2009 - 78% **Classification:** Criterion Not Met **Action:** 2 - Pending Action **Related Documents:** MECH 340 Assessment Form MECH 340	10/21/2009 - Need to review problems and books used. Book Change in 2008. Another change may be coming in 2010.
Z - MECH Courses - MECH 340 - Statics-Strength of Materials - Construct V-M diagrams for beams - Student will be able to construct V-M diagrams for beams 80% Success Rate expected **Start Date:** 08/29/2005 **Outcome Status:** Active		10/14/2009 - Instructor Assessment: Fall 2004 - 87%; Fall 2009 - 75% **Classification:** Criterion Met **Action:** 1 - No Action Required **Related Documents:** MECH 340 Assessment Form	
		10/14/2009 - Student Self-Assessment: Fall 2004 - 73%; Fall 2005 - 74%; Fall 2006 - 74%; Fall 2007 - 71%; Fall 2008 - 67%; Fall 2009 - 80% **Classification:** Criterion Not Met **Action:** 2 - Pending Action **Related Documents:** MECH 340 Assessment Form	

Course Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
		MECH 340	
Z - MECH Courses - MECH 340 - Statics-Strength of Materials - Determine stresses associated with axial, bending, shear, etc. - Student will be able to determine stresses associated with axial, bending, shear, and torsion loads, and combination loadings. 80% Success Rate expected **Start Date:** 08/29/2005 **Outcome Status:** Active		10/14/2009 - Instructor Assessment: Fall 2004 - 74.7%; Fall 2009 - 71% **Classification:** Criterion Not Met **Action:** 2 - Pending Action **Related Documents:** MECH 340 Assessment Form	
		10/14/2009 - Student Self-Assessment: Fall 2004 - 76.2%; Fall 2005 - 86.6%; Fall 2006 - 71%; Fall 2007 - 74%; Fall 2008 - 72%; Fall 2009 - 80% **Classification:** Criterion Not Met **Action:** 2 - Pending Action **Related Documents:** MECH 340 Assessment Form MECH 340	
Z - MECH Courses - MECH 341 - Lab For Statics-Strength Matls - Set up, run, and analyze experiments demonstrating the principles of statics - Student will be able to set up, run, and analyze experiments demonstrating the principles of statics 80% Success Rate Expected. **Start Date:** 08/29/2005 **Outcome Status:** Active	**Assessment Method:** Student Survey **Assessment Method Category:** Survey - Students **Criterion for Success:** 80% Success Rate **Related Documents:** MECH 341 Assessment Form		
	Assessment Method: Lab Experiments **Assessment Method Category:** Z - Other - specify	05/11/2010 - Instructor Assessment: Fall 2004 - 89.3%; Fall 2009 - 82%	

Course Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
	Criterion for Success: 80% success rate expected	**Classification:** Criterion Met **Action:** 1 - No Action Required	
		10/14/2009 - Student Self-Assessment: Fall 2004 - 86.4%; Fall 2008 - 87%; Fall 2009 - 81% **Classification:** Criterion Met **Action:** 1 - No Action Required **Related Documents:** MECH 341 MECH 341	
Z - MECH Courses - MECH 341 - Lab For Statics-Strength Matls - Teamwork - Student will be able to in a small team, design a simple structure ? demonstrating comprehension of statics and strengths of materials 80% Success Rate Expected **Start Date:** 08/29/2005 **Outcome Status:** Active		10/14/2009 - Student Evaluation: Fall 2004 - 86.4%; Fall 2008 - 93%; Fall 2009 - 81%; Instructor Assessment: Fall 2004 - 96.5%; Fall 2009 - 76% **Classification:** Criterion Met **Action:** 1 - No Action Required **Related Documents:** MECH 341 MECH 341	
Z - MECH Courses - MECH 360 - Dynamics - Demonstrate ability to use calculus to solve particle kinematics problems - Student will be able to demonstrate ability to use calculus to solve particle kinematics problems Success Rate 80% expected.		10/15/2009 - Instructor Rating Spring 05 - 84.5% **Classification:** Criterion Met **Action:** 1 - No Action Required	

Course Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
Start Date: 08/29/2005 **Outcome Status:** Active		**Related Documents:** MECH 360 10/15/2009 - Student Self assessment Spring 05 - 72.9% Spring 07 - 76% Spring 08 - 91% Spring 09 - 90% **Classification:** Criterion Met **Action:** 1 - No Action Required **Related Documents:** MECH 360 MECh 360 MECH 360 MECH 360	
Z - MECH Courses - MECH 360 - Dynamics - Solve 3-4 particle dynamics problems - Student will be able to Solve 3-4 particle dynamics problems. Success Rate 80% expected. **Start Date:** 08/30/2004 **End Date:** 05/06/2005 **Outcome Status:** No Longer an Outcome		10/15/2009 - Instructor Evaluation Spring 05 - 79.4% Student Evaluation Spring 05 - 67.1% **Classification:** Inconclusive **Action:** 1 - No Action Required **Curriculum Change:** Does Not Require UCC Approval	08/29/2005 - Changed Instructor 2006 **Follow-Up:** 05/05/2006 - No follow-up required.
Z - MECH Courses - MECH 360 - Dynamics - Apply principles of work and energy, impulse and momentum, and impact - Student will be able to apply principles of work and energy, impulse and momentum, and impact. Success Rate 80% expected. **Start Date:** 08/23/2004 **Outcome Status:** Active		10/15/2009 - Instructor Evaluation Spring 05 - 79.7% Student Self Evaluations Spring 05 - 77.4% Spring 07 - 86% Spring 08 - 97% Spring 09 - 100% **Classification:**	

Course Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
		Criterion Met **Action:** 1 - No Action Required **Related Documents:** MECH 360 MECH 360	
Z - MECH Courses - MECH 360 - Dynamics - Solve 2-D rigid body kinetics problems - Student will be able to solve 2-D rigid body kinetics problems. Success Rate 80% expected. **Start Date:** 08/23/2004 **Outcome Status:** Active		10/15/2009 - Student Evaluations Spring 05 - 61.4% Spring 07 - 82% Spring 08 - 98% Spring 09 - 94% **Classification:** Criterion Met **Action:** 1 - No Action Required	
Z - MECH Courses - MECH 360 - Dynamics - Linear & Angullar Velocity - Student will be able to understand linear and angular displacements, velocities and accelerations. 80% Success Results expected. **Start Date:** 08/22/2005 **Outcome Status:** Active		10/15/2009 - Student Self Evaluations Spring 07 - 86% Spring 08 - 98% Spring 09 - 99% **Classification:** Criterion Met **Action:** 1 - No Action Required **Related Documents:** MECH 360 Assessment Form MECh 360 MECH 360 MECH 360	
Z - MECH Courses - MECH 393 - Industrial Internship - Technical Growth - The student will demonstrate technical growth during the internship. 85% Success Rate Expected. **Start Date:** 05/10/2004		10/14/2009 - Employer Survey Employer Survey 2003 - 86% 2004 - 85.7% 2006 - 95.8% 2009 - 86.7%	

Course Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
Outcome Status: Active		Student Evaluation 2004 - 90% **Classification:** Criterion Met **Action:** 1 - No Action Required **Related Documents:** MECH 393	
Z - MECH Courses - MECH 393 - Industrial Internship - Productivity - The student will demonstrate increased productivity during internship. 85% Success Rate Expected. **Start Date:** 05/10/2004 **Outcome Status:** Active		10/14/2009 - Employer Survey 2004 - 85.7% Student Evaluation 2004 - 90% **Classification:** Criterion Met **Action:** 1 - No Action Required	
Z - MECH Courses - MECH 393 - Industrial Internship - Expectations - The student will meet the employers expectations for an intern. 85% Success Rate Expected. **Start Date:** 05/10/2004 **Outcome Status:** Active		10/14/2009 - Employer Survey 2004 - 88.6% Student Evaluation 2004 - 80% **Classification:** Criterion Met **Action:** 1 - No Action Required	
Z - MECH Courses - MECH 393 - Industrial Internship - Knowledge relative to tasks - The student will demonstrate Knowledge and performance relative to tasks. 85% Success Rate Expected. **Start Date:** 05/10/2004 **Outcome Status:** Active		10/14/2009 - Employer Survey 2004 - 85.7% Student Evaluation 2004 - 90% **Classification:** Criterion Met **Action:** 1 - No Action Required	
Z - MECH Courses - MECH 421 - MET Senior Lab - Demonstrate understanding of sensor, signal conditioning, and statistics	**Assessment Method:** Survey of students on completion of course **Assessment Method Category:**	10/07/2009 - Student Surveys Fall 2004 - 71.9% Fall 2005 - 78.3%	

