Self-Study Report
Mechanical Engineering Technology

Bachelor of Science in Engineering Technology

New Mexico State University

Submitted to:

Technology Accreditation Commission
ABET, Inc.
111 Market Place, Suite 1050
Baltimore, MD 21202-4012

Submitted by:

The Department of Engineering Technology and Surveying Engineering
Mechanical Engineering Technology Program
Foreman Complex, ECIII, Rm 130
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Las Cruces, NM 88003-8001

June 2011

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BACKGROUND INFORMATION

A. Contact Information

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

The primary contact for the visit to the Bachelor of Science in Mechanical Engineering Technology is

Jeff Beasley, Ph.D.
Professor and Department Head
Engineering Technology and Surveying Engineering
Box 30001 MSC 3566
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Las Cruces, New Mexico 88003

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B. Program History

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

In the early 1960's many of the traditional employers of engineering graduates began to express a need for trained technicians. In response, the College of Engineering formed a working group to study the problem. The solution took the form of associate degrees in mechanical, civil and electrical technology. Further, it was decided these degrees should not be offered by the existing departments of mechanical, civil and electrical engineering, but by a new department.

The Technical Institute opened its doors in the fall of 1963 to forty-three students. Professor Louis Kleine was the department head and classes were held in the old Air Mechanics building. 1965 witnessed the first graduating class: sixteen students received associate of science degrees. At the same time, the name of the department was changed to Engineering Technology.

In 1966, an associate degree in electro-mechanical technology was introduced, but dropped a few years later. A one-year drafting certificate program also started at this time. That program was later moved to the Doña Ana Occupational and Education Branch. This facility, currently known as the Doña Ana Branch Community College, still offers a drafting certificate.

In 1968, each of the three associate programs (mechanical, civil, and electrical) were reviewed by ABET and fully accredited. They have remained so to this day.

By the 1970's, demand for even more knowledgeable technicians led to the creation of New Mexico's first four-year engineering technology baccalaureate programs. In 1971 students had their choice of associate or bachelor degrees in mechanical, civil, or electrical technology.

Growing enrollment, increased course offering, and a larger faculty all contributed to a severe space shortage. In 1972, the department moved into Goddard Hall, the second oldest building on campus and a registered historical landmark. In 1982, the old College of Agriculture Dairy Lab was remodeled and added to the Department of Engineering Technology's list of facilities.

In 1984, Dr. George Alexander succeeded the retiring Lou Kleine as department head. Dr. Alexander took the department to a new level when, in 1988, all three of the baccalaureate programs were reviewed by ABET and fully accredited.

Engineering Technology moved once again in 1997 when Engineering Complex III was completed. This modern facility, shared with Industrial Engineering, now houses all offices, classrooms, and laboratories for the department.

To meet the growing demand for trained information technologists, a baccalaureate program in Information and Communication Technology was started in 2005. This non-accredited program is designed to be a two-year "completion" degree for transfer students. Also in 2005, Dr. George Alexander resigned as department head to return to teaching. Dr. Sonya Cooper assumed the role of interim department head in 2005. She was hired as the department head in 2006 and she remained in that position until June 30, 2010. Dr. Jeff Beasley replaced Dr. Cooper on July 1, 2010 and remains in that position.

To address the need for an on campus program in information technology, the department sought approval for an on campus Information Engineering Technology program in 2007. The program was approved and the first students were enrolled in the program in the Spring of 2008. This program had its first graduate in the fall of 2009 and will be seeking ABET accreditation in the fall 2011 visit.

The last general review for the Engineering Technology program was November 6-8, 2005. At that time, the programs, Civil Engineering Technology, Mechanical Engineering Technology, and Electronic and Computer Engineering technology were re-accredited September 30, 2012.

C. Options

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

The Department of Engineering Technology and Surveying Engineering offers the following options, track, and concentrations.

DEGREE: Bachelor of Science in Engineering Technology

MAJOR: Engineering Technology - Civil

CONCENTRATIONS:
Construction Technology (Optional)
Transportation Technology (Optional)
Water/Wastewater Technology (Optional)
Renewable Energy Technologies (Optional)

MAJOR: Engineering Technology - Electronics and Computer

CONCENTRATION: Renewable Energy Technologies (Optional)

MAJOR: Engineering Technology - Information

MAJOR: Engineering Technology – Mechanical

CONCENTRATION: Renewable Energy Technologies (Optional)

MINORS: (The programs that use these minors are listed in parenthesis.)