Course Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
Student will be able to demonstrate understanding of sensor, signal conditioning, and statistics basics 75% Expected Success Rate. **Start Date:** 08/23/2004 **Outcome Status:** Active	Survey - Students **Criterion for Success:** 75% success rate	Fall 2006 - 76.4% - CD Fall 2007 - 75.0% Fall 2008 - Fall 2009 - **Classification:** Criterion Met **Action:** 1 - No Action Required **Related Documents:** MECH 421 Assessment data MECH 421 Assessment Form	
		10/15/2009 - Instructor Rating Fall 05 - 94.8% **Classification:** Criterion Met **Action:** 1 - No Action Required **Related Documents:** MECH 421 Assessment Form	
Z - MECH Courses - MECH 421 - MET Senior Lab - Use Fourier transforms to analyze time-domain data - Student will be able to use Fourier transforms to analyze time-domain data. 75% Expected Success Rate. **Start Date:** 08/23/2004 **Outcome Status:** Active	**Assessment Method:** Survey of students upon completion of course **Assessment Method Category:** Survey - Students **Criterion for Success:** 75% success rate	10/07/2009 - Student Surveys Fall 2004 - 60.0% Fall 2005 - 76.7% Fall 2006 - 65.3% Fall 2007 - 64.6% **Classification:** Criterion Not Met **Action:** 2 - Pending Action **Related Documents:** MECH 421 Assessment data MECH 421 Assessment Form	10/07/2009 - Committee of Math and technology instructors and interested parties has been created as of 10/2/09 to address issues of students not being prepared by math courses to perform work in engineering technology courses, including MECH 421. Objective of committee is to review all math courses and determine what can be to change, enhance, or modify/add teaching methods to change the pedagogy of teaching math to engineering students
		10/15/2009 - Instructor Rating Fall 05 - 68%	

Course Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
		Classification: Criterion Not Met **Action:** 1 - No Action Required	
Z - MECH Courses - MECH 421 - MET Senior Lab - Write programs with LabView for data acquisition and analysis - Student will be able to write programs with LabView for data acquisition and analysis. 75% Expected Success Rate. **Start Date:** 08/23/2004 **Outcome Status:** Active	**Assessment Method:** Survey students upon completion of course **Assessment Method Category:** Survey - Students **Criterion for Success:** 75% success rate	10/07/2009 - Student survey Fall 2004 - 68.3% Fall 2005 - 75.0% Fall 2006 - 61.8% Fall 2007 - 75.0% **Classification:** Criterion Met **Action:** 1 - No Action Required **Related Documents:** MECH 421 Assessment data MECH 421 Assessment Form	10/07/2009 - MECH 322 has been added to program to increase students exposure to LabView. It is expected that this should help students in their knowledge and use of Labview.
		10/15/2009 - Instructor Rating Fall 05 - 93.5% **Classification:** Criterion Met **Action:** 1 - No Action Required	
Z - MECH Courses - MECH 421 - MET Senior Lab - Complete a team project involving programming, data acquisition, analysis, report - Student will be able to complete a team project involving programming, data acquisition, analysis, report. **Start Date:** 08/23/2004 **Outcome Status:** Active	**Assessment Method:** Survey of students upon completion of course **Assessment Method Category:** Survey - Students **Criterion for Success:** 75% success rate	10/07/2009 - Student Survey Fall 2004 - 73.3% Fall 2005 - 86.7% Fall 2006 - 80.6% Fall 2007 - 83.3% **Classification:** Criterion Met **Action:** 1 - No Action Required **Related Documents:** MECH 421 Assessment data MECH 421 Assessment Form	

Course Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
		10/15/2009 - Instructor Rating Fall 05 - 89.5% **Classification:** Criterion Met **Action:** 1 - No Action Required	
Z - MECH Courses - MECH 421 - MET Senior Lab - Ethics - Student will develop an understanding of ethics **Start Date:** 08/23/2004 **Outcome Status:** Active			
Z - MECH Courses - MECH 440 - Noise and Vibrations - Demonstrate understanding of forced/unforced SDOF/MDOF vibratory systems. - Student will be able to demonstrate understanding of forced/unforced SDOF/MDOF vibratory systems. **Outcome Status:** Active	**Assessment Method:** Problems/Homework/test **Assessment Method Category:** Case Studies/Problem-based Assignments **Criterion for Success:** 75% Success Rate		
Z - MECH Courses - MECH 440 - Noise and Vibrations - Demonstrate understanding of dampening effects on vibration - Student will be able to demonstrate understanding of dampening effects on vibration **Outcome Status:** Active			
Z - MECH Courses - MECH 440 - Noise and Vibrations - Demonstrate understanding of wave motion and other characteristics of sound propagation - Student will be able to demonstrate understanding of wave motion and other characteristics of sound propagation **Outcome Status:** Active			

Course Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
Z - MECH Courses - MECH 440 - Noise and Vibrations - Use a sound meter to measure and evaluate typical environmental noise sources - Student will be able to use a sound meter to measure and evaluate typical environmental noise sources **Outcome Status:** Active			
Z - MECH Courses - MECH 499 - MET Senior Project - Write a proposal for a capstone project. - Student will be able to write a proposal for a capstone project that uses material from coursework throughout the curriculum 80% Success Rate Expected. **Start Date:** 08/23/2004 **Outcome Status:** Active		10/15/2009 - Instructor Rating Spring 05 - 89.3% **Classification:** Criterion Met **Action:** 1 - No Action Required 10/07/2009 - Student Self Evaluations Spring 2005 - 72.9% Spring 2006 - 76.4% Spring 2007 - 75.0% Spring 2008 - 83.3% Spring 2009 - 83.3% **Classification:** Criterion Met **Action:** 1 - No Action Required **Related Documents:** MECH 499 Assessment Form MECH 499 Assessment Data	
Z - MECH Courses - MECH 499 - MET Senior Project - Complete a capstone project. - Student will be able to complete a capstone project that demonstrates problem solving, testing, design, and analysis. 80% Success Rate Expected. **Start Date:** 08/23/2004 **Outcome Status:** Active	**Assessment Method:** Student Survey upon completion of course **Assessment Method Category:** Survey - Students **Criterion for Success:** 80% Success Rate	10/15/2009 - Instructor Rating Spring 05 - 79.4% Spring 06 - 81.6% Spring 07 - 78.8% Spring 08 - 84.9%	

Course Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
		Spring 09 - 85.5% **Classification:** Criterion Met **Action:** 1 - No Action Required	
		10/07/2009 - Student Self Survey Spring 2005 - 79.2% Spring 2006 - 88.9% Spring 2007 - 80.6% Spring 2008 - 86.1% Spring 2009 - 85.9% **Classification:** Criterion Met **Action:** 1 - No Action Required	
Z - MECH Courses - MECH 499 - MET Senior Project - Make a formal project presentation - Student will be able to make a formal project presentation with the use of various media. 80% Success Rate Expected. **Start Date:** 08/23/2004 **Outcome Status:** Active		10/15/2009 - Instructor Rating Spring 05 - 78.6% Advisory Board Spring 05 - 85% Other Faculty Spring 05 - 68% **Classification:** Criterion Met **Action:** 1 - No Action Required	
Z - MECH Courses - MECH 499 - MET Senior Project - Write a comprehensive project report - Student will be able to write a comprehensive project report. 80% Success Rate Expected. **Start Date:** 08/23/2004	**Assessment Method:** Student Self survey **Assessment Method Category:** Survey - Students **Criterion for Success:** 75% success rate		
Outcome Status: Active		10/15/2009 - Instructor Rating Spring 05 - 79.4% **Classification:** Inconclusive **Action:** 1 - No Action Required	

Course Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
Z - MECH Courses - MECH 499 - MET Senior Project - Modern Tools - Student will be able to applied the modern tools of the discipline. 80% Success Rate Expected. **Start Date:** 08/23/2004 **Outcome Status:** Active			

Unit Assessment Report

Ferris State University

Program - Mechanical Engineering Technology (B.S.)

Mission Statement: The Mechanical Engineering Technology program seeks to provide a stimulating learning environment to prepare students for the broad array of technical careers associated with the discipline.

Advisory Board/Committee Meetings: Once per year

Next FSU Academic Program Review: 2010-2011

Accreditation Body: Technology Accreditation Commission - Accreditation Board for Engineering & Technology (TAC-ABET)

Academic Year of Next Accreditation Review: 2010-2011

College: CET

Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
Program - Mechanical Engineering Technology (B.S.) - Problem Solving - Student will be able to apply engineering principles to complex technical problems **Outcome Types:** Learning **Start Date:** 01/12/2009 **End Date:** 05/08/2009 **Outcome Status:** Active	**Assessment Method:** Evaluation of students projects by Instructor, other faculty and Advisory Board. **Assessment Method Category:** Case Studies/Problem-based Assignments **Criterion for Success:** Success rate of 80% or better **Related Documents:** MECH 499 Outline	10/07/2009 - Student Self Assessment that they completed a capstone project, which includes solving a complex problem Spring 2005 - 79.2% Spring 2006 - 88.9% Spring 2007 - 80.6% Spring 2008 - 86.1% Spring 2009 - 85.9% **Classification:** Criterion Met **Action:** 1 - No Action Required **Related Documents:** MECH 499 data 10/07/2009 - Advisory Board Evaluation Spring 2005 - 61.7% Spring 2006 - Spring 2007 65.8 Spring 2008 - 71.1% Spring 2009 - 75.0% **Classification:** Criterion Not Met **Action:** 2 - Pending Action **Related Documents:** MECH 499 data	

Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
		10/07/2009 - Other Faculty Evaluation Spring 2005 - 60.0% Spring 2006 - 57.1 Spring 2007 Spring 2008 - 65.9% Spring 2009 - 73.7% **Classification:** Criterion Not Met **Action:** 1 - No Action Required **Related Documents:** MECH 499 data	
		10/07/2009 - Instructor Evaluation Spring 2005 - 73.2% Spring 2006 - 69.0% Spring 2007 Spring 2008 - 82.1% Spring 2009 - 92.2% **Classification:** Criterion Met **Action:** 1 - No Action Required **Related Documents:** MECH 499 data	
Program - Mechanical Engineering Technology (B.S.) - Capstone Project - Student will be able to carry out a capstone engineering project involing design, testing, analysis, presentation and reporting. **Start Date:** 08/30/2004 **End Date:** 05/07/2010 **Outcome Status:** Active	**Assessment Method:** Evaluation of project by Instructor **Assessment Method Category:** Project/Model/Invention **Criterion for Success:** 80% success rating expected	10/22/2009 - Students Self Evaluation Spring 05 - 79.4% Spring 06 - 81.6% Spring 07 - 78.8% Spring 08 - 84.9% Spring 09 - 85.5% **Classification:** Criterion Met **Action:** 1 - No Action Required	
	Assessment Method: Advisory Board members review projects with students. **Assessment Method Category:**		

Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
	Project/Model/Invention **Criterion for Success:** 80% success rating		
	Assessment Method: Other faculty reviews of project presentations **Assessment Method Category:** Project/Model/Invention **Criterion for Success:** 80% success rate expected.		
Program - Mechanical Engineering Technology (B.S.) - Communication - Students will be able to use a variety of media to communicate effectively with diverse audiences. **Outcome Types:** Learning **Start Date:** 01/12/2009 **End Date:** 05/01/2009 **Outcome Status:** Active	**Assessment Method:** Student will prepare a formal presentation to a diverse audience for evaluation **Assessment Method Category:** Presentation(Oral) **Criterion for Success:** Student will successfully present a report on the problem, methods used, analysis, solution and improvements or revisions recommended using oral and visual media with a 80% achievement of success. **Related Documents:** MECH 499 Outline	05/08/2009 - Assessment by other Faculty Spring 05 - 70.7% Spring 06 - 61.1% Spring 08 - 60.8% Spring 09 - 71.1% **Classification:** Criterion Not Met **Action:** 1 - No Action Required **Related Documents:** MECH 499 data	
		05/08/2009 - Assessment from the Project Report - By the Instructor Spring 05 - 77.1%- Spring 06 - 86.1% " Spring 07 - 83.3% " Spring 08 - 91.7% " Spring 09 - 84.4% " **Classification:** Criterion Met **Action:** 1 - No Action Required **Related Documents:** MECH 499 data	

Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
Program - Mechanical Engineering Technology (B.S.) - Team Work - Student will demonstrate ability to work on teams. **Outcome Types:** Learning **Outcome Status:** Active	**Assessment Method:** Student will be able to recognize the importance of teamwork in problem solving. **Assessment Method Category:** Internship Evaluation **Criterion for Success:** A review rating of 90% or higher		
	Assessment Method: Survey of students upon completion of course **Assessment Method Category:** Survey - Students **Criterion for Success:** 75% success rate	10/07/2009 - Student Survey - Self Assessment Fall 2004 - 73.3% Fall 2005 - 86.7% Fall 2006 - 80.6% Fall 2007 - 83.3% **Classification:** Criterion Met **Action:** 1 - No Action Required **Related Documents:** MECH 421 Assessment MECH 421 Assessment form	
Program - Mechanical Engineering Technology (B.S.) - Modern Tools of discipline - Student will demonstrate the proficiency in modern tools of the discipline. **Outcome Types:** Learning **Start Date:** 08/30/2004 **End Date:** 05/08/2009 **Outcome Status:** Active	**Assessment Method:** Student will be able to categorize the steps of a project and document this in a graphic form. **Assessment Method Category:** Project/Model/Invention **Criterion for Success:** 80% Success Rate **Related Documents:** MECH 499 Outline		
	Assessment Method: Faculty grades **Assessment Method Category:** Survey - Faculty **Criterion for Success:** 80% Success Rate	10/07/2009 - Faculty Grade Spring 2005 - 60.0% Spring 2006 - 63.5% Spring 2007 - 75.6% Spring 2008 - 72.9% Spring 2009 - 81.4% **Classification:**	

Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
		Criterion Met **Action:** 1 - No Action Required **Related Documents:** MECH 499 data MECH 499 data	
Program - Mechanical Engineering Technology (B.S.) - Ethics - Student will demonstrate understanding of ethical issues in the discipline **Outcome Types:** Learning **Outcome Status:** Active	**Assessment Method:** Students will be able to identify ethical issues and appraise their positions on these. **Assessment Method Category:** Test - Internally Developed - Pre/Post or Post **Criterion for Success:** A 80% success rate **Related Documents:** MECH 499 Outline	09/18/2009 - Students Self assessments Spring 05 - 41.4% Spring 06 - 20.0% Spring 07 - 20.0% Spring 08 - 20.0% Spring 09 - 20.0% **Classification:** Criterion Not Met **Action:** 2 - Pending Action **Change Assessment Strategy:** Yes **Professional Development Required:** Yes **Related Documents:** MECH 499 data Ethics Summary	10/22/2009 - Review materials used and method of assessment used to determine what is happening to students understanding of ethics.
Program - Mechanical Engineering Technology (B.S.) - Diversity and globalization - Student will be able to relate issues in diversity and globalization to their discipline. **Outcome Types:** Learning **Start Date:** 08/30/2004 **Outcome Status:** Active	**Assessment Method:** Quiz in MECH 499 **Assessment Method Category:** Test - Internally Developed - Pre/Post or Post **Criterion for Success:** 80% Success Rate Expected **Related Documents:** Globalization Data	10/23/2009 - Quiz Data Spring 2006 - 80% Spring 2007 - 79% Spring 2008 - 95% Spring 2009 - 87% **Classification:** Criterion Met **Action:** 1 - No Action Required **Related Documents:** Globalization Data	

Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
		10/22/2009 - Diversity assessment quiz from Legal Services used. The quiz was more educational in nature than useful as an assessment tool. Questions dealt with detailed knowledge of statistics on various populations. Scores were typically 1-3 out of 10. A copy will be available. Other means of assessment were sought. Spring 09 - 64 **Classification:** Criterion Met **Action:** 2 - Pending Action **Related Documents:** Diversity Diversity Rubric	10/22/2009 - Conclusion: Unless a better means of assessment comes up, continue with this means.Target to be established after several years.
Program - Mechanical Engineering Technology (B.S.) - Continuing Education - Student will understand the need and options to continue life long learning in the engineering field. **Outcome Types:** Learning **Outcome Status:** Active	**Assessment Method:** Students will be evaluated on a graduate survey to determine hteir education after graduation. **Assessment Method Category:** Survey - Alumni (after one year) **Criterion for Success:** Students pursue additional education.		
	Assessment Method: Student will be able to describe the importance of continuing education. **Assessment Method Category:** Test - Internally Developed - Pre/Post or Post **Criterion for Success:** A 90% understanding of the need for continuinmg educatyion.		
Program - Mechanical Engineering			

Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
Technology (B.S.) - Problems in industry - Student will be able to relate their education to problems in industry. **Outcome Types:** Learning **Start Date:** 08/30/2004 **End Date:** 05/07/2010 **Outcome Status:** Active	**Assessment Method:** Employer evaluation **Assessment Method Category:** Internship Evaluation **Criterion for Success:** Rating of 80% or better		

Curriculum Map

TAC/ABET Outcome mapping

Program - Mechanical Engineering Technology (B.S.) - Curriculum Map

Legend: (A) - Program Assessment, (I) - Introduced, (M) - Mastery, (R) - Reinforced

Outcomes	ENGL 311	MATH 226	MATL 240	MATL 341	MECH 311	MECH 322	MECH 330	MECH 332	MECH 360	MECH 393	MECH 421	MECH 440	MECH 499	MFGE 341	MFGE 423	PHYS 212
Problem Solving			A, I	A, R	A, I		A, I	A, I	A		A, I, R	A, I	A, M	A, I	A	I
Capstone Project	M									I	I		M, R			
Communication	I							R					A, M			
Team Work								I		A, R	A, R					
Modern Tools of discipline						I, R		I, R		A, I	A, R		A			
Ethics													A, R			
Diversity and globalization																
Continuing Education										A, I, R			A, I, R			
Problems in industry					I	I		I		A, M	R		A, M, R			

Charles G. Drake, Professor

Program	Mechanical Engineering Technology Program
Degrees	B.S. Mathematics, Lake Superior State College, 1974 M.S. Mechanical Engineering, Michigan Technological University, 1992
Yyears of service	20 years, appointed 9/2/1990, Professor, 2002
Other teaching experience	Graduate Teaching Assistant 1974-1977 Taught engineering graphics and statics Mechanical Engineering- Engineering Mechanics Dept., Michigan Technological University, Houghton, Michigan
Full – time industrial experience	Test Engineer, 1985-1989, Engineering Test Section , Product Development Laboratory, Reynolds Metals Company, Richmond, Virginia Design Engineer, 1977-1985, Engineering Dept., Product Development Laboratory, Reynolds Metals Company, Richmond, Virginia
Professional recognition	Registered Professional Engineer, State of Michigan Commonwealth of Virginia
Principal publications during the last five years	None
Scientific and technical societies member	American Society of Mechanical Engineers, Member American Society of Engineering Educators, Member Fluid Power Society, Member Great Lakes Renewable Energy Assoc. Society of Automotive Engineers American Solar Energy Society, (non-Member) Michigan Society of Professional Engineers, Big Rapids Chapter, Scholarship Chair, 1995- present 20089 Math Counts Coordinator, 2000 to present
Honors and awards	Graduated with High Honors, 1974, Lake Superior State College Alpha Chi Honorary, 1974, Lake Superior State College Pi Tau Sigma, Mechanical Engineering Honorary, 1975