Digital Electronic Applications (IET, MET)
Information Technologies (ECET)
Manufacturing (MET)
Renewable Energy Technologies (CET, MET, ECET)
Security Technology (ECET)
Surveying Engineering (CET)

Legend
CET – Civil Engineering Technology
ECET – Electronics and Computer Engineering Technology
IET – Information Engineering Technology
MET – Mechanical Engineering Technology

DEGREE: Bachelor of Information and Communication Technology

Note: This is not an ABET program. It is accredited through the university's North Central Accreditation.

DEGREE: Bachelor of Science in Surveying Engineering

Note: This program is accredited through the Engineering Accreditation Commission of ABET.

D. Organizational Structure

Using text and/or organizational charts, describe the administrative structure of the program (from the program to the department, college, and upper administration of your institution, as appropriate).

Engineering Technology is one of seven academic departments within the College of Engineering. Engineering, in turn, is one of six undergraduate academic colleges within New Mexico State University. The organization of the entire institution is shown in Figure 1. Details within the College of Engineering are shown in Figure 2, and details of the Department of Engineering Technology are shown in Figure 3.

In July of 2010, Dr. Jeff Beasley took over as department head from Dr. Sonya Cooper who returned to the Civil Engineering Technology faculty.

Department Organization

Head ……... Jeff Beasley
Associate Head …… Lynn Kelly
Coordinator, Civil Technology ……... Kenny Stevens
Coordinator, Electronics and Computer Technology ….. Lynn Kelly
Coordinator, Information Engineering Technology …… Lynn Kelly & Michael Morrell
Coordinator, Mechanical Technology ……. Craig Ricketts
Coordinator, Information and Communications Technology …….. Jeff Beasley
Director, Security Technology Program……. Michael Morrell
Director, Manufacturing Technology Center …….. Anthony Hyde

The department offers both associate and baccalaureate degrees in Civil, Mechanical, and Electronics & Computer Engineering Technology and the baccalaureate degree Information Engineering Technology. In addition, a distance education baccalaureate degree in Information and Communication Technology started in the fall of 2004. Of these programs, only the bachelor's in Civil, Mechanical, Electronics & Computer and Information Engineering Technology are being reviewed for accreditation.