	Michigan Technological University
Specific programs and activities to maintain and enhance professional competence in which participated during the last five years	University General Education Committee, monthly and e-mail discussion, 2001-2009 (<1 hour/week) University Curriculum Committee, weekly and e-mail correspondence, 1999-2008 Department Chair 2000 - 2003 Academic Senate College of Engineering Technology Curriculum Committee, 2007-present) College of Engineering Technology Accreditation Assessment Group, 2006-present Industrial Advisory Board for MET Arrange annual visits, conduct meetings, some contact throughout year, 1998 to present
Institutional and professional service in the last five years.	University Curriculum Committee (4 hours/week), Continue as advisor to META student club. Annual overnight trips including GM Proving Grounds, National Auto Show, Design Engineering Show; homecoming float; "Spaghetti Bridge" competition; Adopt-A-Highway. Formula SAE Car Team Advisor 2006 - present
Professional development activities in the last 5 years.	ASEE Regional Conference, Kalamazoo, MI April 2004 TAC/ABET Visiting Team Member Observer 2004 Program Evaluator 2005, 2006, 2007 ABET Faculty Workshop For Continuous Program Improvement, Salt Lake City, UT June 2004 ASEE Annual Conference and Exposition Salt Lake City, UT June 2004, Chicago, Ill. 2006 LabVIEW™ 7 BASICS I and II Livonia, MI June 2005 May 2005

	TAC/ABET Program Evaluator training Chicago, IL June 2006 SAE World Congress & Expo. , Detroit, MI 2005 – 2009.
Percentage of time available for research, scholarly activities, or professional development	**0.0%**
% of time commitment to the program	**100%**

Program	Mechanical Engineering Technology Program Energy System Engineering program
Date hired or assigned to department/section/program	January, 1998, Assistant Professor, Mechanical Engineering Technology
Number of years of service to department/ section/program	12 years
Present academic rank and date obtained	Associate Professor, January 2006
Degrees	B.S. Automotive Engineering Technology, Western Michigan University, Kalamazoo, Michigan, 1968 M.S. Mechanical Engineering Technology, Western Michigan University, Kalamazoo, Michigan, 1971
Other teaching experience	Western Michigan University, 1971-72, Adjunct Professor Western Michigan University, Fall 1989, Adjunct Professor
Full – time industrial experience	Hollen Associates, Inc., Grand Rapids & Lansing, 1996 to 1997, President, Operating Commercial & Industrial rebate program for Consumers Energy ANCO Engineers, Inc., Okemos, Michigan, 1992-96, General Manager - Michigan Division, Operating Commercial/Industrial Rebate Programs for Consumers Energy. Hollen Associates, Grand Rapids, Michigan, 1987 – 1992, President, Business Engineering Consultant for various companies. Research & Technology Institute of West Michigan, Grand Rapids, Michigan, 1990-1991. Program Manager, Manufacturing Systems BDO Seidman - CPA, Grand Rapids, Michigan, 1978 – 1987, Senior Manager, Engineering Business Services Federal Mogul Corporation, St. Johns, Michigan, 1976 -1978, Facility Engineer

	Belden Corporation, Automotive Division, Geneva, Illinois, 1972 – 1974, Product Development Engineer
Consulting work	Hollen Associates, as shown above. Consumers Energy Co., 1997 – 2000, Energy Consultant on open contact as needed.
Professional recognition	Registered Professional Engineer, Michigan, 1977
Principal publications during the last five years	None.
Scientific and technical societies of which a member	American Society of Mechanical Engineers, member American Society for Engineering Education
Honors and awards	None
Institutional and professional service in the last five years.	Interim Director – School of Engineering & Technology 2009 – 8/2010. Program Coordinator _ Mechanical Engineering Technology, Program Coordinator - Energy Systems Engineering 2009 –present. Chairman, Mechanical Design Depart. Aug. 2008 – 2009 Chairman of committee to develop Energy Systems Engineering Degree. Traveled to Ibadan, Nigeria, July 2010 to arrange for students of Ibadan Polytechnic to attend Ferris. Faculty Senate Professional Development Committee Advisor to Rube Goldberg Machine Team 2003 to Present. Team won National Championship 2007. Traveled with Team to Tokyo, Japan, January 2010 to set new Guinness World Record. Alternate Advisor for Mechanical Engineering Technology Association (META) and American Society for Mechanical Engineers

Professional development activities in the last 5 years	Banner Training – 10/2008 Chairs Council professional development programs, 2008-09 Safety Awareness Presentation 10/2008 Department Heads/Chairs Professional Development Workshops STEM Student presentation 10/2008 Michigan Energy Future 3/2010 Grant writing workshop – 2009 -2010 Ferris Energy Conf. 4/2009, Speaker 4/2010 MARC 2009 conference
Percentage of time available for research, scholarly activities, or professional development	0.0%
% of time commitment to the program	25% to MET programs 25% to Energy Systems Engineering

Program	Mechanical Engineering Technology Program
Date hired or assigned to department/section/program	August 1998
Number of years of service to department/ section/program	12 years
Present academic rank and date obtained	Associate Professor, August 2004
Degrees	B.S. Mechanical Engineering, Michigan Technological University, 1974 M.S. Mechanical Engineering Michigan Technological University 1981 Penn State, Ph.D. study in Graduate Program in Acoustics (1980-84)
Other teaching experience	Graduate Teaching Assistant: Michigan Technological University (1973-1977) Pennsylvania State University (1980-1984)
Full – time industrial experience	John Deere Company, Waterloo, IA (1977-1979) Noise, Vibration, Stress Analysis of Agricultural Tractors IBM, Endicott, NY (1984-1990) Noise, Vibration, Heat Transfer of mainframe computers Caddtech, Rochester, NY (1997-1998) Sales, Technical Service of CAD (Solid Edge), CAM (Esprit) software
Scientific and technical societies of which a member	American Society of Mechanical Engineers, Member American Society for Engineering Education, Member Acoustical Society of America, Member
Honors and awards	Phi Kappa Phi (National Honor Fraternity) while at

	Penn State
Professional development activities in the last 5 years	FerrisConnect Training Summer 2009
Other duties performed for regular base salary during academic year, with	FSU Professional Development Committee Chair: 1999-2002 FSU Academic Program Review Council (APRC) 2000-2008 Academic Senate, Fall 2002 to Spring 2004 College of Engineering Technology Graduate Program Committee 2002-present College of Technology Scholarship Committee 2003-present Mechanical Design Department Chair 2003-2005 Student Disciplinary Council 2008-present College Diversity Committee 2008-present Advising and tutoring students (4 hours/week)
Other pertinent information related to teaching effectiveness, professional activities, or service to the engineering technology unit.	Graduate courses: ME 561-Finite Element Theory (3 credits) ME 661-Advanced Finite Element Theory (3 credits) ME 665-Sound and Structural Interaction (3 credits) Western Michigan University
Percentage of time available for research, scholarly activities, or professional development	Author (class notes/info in lieu of purchased texts; possible published texts in future): MECH 311 Finite Element Analysis MECH 440 Noise and Vibration Co-Author (class notes/info in lieu of purchased texts; possible published text in future): MECH 340 Statics and Strength of Materials Peer Paper Reviewer for: Advances in Acoustics and Vibration (AAV) American Society of Engineering Education (ASEE) Text Reviewer: Tongue and Sheppard “Dynamics” Wiley 2005 Attendance/participation in numerous Webcasts

	Organizer of College of Engineering Technology Seminar Series Co-Advisor to ASME Human-Powered Vehicle Team 2008-present
% of time commitment to the program	100%

Program	Mechanical Engineering Technology Program
Date hired or assigned to department/section/program	August 2006
Number of years of service to department/ section/program	4 years
Present academic rank and date obtained	Assistant Professor, August 2006
Degrees	Master of Science, Mechanical Engineering, University of Illinois, Urbana, Illinois, December 1991 Bachelor of Science, Mechanical Engineering, GMI (Kettering University), Flint, Michigan, May 1990, Graduated Magna Cum Laude with a 94.5% GPA
Other teaching experience	September 1990 - December 1991, University of Illinois, Urbana, Illinois, Research Assistant
Full – time industrial experience	April 1997 – April 2006,Merritech, Saginaw, Michigan Project Manager / Proposal Engineer January 1992 - March 1997, Delphi Chassis Systems Saginaw, Michigan Manufacturing Engineer / Senior Manufacturing Engineer June 1985 - August 1990,Delphi Chassis Systems, Saginaw, Michigan, Engineering Co-op / Associate Manufacturing Engineer
Consulting work	None
Professional recognition	None
Principal publications during the last five years	None

Scientific and technical societies of which a member	American Society of Mechanical Engineering American Society of Engineering Educators
Honors and awards	None
Specific programs and activities to maintain and enhance professional competence in which participated during the last five years	FCTL; Learner Centered Teaching, May 2007 FCTL; 50 Ways to Assess Student Learning, May 2007 FerrisConnect Training, May 2008 Library, Historical, and Archive Committee, Fall 2008 - present Library Dean Search Committee, Spring 2009 Academic advising Freshman registration College of Engineering Technology welcome back picnic Advisor to student ASME chapter (2008-9) Co-advisor to Ferris' ASME Human Powered Vehicle Challenge team (2008-9)
Percentage of time available for research, scholarly activities, or professional development	0.0%
% of time commitment to the program	100%**.**

Program Audit Form (PAF - Form T11)

Institution: Ferris State University

Program Evaluator: Joe Fuehne Visit dates: Oct. 25 – 27, 2009

These preliminary findings apply to: Mechanical Engineering Technology X Associate Baccalaureate

These findings are subject to review and change for accuracy and consistency by the Technology Accreditation Commission.

General Review Visit Findings

Duplicate this page as needed to summarize results of a General Review only.

Finding # 1 ☐Deficiency ☒Weakness ☐Concern ☐Observation

Criteria: 2b – Program Educational Objectives – a documented process by which the program educational objectives are determined and periodically evaluated based on the needs of the constituencies served by the program

Evidence:

The Industrial Advisory Board, representatives of a major constituency of the program, was not consulted in establishing PEOs and does not periodically review the PEOs for relevancy.

Impact:

The Industrial Advisory Board has not been consulted to establish PEOs or periodically review them, hindering the portential growth of the program.

Expected action:

The program is expected to have the Industrial Advisory Board review the PEOs at their annual meeting.

Program Audit Form (PAF - Form T11)

Institution: Ferris State University

Program Evaluator: Joe Fuehne Visit dates: Oct. 25 – 27, 2009

These preliminary findings apply to: Mechanical Engineering Technology X Associate Baccalaureate

These findings are subject to review and change for accuracy and consistency by the Technology Accreditation Commission.

General Review Visit Findings

Duplicate this page as needed to summarize results of a General Review only.

Finding # 2 ☐Deficiency ☐Weakness ☒Concern ☐Observation

Criteria: 4 – Continuous Improvement – Performance - Evaluate the measurements, assessment, and improvement processes for the program.

Evidence:

All essential elements for a rigorous assessment plan of program outcomes are in place. However, current program outcome assessments rely on student evaluations which are indirect assessments. More direct assessment of program outcomes is needed. Effective outcomes assessment includes the participation of the entire faculty, particularly in small departments such as MET.

Impact:

A large majority of assessment activity has been done by only a few faculty, producing faculty who are unaware of assessment and faculty who are overloaded doing most of the work. Student evaluations are the most common assessment tool but these evaluations represent only indirect measures of learning.

Expected action:

Surveys of graduates 2-3 years after graduation and of employers of MET graduates need to be added to assess program educational objectives. Assessment should be the responsibility of the entire faculty. More direct measures of learning need to be implemented.

Program Audit Form (PAF - Form T11)

Institution: Ferris State University

Program Evaluator: Joe Fuehne Visit dates: Oct. 25 – 27, 2009

These preliminary findings apply to: Mechanical Engineering Technology X Associate Baccalaureate

These findings are subject to review and change for accuracy and consistency by the Technology Accreditation Commission.

General Review Visit Findings

Duplicate this page as needed to summarize results of a General Review only.

Finding # 3 ☐Deficiency ☒Weakness ☐Concern ☐Observation

Criteria: 6 – Faculty - Evaluate the extent to which the faculty demonstrates the following characteristics.

Evidence:

Without question, the MET faculty is dedicated to the program and to the students. The students recognize this and praise the faculty for their dedication. However, insufficient faculty and overextended leadership have resulted in teaching and leadership that is less than effective. In addition, the faculty has no time or encouragement for professional development and scholarly activities, including publishing papers for journals or conferences. This type of scholarly activity is valuable for not only keeping current on technical issues but also learning effective teaching methods.

Impact:

Currently, the faculty is overworked and overextended. The continuous improvement activities are not evenly distributed among the faculty. Extracurricular activities, despite their value, do require much of the faculty's resources. Current leadership has too many responsibilities to provide effective leadership. Professional development activities and scholarly activities, including content or pedagogical research, may be rewarding activities for some of the faculty and would provide enhanced learning opportunities for the students.

Expected action:

Hiring additional faculty would begin to reduce the stress among faculty and allow time for other rewarding activities. Each faculty member should have a professional development plan and be given the resources to execute the plan. The current MET program coordinator's responsibilities should be reduced to allow for effective leadership.

Program Audit Form (PAF - Form T11)

Institution: Ferris State University

Program Evaluator: Joe Fuehne Visit dates: Oct. 25 – 27, 2009

These preliminary findings apply to: Mechanical Engineering Technology X Associate Baccalaureate

These findings are subject to review and change for accuracy and consistency by the Technology Accreditation Commission.

General Review Visit Findings

Duplicate this page as needed to summarize results of a General Review only.

Finding # 4 ☐Deficiency ☒Weakness ☐Concern ☐Observation

Criteria: 7 – Facilities.

Evidence:
Upgrading the facilities for the MET program is essential for the faculty to effectively deliver the program. This was noted in the previous ABET General Review and by all accounts has been minimally addressed by the institution. The program has been given only a single room since the last evaluation and lab equipment has not been upgraded.

Impact:

The number of classrooms, size of classrooms, and technology available in classrooms is inadequate for the effective delivery of the program and not conducive to learning. Students recognize the more-than-adequate facilities of other programs on campus and believe the institution doesn't value the MET program. That the MET program has begun to experience an increase in enrollment is ample evidence of the relevance of the program and the dedication of the faculty. Similarly, the lab equipment of the MET program is inadequate for the effective delivery of the program. The faculty does an exceptional job of using what's available and building additional lab equipment for the program. This, however, is inadequate for the long term survival of the program. More-than-adequate lab equipment exists on the campus in other programs but not shared.

Expected action:

That the MET program has begun to experience an increase in enrollment is ample evidence of the relevance of the program and the dedication of the faculty. Additional space, new classroom technology, and upgrading the lab equipment are needed to continue the growth and to advance the program. These investments may potentially lead to further increases in enrollment and industrial support.

Program Audit Form (PAF - Form T11)

Institution: Ferris State University

Program Evaluator: Joe Fuehne Visit dates: Oct. 25 – 27, 2009

These preliminary findings apply to: Mechanical Engineering Technology X Associate Baccalaureate

These findings are subject to review and change for accuracy and consistency by the Technology Accreditation Commission.

General Review Visit Findings

Duplicate this page as needed to summarize results of a General Review only.

Finding # 5 ☐Deficiency ☐Weakness ☒Concern ☐Observation

Criteria: 8 – Support

Evidence:

Current faculty is overworked, not motivated to engage in professional development, and have not had a publication in any form since the last General Review. Faculty need to be supported and encouraged by the administration and leadership to engage in these activities. As noted elsewhere, lab facilities and classrooms are inadequate. Past budgets indicate that the MET program is woefully underfunded relative to other programs on campus, which is quite surprising given current MET headcount and growth. The current program coordinator also serves in other leadership roles as well as continuing to teach classes. His leadership effectiveness has been compromised due to the overload of responsibilities. Despite the current enrollment growth, the quality and continuity of the program is threatened without a renewed financial, facility, and equipment commitment from the institution. As new technologies emerge, faculty cannot continue to build lab equipment to sustain the program.

Impact:

Despite the current enrollment growth, the quality and continuity of the program is threatened without a renewed financial, facility, and equipment commitment from the institution. As new technologies emerge, faculty cannot continue to build lab equipment to sustain the program.

Expected action:

The institution must provide proper financial support to continue the growth of the program. Students are aware of the substandard facilities and believe that the program is not valued by the institution. Responsibilities of the program coordinator need to be reduced to allow effective leadership.

Response to ABET Draft Report Dated February 22, 2010

Mechanical Engineering Technology – Associate Degree.

Program Weaknesses

1. Criterion: Criterion 2. Program Educational Objectives states, "Each program must have in place: … B. a documented process by which the program educational objectives are determined and periodically evaluated based on the needs of constituencies served by the program..."

Response:

The program objectives were originally discussed with the Advisory Board members when the program was created in 1999. The advisory board, alumni and graduating students are surveyed on a regular basis. We may have not gone through each objective with the Advisory Board, but will put this on the agenda for the meeting with the board in April 2010 and each succeeding year. Attached, in Appendix A, is the current survey form for the Advisory Board, which will be on the 2010 Agenda.

As shown in Appendix B, Advisory Board minutes, the program is discussed with the board every year and the faculty considers their comments. Graduating students and alumni are surveyed each year, and comments from each are collected. When considering program changes and revisions, their comments and suggestions are taken into account. An example of the Graduate Survey is in Appendix C.

With the TracDat system that was implemented this past year, surveys, board comments, meeting minutes, etc. can be uploaded into the system. They will then be available to all faculty for review and discussion. This should improve communications and

2. Criterion: Criterion 7. Facilities states, "adequate facilities… must be provided for each program in the form of: a suitable classrooms, laboratories and associated equipment necessary to accomplish the program educational objectives in an atmosphere conducive to learning… c. sufficient financial and human resources to acquire, maintain, update, and operate facilities and equipment appropriate to the program."

The Mechanical Engineering technology program has only one laboratory room, and it is used for other purposes besides laboratory instruction. The quantity of space and quality of equipment in laboratories and classrooms for this program are not as up-to-date as laboratory facilities for other engineering technology programs at this institution. As a result, classrooms and laboratories do not appear adequate for the effective delivery of instruction and do not provide environments conducive to learning. The condition of classrooms and laboratories was

previously cited in the 2004 Final Statement from TAC of ABET, there is no indication that facilities or equipment has been improved since that time. The faculty has done an exceptional job of using available equipment and building additional equipment for the program, but such activities place extra time burden on faculty members and

Response:

First, the MET program has three (3) labs, (SWAN 302,303 and 219), and three (3) classrooms, (SWAN 301B, 304 and 105A), which are assigned to the program. Other rooms are used as needed. We are aware that additional equipment and laboratory space is required for the program, but we are also limited by funding from the university, who is facing its own problems with state funding.