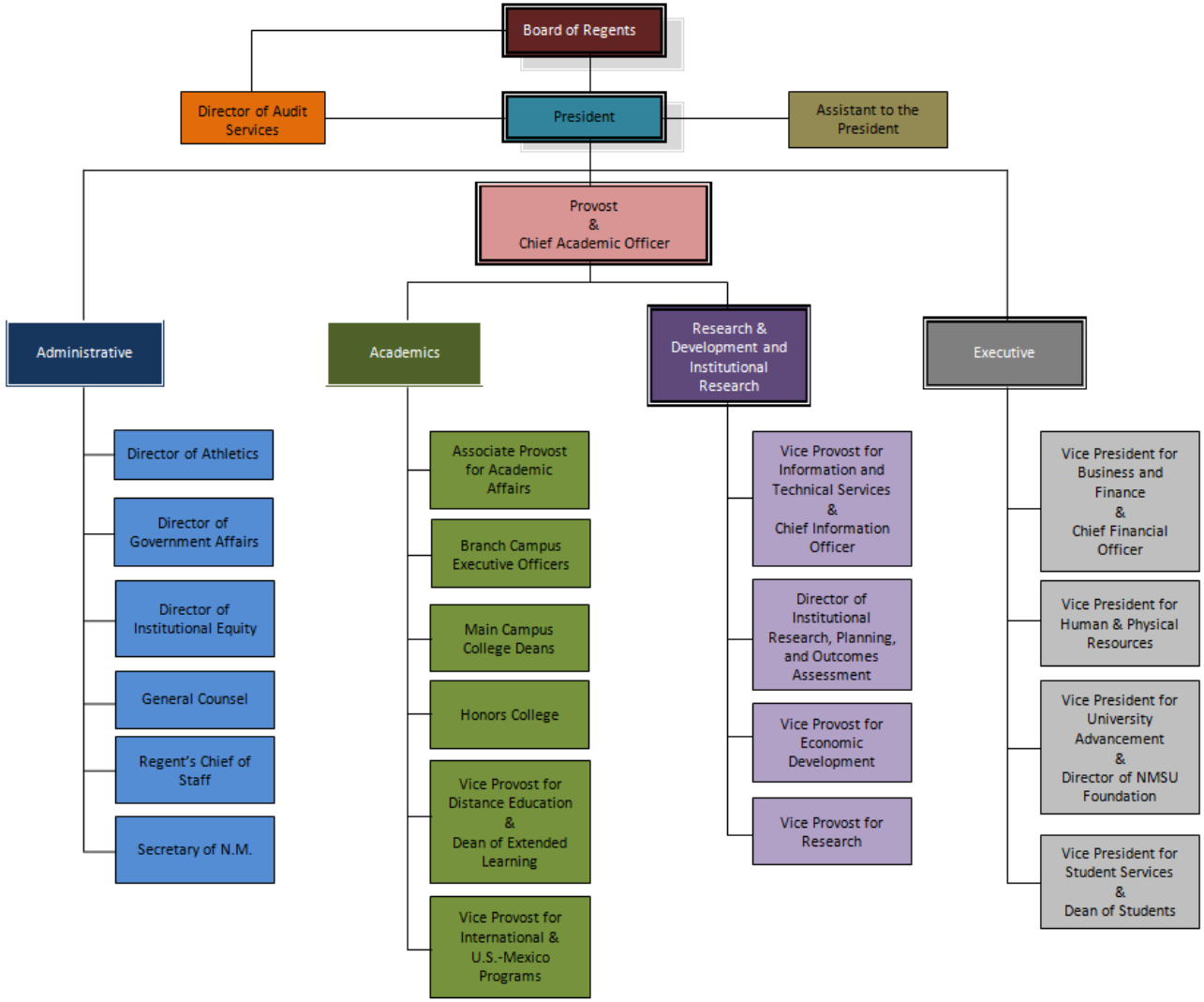


Figure 1. Organizational Chart (University)