During the current year (2009/10), the program received $9,000 in a one-time funding, which was used to purchase test equipment, and is being used in several courses. This increased our abilities in a number of areas. Prof. Chuck Drake also received an exceptional merit grant this year, for data acquisition equipment to help with laboratory projects. Additional equipment will be requested, such as overhead computer projectors and teaching stations for laboratory areas.

The faculty agree that the laboratories need to be cleaned out of old senior projects and unused equipment. Several projects can be combined in a "pegboard" arrangement, where projects are stored in cabinets, then put up when needed. This should help to clean-up the labs and make more room available.

Program Concerns

1. Criterion: Criterion 4. Continuous Improvement states, "The program must use a documented process incorporating relevant data to regularly assess its program educational objectives and program outcomes and to evaluate the extent in which they are being met". Although the essential elements of a rigorous plan have been defined, current assessment of program outcomes relies totally on student evaluations, which are indirect and subjective assessments. There are currently no tools in place for faculty to directly assess the degree to which students are attaining program outcomes.

Response:

The program has a documented system where each outcome or objective is assessed. The university has adopted the "TracDat" system by Nuventive, to record, and track all programs and course assessments at Ferris. All programs and course objectives are loaded in the system, along with course outlines, collected data for courses and other pertinent information. Many courses only have data from the student portion of the assessment, because faculty have not supplied or entered their evaluations of the program or course assessments.

In November 2009, all faculties, in all programs, in the College of Engineering Technology, were given direct access to their courses; giving them responsibility to record data for each course, they teach. Where multiple instructors teach a course, one faculty was assigned responsibility to collect and enter data for that course. The system allows an automatic email to be sent at a certain date, to remind instructors to collect and enter their data. The program coordinator will make sure faculty are notified of their responsibility and double check on their progress. An example of one of several reports available, is shown in Appendix D.

2. Criterion: Criterion 8. Support states. "…Institutional support must include: a. adequate financial resources and constructive leadership to assure the quality and continuity of the program, b. resources sufficient to attract, retain and provide for continued professional development of a well-qualified faculty." Criterion 6. Faculty states, "…The program must have an effective professional development plan for its faculty. The number of faculty members must be sufficient to provide program continuity, proper frequency of course offerings, appropriate levels of student-faculty interaction, and effective student advising and counseling.

The current faculty members have not participated in any recent professional development, and budget histories appear to indicate that the Mechanical Engineering Technology program is funded at a lower level than comparable programs on campus, despite the program's current enrollment growth. …This finding remains a Concern until the program demonstrates (1) that it is being provided adequate financial resources and constructive leadership to assure the quality and continuity of the program, (2) that it is being provided resources sufficient to attract, retain and provide for the continued professional development of a well-qualified faculty, (3) that it has a effective professional development plan for its faculty, and (4) that it has an adequate number of faculty members to provide program continuity, proper frequency of course offerings, appropriate levels of student-faculty interaction, and effective student advising and counseling".

Response:

1. Financial resources have increased over the years for the program. The S&E funding from the College was at the level of $9,936 for several years, through 2008. For 2009 and 2010, this has been increased to $15,917.

2. Funding of professional development is provided through the Dean's Office for various projects submitted by faculty. Funding is also available through the Faculty Senate Professional Development Committee, after acceptance of an appropriate proposal. Equipment for faculty development can be obtained through the Ferris Foundation, Exceptional Merit Grant program, up to $7,000. Travel to conferences, etc. is provided to faculty by the Timme Fund.

The MET faculty has received three grants in recent years. Currently, the faculty has submitted several projects, which are being reviewed by granting groups on campus. Faculty must take the initiative and advantage of these programs.

3. Quality and continuity of the program is also the responsibility of the faculty. All faculty, whether tenure track or post-tenure, must develop a professional development plan that is reviewed at the appropriate level.

4. The program may require additional faculty in the next year or so. This is due in part to the reorganization of the College. The reorganization, currently, places a burden on the MET faculty, as one faculty member is now interim director of the school, and has taught only one class this year. Another faculty member is being given one-quarter release time for program coordination, as the reorganization continues. Aspects of the reorganization should be able to address this issue in the near future.

The frequency of course offerings have been considered and were implemented for a service course this past fall (MECH 250). MECH 340 – Statics and Strength of Materials are offered both in the fall and spring semesters. Other courses are being considered for offerings both semesters.

The MET faculty has been instrumental in developing SAE Formula Team, ASME Human Powered Vehicle Team, Rube Goldberg Competition Team and advisors to the Mechanical Engineering Technology Student Association and ASME Student Chapter. All of which provide considerable interaction between faculty and students, outside the classroom.

Student advising in the College of Engineering Technology is one of the highest rated systems in the university. All faculties must go through advising training. All students have a hold placed on their records for both fall and winter semesters. The student must meet with their advisor to have the hold removed. Starting with the freshman class, fall 2010, students will be entered in the, “Degree Works”, database system. This will provide both the advisor and the student with several views of the student’s transcript and educational records. It is expected to assist advisors in reviewing courses taken and degree requirements. It will also assist transfer students by reviewing the courses accepted by Ferris from other colleges and universities. Training of the faculty will be held during orientation week in August.

Observation for Improvement

1. Assessment, evaluation and improvement activities are not well distributed among faculty members of this program. Program assessment has been conducted by a relatively few faculty members, resulting in some faculty who are unaware of assessment activities and others who carry the burden of assessment and evaluation work.

Response:

This is very true. All faculty members have been reminded to collect and provide assessment data from their courses since the Continuous Improvement Plan was developed in 2005. Some faculty have not responded. Faculty was requested to provide data when the TracDat system was implemented during the fall of 2008 and again the spring of 2009. Data was not received until October 2009 from some faculty. Steps will be taken to correct this in the future. All faculties now have access to TracDat and the assessment reports 24/7. They must be responsible for their part, in a very important component of teaching.

Mechanical Engineering Technology – Baccalaureate Degree.

The Program Weaknesses, Concerns and Observation for Improvement for the Baccalaureate Degree, are the same as those expressed for the Associates Degree. Therefore, we refer the reader to the comments and responses discussed above for the Associates Degree.

Appendix A, Advisory Board Survey

Industrial Advisory Board Survey for Academic Program Review
Ferris State University Mechanical Engineering Technology

Premise	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. The MET Program provides education and training essential to many industries, both in and out of the State of Michigan.					
2. The Program provides graduates with skills useful to your company.					
3. The Program curriculum is appropriate for current industry needs.					
4. The Program curriculum provides an adequate mix of classroom and laboratory-based learning.					
5. Student projects are appropriate as a capstone for a BS in MET and demonstrate sufficient mastery of the curriculum.					
6. Your company would hire a MET program graduate.					
7. Program faculties have sufficient academic credentials.					
8. Program faculties have adequate industrial experience.					
9. Program faculties have adequate extra-curricular involvement with students.					
10. The Program has adequate leadership.					
11. The Program has adequate dedicated laboratory space.					
12. Classrooms used by the Program have adequate instructional technology.					
13. Labs have adequate tools and materials to provide students with a sufficient hands-on learning experience.					
14. The Program has adequate student workspace available for both curricular and extra-curricular student projects.					

15. What do you perceive to be the major strengths of the MET Program?

16. In what area of the MET Program do you see the most need for improvement?

Appendix B, Advisory Board Minutes 2007 -09

MINUTES
Ferris State University
Mechanical Engineering Technology Advisory Board
April 18, 2007

Advisory Board Member Present:

Bob Gilmore	CMS Energy
Calvin Hemmeke	Johnson Controls Incorporated
Ryan Livingston	Borg-Warner Automotive
Matthew Potts	Vortec Tooling Solutions
Dan Sovinski	FSU Physical Plant
Vince Ursini	Behr America

Regrets:

Tom Bush	Fabri-Kal Corporation
Bruno Lehman	Tru Die Cast Corporation
Paul Sims	DJS Systems, Inc
Jay Tepatti	Daimler Chrysler Corporation
Jack VanHeest	Besser Co.

Ferris State University Representatives:

Chuck Drake	Professor, Mechanical Engineering Technology
Brian Brady	Assistant Professor, Mechanical Engineering Technology
Tom Hollen	Associate Professor, Mechanical Engineering Technology
Randy Stein	Associate Professor, Mechanical Engineering Technology
Tom Oldfield	Dean, College of Technology
Ron McKean	Associate Dean, College of Technology
Rich Goosen	Professor, Product Design Engineering Technology and Department Chair, Mechanical Design Dept.

Mechanical Engineering Technology students

Review of Senior Projects
Senior projects for the Class of 2007 were on display in the Dome Room of the Rankin Center. Advisory Board members met with seniors one-on-one to discuss projects. Their impressions become part of the BSMET assessment process.

Board member comments, follow with reference to specific projects have been removed.

Positives included:

- very challenging data acquisition
- very capable student
- well explained, good video, good experimentation
- well defined project
- good communications, articulate
- overall high level
- related theory to experiment
- good job collecting and interpreting data

Concerns/Suggestions included:

- not finished (3)
- poster not outside with apparatus
- exact specifications and results hard to see
- seemed simple – could have added more
- could have been more communicative
- would like to see more complexity (2)
- seemed to be just data collection

Comments from Dean Oldfield
The College is looking for outside sources of funds as state money is going downward. (Spends 4 days /month) on the road. HVAC has a $5M endowment that provided $200k/year, considering developing a "certification and Product Testing Center" – possibly using seniors. The Dean's Office has been a revolving door; programs have survived as their own units. Want to bring CET together as a team. Grow student numbers – 131 seats lost last year possibly due to raised standards. Will start a new budget process. Is interested in becoming a "laptop college."