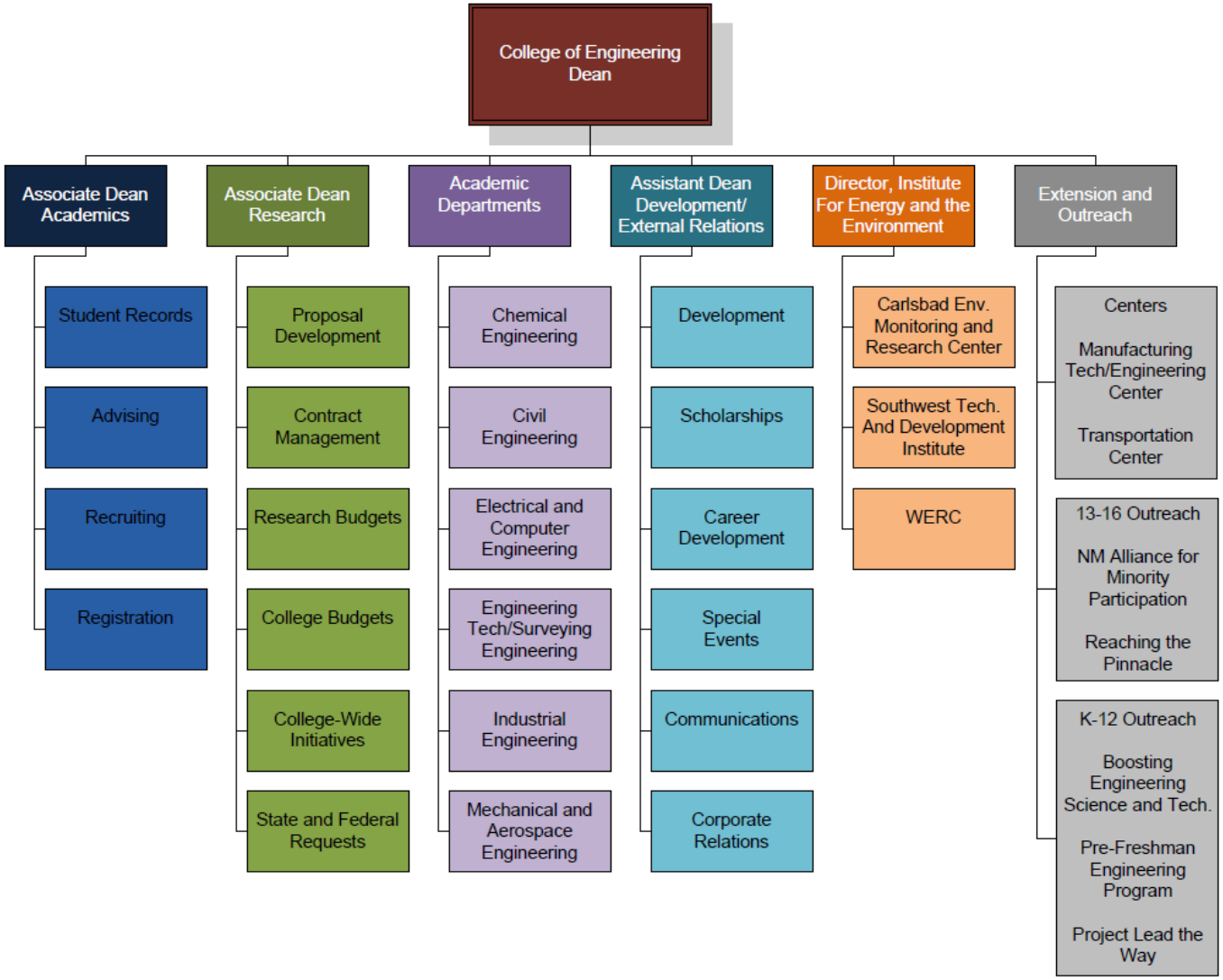


Figure 2. Organizational Chart (College)

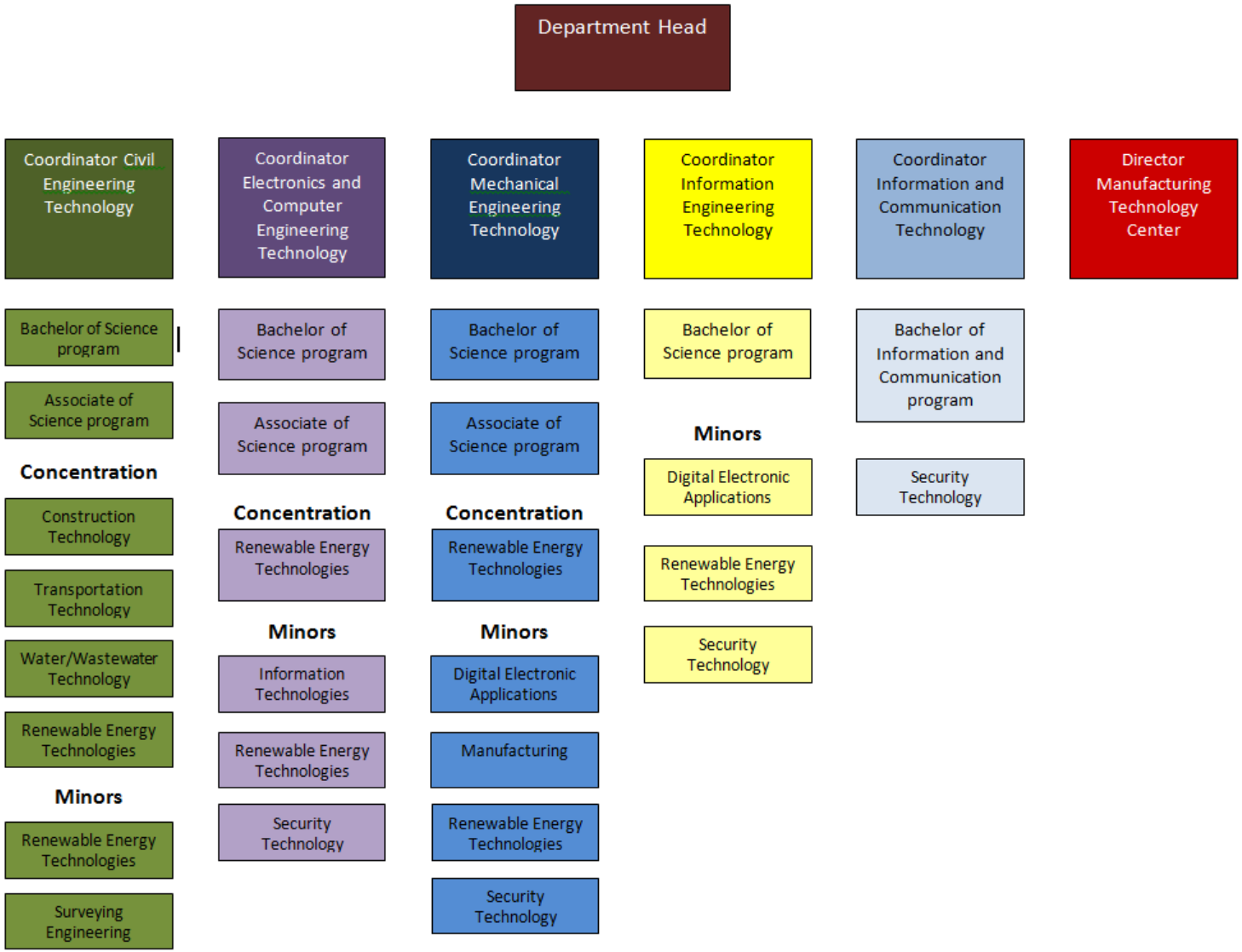


Figure 3. Organization Chart (Department)

Related, Non-Accredited Programs

The Bachelor of Information and Communication Technology (ICT) program is not ABET accredited. This program, initiated in the 2004-2005 academic year, is designed to be a two-year "completion" degree offered by distance. As ICT is a completely distance-delivered program, no physical facilities are required. Most of the ICT classes will have an ECET counterpart, however, whenever an overlap exists, students in the ECET program will have additional or differentiated assignments. A maximum of three ICT classes (nine credits) may be used as technical electives toward an ECET degree. None of them may be classes which have ECET counterparts.

Since 1968, the associate programs in Civil, Mechanical, and Electronics & Computer Technology have been accredited by ABET. However, studies since 1984 have shown that almost 97% of two-year graduates go on to complete a bachelor's degree. The trend in recent years has been to skip the associate degree and go directly to the bachelor. Many students, having completed the requirements for an associate degree, don't even bother to apply for it; opting to complete the bachelor's degree instead. Consequently, the number of students receiving an associate's degree has steadily declined. As a result, the decision was made in 2005 to suspend accreditation of the two-year programs. The programs are still available to interested students.

The coursework required to earn an associate degree is essentially the first two years of that required for the bachelor's. All of the classes, faculty, and facilities used to support the associate degree are shared with the bachelor's degree. No accommodation is made for two-year students. They are expected to perform at the same level as the four-year students. As a result, sharing resources has no impact on the quality of instruction. The extremely small number of two-year students has no effect on the quality or availability of laboratories and other facilities.

E. Program Delivery Modes

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

The classes offered through the department of Engineering Technology and Surveying Engineering program are all daytime classes. The morning classes can start as early as 7:30 AM and the latest class starts at 5:00 PM. The classes are all taught as traditional lecture laboratory classes.

F. Program Locations

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

All programs are offered only on the main campus in Las Cruces, New Mexico.

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

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

NEW MEXICO STATE UNIVERSITY
Las Cruces, New Mexico
INSTITUTIONAL FACTORS AFFECTING
THE ENGINEERING TECHNOLOGY UNIT

Introduction

The Technology Accreditation Commission of ABET, Inc (TAC of ABET) has evaluated the baccalaureate programs in Civil Engineering Technology, Electrical and Computer Engineering Technology, and Mechanical Engineering Technology of New Mexico State University. The visit findings were evaluated using the 2005-2006 TAC Criteria for Accrediting Engineering Technology Programs, applicable program criteria, and the ABET Accreditation Policy and Procedure Manual.

New Mexico State University is the state's land-grant university, serving the educational needs of New Mexico through comprehensive programs of education, research, extension education, and public service. Engineering technology programs are administered through the Department of Engineering Technology within the College of Engineering. The institution has been accredited by the Commission on Higher Education of the North Central Association of Colleges and Schools since 1926, expect for a period in 1940-1941. The engineering Technology programs were initially accredited by TAC of ABET in 1968 and have held continuous accreditation since that time. These programs have been submitted for reaccreditation evaluation.

Note: These findings apply to all programs evaluated, whether or not the findings are specifically cited within each program evaluation.