A PowerPoint™ presentation was given on the current status of the MET programs and initiatives.

Curriculum initiatives include:

- an experimental MET Senior Project course to fit MET Program Outcomes
- eliminating the open computer programming requirement and replacing with a MECH course that is more directed towards MET needs (e.g. MATLAB and math software)
- dropping a combined machine design/FEA course (4 cr) in favor of a MECH FEA/Solid Modeling course (2 cr) to reduce program credits and improve outcomes
- dropping a design for manufacturability course (2 cr) and increasing technical electives from 5 to 6 credits
- reducing Mechanical Measurements from 4 to 3 credits, moving it to the 3rd year following statistics, and moving speech from 3rd to 2nd year.

Faculty Concern:
Randy Stein injected that seniors felt limited on who they could ask for assistance. Chuck Drake indicated that there have never been any restrictions or limits on such.

Engineering vs. Engineering Technology
The board was asked to discuss this issue – where should FSU be? A lively discussion followed.

For

- having both would enhance FSU's image as an engineering school
- ET may limit some career-wise
- make a path available to transition from ET to E

Against

- loss of uniqueness – i.e. make FSU like everyone else
- ET can move up
- stick with and grow MET
- stick with MET and be the best

Board Member Closing Comments:

Matt Potts: MET needs marketing – needs to get enrollment up. Capstone projects need to be done in phases. Formula car, Rube are great! Curriculum – be sure to keep base.

Vince Ursini: Like new room (Swan 219). Students want more lab space and laptops. Create a wishlist of materials and equipment for possible donation from industry. Need to improve resources for labs.

Bob Gilmore: Limited license for LabVIEW™ is a problem for students. Good industry involvement on curriculum, good feedback from students. Use advisory board as a source of resources – guest speakers, materials, equipment.

Cal Hemmeke: Field trips are very good. Social Awareness needs globalization – i.e. "The World is Flat." Computer shortage for data acquisition noted. Engineering economics course is weak.

Ryan Livingston: Expectations on job hunting and projects need to be related to juniors – a wake-up call. Faculty for certain classes need to be more available.

Vince Ursini: Concern: faculty support in several courses. Suggested teacher evaluation by seniors upon graduation. Students felt slighted for taking a welding class as an elective. Behr uses Campbell Scientific rather than LabVIEW™ for data acquisition

Board members were again thanked for their support and service.

The meeting adjourned.

Next Meeting:
Tentatively Friday, April __, 2008. To be announced.

Respectfully submitted,

Chuck Drake

cc: MET Industrial Advisory Board
T. Oldfield, R. McKean, B. Brady, T. Hollen, R. Stein,

MINUTES
Ferris State University
Mechanical Engineering Technology Advisory Board
April 16, 2008

Advisory Board Member Present:

Tom Bush	Fabri-Kal Corporation
Calvin Hemmeke	Johnson Controls Incorporated
Ryan Livingston	Borg-Warner Automotive
Matthew Potts	Vortec Tooling Solutions
Paul Sims	DJS Systems, Inc
Dan Sovinski	FSU Physical Plant
Jay Tepatti	Daimler Chrysler Corporation
Vince Ursini	Behr America
Jack VanHeest	Aromech, Inc.

Regrets:

Bob Gilmore	CMS Energy
Bruno Lehman	Tru Die Cast Corporation

Ferris State University Representatives:

Chuck Drake	Professor, Mechanical Engineering Technology
Brian Brady	Assistant Professor, Mechanical Engineering Technology
Tom Hollen	Associate Professor, Mechanical Engineering Technology
Randy Stein	Associate Professor, Mechanical Engineering Technology
Karen Lerew	Major Gift Officer, College of Engineering Technology
Ron McKean	Associate Dean, College of Technology
Rich Goosen	Professor, Product Design Engineering Technology and Department Chair, Mechanical Design Dept.

Mechanical Engineering Technology students

Review of Senior Projects

Senior projects for the Class of 2008 were on display in the Dome Room of the Rankin Center. Advisory Board members met with seniors one-on-one to discuss projects. There impressions become part of the BSMET assessment process.

Board member comments follow. Reference to specific projects have been removed.

Positives included:

- better communication skills this year – a very important skill
- very well prepared
- broad range of difficulty – some very through, some very light
- liked the multiple individual projects ties the Formula SAE car
- those tied to both Formula and Baja SAE projects are very appropriate
- impressed with building own sensors
- doing fun projects – SAE cars, Human-Powered Vehicle start-up

Concerns/Suggestions included:

- apparently no calculations in one project

Lab Tour Response. Board members were given 3 x 5 cards to take notes.

Swan 302/303
- double doors at ground level would be appropriate
- more vertical clearance, more space
- update testing equipment
- storage area for non-used project equipment
- Swan 302/303 cluttered
- hydraulic and pneumatic trainers look good
- reorganize with open space in middle
- needs better organization to make it attractive to potential students and more professional looking

Swan 219
- very small, low ceiling for a prototype lab
- needs drive-in access for Formula car, etc.
- needs electric drops, filtration, more storage

Comments from meeting with underclassmen:
- more access to machine tools
- access welding equipment
- card swipe access to labs
- make senior project yearlong
- lack of computers; those available are old and slow
- need more space for larger projects
- concern regarding understanding English from some faculty.

The past year was reviewed through a PowerPoint™ presentation.

Associate Dean Ron McKean indicated that state funding for the coming year is uncertain. Tom Crandell is back in the College of Technology to bring in funds through Corporate and Professional Development. COT is developing assessment measures and procedures to encourage meaningful change. The student/lab access issue presents conflicts between risk and accessibility. Support in the form of scholarships is especially needed at this time.

Karen Lerew introduced herself. Her role is cultivate relationships between alumni and industry to gain support for the college.

Rich Goosen indicated that a college level committee is investigating budget allocations among programs. The result should mean an increase for MET. Recruitment letters have gone out.

Curriculum Initiative
MECH 499 MET Senior Project was created as a permanent course following two years as an experimental course. The 3 credit course is design to meet many of the BSMET program's outcomes.

Board Member Closing Comments:

Vince Ursini: Facilities don't look high-tech; attractive facilities are needed to draw in students; would like to see the program grow. NI equipment has been unreliable. Would like lab needs list as Behr is closing labs. Would like more time with students. Seniors are very open. January start for capstone is too late.

Tom Bush: A concern that some projects looked very simple and not done. Projects looked fun.

Dan Sovinski: Put Rube poster where it is visible. Start capstone earlier. More project management supervision. More space is needed – card swipes on doors.

Matt Potts: Would like more time with students – up to 45 minute sessions. Projects are really improved. Use Formula car to recruit. Rube is impressive too. Students need more availability in machine shop. More faculty in projects. Two good programs that need to grow.

Jack VanHeest: Liked student projects. Most were happy to be done. Access to labs an issue for students. Students had team concept.

Ryan Livingston: Time short with students. Less negatives than previous years. Concerns: resources for projects and labs; some instructors difficult to learn from.

Cal Hemmecke: Groups can generate team motivation; observed good team environment. Some resource shortages are OK – normal for the real world. Applied calculus should not be strictly math. Capstones: students felt more faculty involvement would help; include checkpoints.

Jay Tepatti: Students want more access to lab space. Start senior projects in the fall. They want more assistance. All looked professional – important – and not shy.

Paul Sims: Students seemed more positive than last year. Thermo was hardest subject. Seniors looked good – no metal on their faces.

Tom Bush: Well coached. Liked FSU due to practical hands-on approach. Need to advertise more.

Board members were again thanked for their support and service.

The meeting adjourned.

Next Meeting:
Tentatively Friday, April 23, 2009. To be confirmed.

Respectfully submitted,

Chuck Drake

cc: MET Industrial Advisory Board
T. Oldfield, R. McKean, K. Lerew, B. Brady, T. Hollen, R. Stein,

MINUTES
Ferris State University
Mechanical Engineering Technology Advisory Board
April 24, 2009

Advisory Board Member Present:

Tom Bush	Fabri-Kal Corporation
Dave Hubert(for Bob Gilmore)	CMS Energy
Ryan Livingston	Borg-Warner Automotive
Paul Sims	DJS Systems, Inc
Dan Sovinski	FSU Physical Plant
Vince Ursini	Behr America

Regrets:

Calvin Hemmeke	Johnson Controls Incorporated
Matthew Potts	Vortec Tooling Solutions
Jay Tepatti	Daimler Chrysler Corporation
Jack VanHeest	Aromech, Inc.

Ferris State University Representatives:

Chuck Drake	Professor, Mechanical Engineering Technology
Brian Brady	Assistant Professor, Mechanical Engineering Technology
Tom Hollen	Associate Professor, Mechanical Engineering Technology and Department Chair, Mechanical Design Dept.
Karen Lerew	Major Gift Officer, College of Engineering Technology
Tom Oldfield	College of Engineering Technology
Ron McKean	Associate Dean, College of Engineering Technology

Mechanical Engineering Technology students

Regrets:

Randy Stein	Associate Professor, Mechanical Engineering Technology

Review of Senior Projects

Senior projects for the Class of 2009 were on display in the open areas of the Granger Center. Advisory Board members met with seniors individually to discuss projects. Preprinted evaluation sheets for each project were used. These become part of the BSMET program assessment process.