Institutional Strengths

1. There is a strong support of engineering technology programs by administration at both the College of Engineering and the university level administration. There seems to be a clear understanding of the roles engineering and engineering technology within the College, its seven departments, and the institution. The engineering technology department is enjoying a unique exposure and visibility within the institution as well as in the community. The College of Engineering provides an environment reflective of the typical employment situation where students and faculty in both engineering and engineering technology work together in harmony, while sharing facilities, classrooms, laboratories, computers, and equipment.
2. The support of diversity by the university is commendable. The institution is supporting this very important issue by having programs such as Center for International Programs, American Indian Program, Black Programs, Chicano Programs, Regional Alliance for Science, Engineering, and Mathematics for Students with Disabilities, Squared (RASEM)

project, and New Mexico Alliance for Minority Preparation (NM-AMP). All these programs and projects are focused on increasing the enrollment and retention of existing diversified groups in the region in the areas of Science, Mathematics, Engineering and Technology. The emphasis on diversity provides an excellent environment in which to prepare student for an appreciation of the cultural diversity they will encounter in the workplace after graduation.

3. The recent implementation of the "Viewing a Wider World" program in the general education curriculum is a positive step in preparing all graduates for global challenges and societal issues not taught in a specific program. Once the assessment and continuous improvement of these courses are documented and available, all departments in the College of Engineering will benefit from the external assessment of the so-called "soft skills" that are deemed to be essential in today's workforce.

Institutional Concerns

1. Criteria: Criterion 7. Institutional and External Support states that the institutional support must include:
   a. adequate financial resources to assure the quality of continuity of the engineering technology program
   b. resources sufficient to attract, retain and provide for the continued professional development of well-qualified faculty.
   c. sufficient financial resources to acquire, maintain, update and operate facilities and equipment appropriate for the program

The operating budget of the engineering technology unit has been stagnant during the past five years. This budget includes the monies for travel as well as professional development of faculty, and is smaller than that allocated to the department in 1990's. However, both the Department of Engineering Technology and the College of Engineering, through creative avenues, have maintained faculty professional development and equipment maintenance. The reduced budget has hindered steps that could be taken in areas such as recruitment, retention, outcomes assessment, and contribution to student projects. Therefore, it is required that the institution take steps to insure that the programs have adequate funding to maintain the support services specified by Criterion 7.

14-Day Response: The institution responded that it will consider ways of increasing this budget to allow the programs under the review to reach their full potential.
Status: This funding remains a Concern until appropriate action is taken.

Due Process Response: The College responded that while it has fared no worse than any other educational unity at NMSU, it still lags behind its peers. The college is aggressively pursuing alternative funding resources, and in the last six years, the college has raised revenue to endow 4 chairs and 11 professorships. The college development staff is working to increase the endowment.

Status After Due Process: This finding remains a Concern.

Actions Taken Since Due Process:

PROGRAM EVALUATION
MECHANICAL ENGINEERING TECHNOLOGY
Baccalaureate Degree

Introduction

The Mechanical Engineering Technology program at New Mexico State University prepares graduates with the knowledge, problem solving ability, and hands-on skills necessary to design, install, manufacture, test, evaluate, or maintain the types of mechanical systems encountered in industry. The graduates of the program have the ability to analyze, perform applied designs, develop, implement, or oversee advanced mechanical systems and processes.

The Program Criteria for Mechanical Engineering Technology and Similarly Named Programs as published in the 2005-2006 TAC criteria document also were used to evaluate this program. Findings in meeting the provisions of the criteria and ABET policies are described below.

Note: Findings cited under Institutional Factors also apply to this program.

Program Strengths

1. The subject of "ethics" is effectively integrated in multiple courses in the Mechanical Engineering Technology program. Student work in several courses indicated that the program is providing students with a strong ethical framework to make future responsible decisions.
2. Students have excellent opportunities to integrate education and practice within the environment of the "Manufacturing Technology and Engineering Center". This center's projects exposes the students to real-world challenges and give them access to modern machine shop facilities and equipment as encountered in today's manufacturing industry.