Board member comments follow. Reference to specific projects have been removed.

Positives included:

- very professional (4)
- well presented
- very attentive
- very thorough
- student learned a lot
- good graphics and boards
- all recognized need to do more
- enthusiastic
- good communications
- well spoken

Concerns/Suggestions included:

- some projects seemed simple(2)
- not sure how much work was done by student on one
- need to know and talk to audience
- EEET presentations in background were a distraction – MET needs it's own space
- not complete (2)
- workmanship could be better (1)
- didn't seem to show much interest (1)
- not much presented
- not clear what objective was
- poorly presented, not much on poster

Initial Faculty Response
Faculty concurred with many of the concerns and suggestions. Again, it is noteworthy that grades for projects ranged from A to F. Some fail to complete reports. These are individual projects.

A PowerPoint™ slide show was used to review the past year.

Tom Hollen discussed the draft proposal for a BS in Energy Systems Engineering. The proposal will begin the curriculum process soon. He also indicated the university is moving towards more standardized assessment tracking through a software program called TRACDAT.

Input from Dean's Office
Dr. Oldfield noted that less than 30% of funding now comes from the state. a $1.6 M cut is expected for next year. The College of Engineering Technology (CET) will be cut 2% ofit's funding and three positions. Efficiency needs to be improved including by either increasing enrollments or decreasing faculty. CET has a marketing specialist, is reaching out to veterans, and working with grants.

Ron McKean discussed Ferris State's energy initiatives including the Michigan Energy Conference and Energy Center. He also indicated his strong support for student projects MET students and faculty have been involved with including SAE, Rube Goldberg, and ASME Human Powered Vehicle Competition.

Karen Lerew discussed the College's efforts towards fund-raising.

Board response included considering on-line education, waiving internship requirements for veterans, and considering retraining engineers in hybrid technology.

Feedback from Meeting with Students
Underclassmen expressed concern about graduating on time and the difficulty of obtaining internships. Some expressed preferences for solid modeling software and questioned the need for computer applications courses. Upperclassmen had little to say on internships although the suggestion of having the internship be the capstone or have the project be within the internship. Seniors are very favorable on the education they have received at Ferris State. Observation: they seem to see the need to seek knowledge.

Board Member Closing Comments:

Dan Sovinski: Consider on-line and waiving internship for veterans/experience. Note the the world is becoming "results only", not 8-5 or time on task.

Ryan Livingston: Noted improved comments from students; MET program is improving; excited about energy program; always looking for a little more out of a project; overall students did real well.

Paul Sims: Good feeling about seniors; seemed to be the best prepared to go out the door; spoke well; no blatant errors. There is more learning coming for them.

Tom Bush: Program seems to be working; few complaints; looked prepared for the most part. Enjoyed the casual lunch – suggested arranging for students to sit among board members.

Dave Hubert: Time with students seemed short; very neat program; excited about energy program – a lot of opportunities; recommended more project management.

Vince Ursini: Seniors seemed like a very good group; lack of jobs a concern; need to introduce hybrid mobility a lot going on with hybrid trucks (Bosch, hybrid hydraulics; it's the integrators not OEMs where action is.

Board members were thanked for their support and service.

The meeting adjourned.

Next Meeting:
Tentatively Friday, April 23, 2009. To be confirmed.

Respectfully submitted,

Chuck Drake

cc: MET Industrial Advisory Board
T. Oldfield, R. McKean, K. Lerew, B. Brady, T. Hollen, R. Stein,

Appendix C, Graduate Survey

Recent BS MET grads:

Greetings from Big Rapids!

This survey is part of a new continuous improvement plan for the MET programs at FSU. In brief, we seek to know what has become of our recent graduates in hope of learning how we should be direction the BSMET program. Two significant "early career" outcomes for the BSMET are:

1. find appropriate employment
2. further your education
3. advancement.

This simple survey attempts to measure these three outcomes. Your assistance is appreciated.

By whatever means is most convenient (fax, e-mail, post), please complete the survey below and return at your earliest convenience.

For the alums, students, advisory board, and faculty, thanks for your help! Chuck Drake, drakec@ferris.edu

MET/BS Year	
Name	
Address	
E-mail Address	
Company Name	
Location	
Position (Title)	

SALARY FOR PRESENT POSTION (OPTIONAL): (Include bonuses & overtime, but not benefits).
State a range such as: $30-39k, $40-49k, $50-59k, $60-69k, $70-79k, $80-89k, $90-99k, >100k

Salary Range	

YOUR EDUCATION SINCE BSMET

College/University	Degree	Year Completed

SEMINARS/COURSES (List most recent)

Topic		Duration	
Topic		Duration	

CAREER AVENUE (Indicate a category that best fits your current position)
Examples: design, testing, manufacturing, R&D, sales, other (please describe)

Career Avenue	

ADVANCEMENT Indicate if you have received a promotion, substantial pay increase, moved to a higher position, etc.

Advancement	

Appendix D TracDat Report Example

**Unit Assessment Report - Four Column

Ferris State University

Program - Mechanical Engineering Technology (A.A.S.)

Mission Statement: The Mechanical Engineering Technology program seeks to provide a stimulating learning environment to prepare students for the broad array of technical careers associated with the discipline.

Advisory Board/Committee Meetings: Once per year

Next FSU Academic Program Review: 2010-2011

Accreditation Body: Technology Accreditation Commission - Accreditation Board for Engineering & Technology (TAC-ABET)

Academic Year of Next Accreditation Review: 2009-2010

College: CET

Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
Program - Mechanical Engineering Technology (A.A.S.) - Problem solving - Students will demonstrate ability to apply engineering principles to technical problems. **Outcome Types:** Learning **Start Date:** 08/22/2005 **Outcome Status:** Active	**Assessment Method:** MECH 212 **Assessment Method Category:** Test - Internally Developed - Pre/Post or Post **Criterion for Success:** 80% Success expected.	10/22/2009 - Student Evaluation - Average of Course. Spring 07 - 84.8% Spring 08 - 88.3% Spring 09 - 76.5% **Classification:** Inconclusive **Action:** 1 - No Action Required **Related Documents:** MECH 212	
	Assessment Method: MECH 222 **Assessment Method Category:** Project/Model/Invention **Criterion for Success:** 80% Success expected.		
	Assessment Method: MECH 223 **Assessment Method Category:** Project/Model/Invention **Criterion for Success:** 80% Success expected.		

Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
Program - Mechanical Engineering Technology (A.A.S.) - Experimental study of a component - Student will show that they can conduct an experimental study of a component including data collection, analysis, oral and written presentation. **Outcome Types:** Learning **Start Date:** 08/30/2004 **Outcome Status:** Active	**Assessment Method:** MECH 221 Project **Assessment Method Category:** Project/Model/Invention **Criterion for Success:** An 80% success rate expected		
	Assessment Method: Student Self Assessment MECH 221, now MECH 332 **Assessment Method Category:** Survey - Students **Criterion for Success:** 80% success expected **Related Documents:** MECH 221		
Program - Mechanical Engineering Technology (A.A.S.) - Communication skills - Student will demonstrated oral, written and visual communication skills. **Outcome Types:** Learning **Start Date:** 08/23/2004 **Outcome Status:** Active	**Assessment Method:** MECH 221 Project **Assessment Method Category:** Presentation(Oral) **Criterion for Success:** An 80% success rate for project presentations. **Related Documents:** MECH 122 MECH 221	09/21/2009 - MECH 223, Write and present a study on a topic in Thermodynamics Spring 07 - 61% Spring 09 - 87% **Classification:** Criterion Met **Action:** 1 - No Action Required **Related Documents:** MECH 223 Data	
		09/21/2009 - MECH 122 Powerpoint Presentation, Students Self Analysis Spring 06 - 84% Spring 07 - 86% Spring 09 - 84% **Classification:** Criterion Met **Action:** 1 - No Action Required **Related Documents:** MECH 122 S 07	

Outcomes	Means of Assessment & Criteria for Success / Tasks	Results	Action & Follow-Up
learning. **Outcome Types:** Learning **Start Date:** 08/23/2004 **Outcome Status:** Active	**Criterion for Success:** 95% success rate **Related Documents:** AAS Post-Grad Survey	MECH - AAS 79 62 54 57 68 **Classification:** Criterion Met **Action:** 1 - No Action Required	
Program - Mechanical Engineering Technology (A.A.S.) - Humanities and Social Sciences - The student will broaden their background with study in humanities and social sciences. **Outcome Types:** Learning **Start Date:** 08/30/2004 **Outcome Status:** Active	**Assessment Method:** Standardized exam - Cultural Enrichment by University Gen Ed. Coordinator **Assessment Method Category:** Z - Other - specify **Criterion for Success:** Success rate of 70%	10/22/2009 - Data not available **Classification:** Criterion Not Met **Action:** 2 - Pending Action	10/22/2009 - Current method of evaluating is not readily available and questions tend to be statistic rather than assessing knowledge. A new method needs to be developed or the outcome modif or removed.
Start Date: 08/30/2004 **Outcome Status:** Active	**Related Documents:** MECH 111	1 - No Action Required	
Program - Mechanical Engineering Technology (A.A.S.) - Continuing Education - Students will understand their options to continue their education, not only in the discipline, but in regards to life long	**Assessment Method:** Registration records **Assessment Method Category:** Survey - Students	10/22/2009 - 2004/05 2005/06 2006/07 2007/08 2008/09 MECH - BS 37 36 30 28 37	