Program Concerns

1. Criteria: Criterion 2. Program Outcomes requires that an engineering technology program demonstrate that graduates have a commitment to quality, timeliness, and continuous improvement. The importance of timeliness does not appear to be addressed as a topic at any point in the curriculum for this program. The program relies on classroom experience "working together with other students and the instructor in meeting the requirements of the class" to prepare students for such commitment to timeliness. There is no evidence to demonstrate that students have developed a commitment to timeliness or an understanding of its importance in the workplace. Although ET 404 Quality and Manufacturing teaches project scheduling concepts, there is no evidence that these techniques are integrated, assessed, or evaluated to demonstrate the development of the student's commitment to timeliness. Therefore the program must determine ways of insuring that the curriculum is developing student appreciation of timeliness in the workplace, and the program must

demonstrate that its students have acquired a commitment to timeliness by the time of graduation.

14-Day Response: The program responded that commitment to timeliness has been assessed as a component of a broader issue. In the future, commitment to timeliness will receive more emphasis in the curriculum and will be assessed as an individual item in the senior capstone course.
Status: This finding remains a Concern until the program demonstrates that its graduates have acquired a commitment to timeliness.

Due Process Response: The institution responded that "timeliness" has been assessed in the required senior project course, but it has been lumped together with assessment of Quality/Timeliness/Continuous Improvement (ABET criterion 2, program outcome k). In the future, where appropriate to do so, a commitment to timeliness will be stressed to students as they progress through the curriculum. It will be then assessed as an individual item in the senior capstone course. In addition, students taking the senior capstone course will be required to demonstrate 1. an understanding of, and 2. a commitment to timeliness by creating a Gantt Chart for at least one project.
Status After Due Process: This finding remains a Concern until the above remedy is integrated and assessed.

2. Criteria: Criterion 3, Assessment and Evaluation, requires that each program utilize multiple assessment measures in a process that provides documented results to demonstrate that the program objectives are being met. Assessments of program educational objectives are defined in the Mechanical Engineering Technology continuous quality improvement plan to include an annual alumni survey of two-and five-year graduates, an annual survey of employers, and a database of job titles and employers of new graduates. However, although this issue was cited in the previous TAC of ABET Final Visitation Statement, no annual employer survey data have been collected, and the job title database is incomplete to the extent that an accurate determination of the portion of graduates placed in appropriate job titles cannot be made. Although the methodology has been defined, it is required that the program effectively implement multiple assessment measures in a process that provides a documented results to demonstrate that the program objectives are being met.
   14-Day Response: The program responded that it would begin conducting employer surveys starting in Spring of 2006. It was also noted that the job title database includes information from 50% of graduates for each semester of past four years; the database is incomplete because of difficulties encountered in follow-up with mobile graduates for whom the program does not have current contact information.
   Status: This finding remains a Concern until the program can demonstrate that its program objectives are being met.

Due Process Response: The NMSU MET faculty will reinitiate conducting employer surveys starting Spring 2006. This should provide invaluable assessment data that will enable the program to make necessary curriculum changes responsive to industry needs.

The job title database is only incomplete in the sense that the Program is not able to gather data from all graduates. It is not uncommon for graduates to leave the area upon graduation without letting the faculty know where they find employment or what their job titles are. In the last four years, the Program has been successful in gathering data from more than 50% if graduates each semester. Having a survey (the tool used in this case) response rate larger than 25% is considered to be adequate based upon historical NMSU College of Engineering survey response rates.

Status After Due Process: This finding remains a Concern until multiple assessment tools are utilized and the results demonstrated. The employer survey data needs to be collected, assessed and evaluated.

Observations for Improvement

1. The equipment in the thermal and fluid science laboratories is mostly old. It is suggested that the department explore opportunities to upgrade this equipment before it becomes obsolete and unable to produce graduates who can use the modern equipment encountered in industry and practice.

Due Process Response: The institution responded that it will be spending $10k on these laboratories in summer of 2006. Also, a college license for Lab View has been purchased. This software will be incorporated in both Thermodynamics and Fluids laboratories.

H. Joint Accreditation

Indicate whether the program is jointly accredited or is seeking joint accreditation by more than one commission.

There are not any Engineering Technology programs in the department that have joint accreditation.

GENERAL CRITERIA

CRITERION 1. STUDENTS

For the sections below, attach any written policies that apply.

A. Student Admissions

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

New Mexico State, as a land-grant institution, has a relatively open admission policy. To be accepted, an entering freshman must meet the following:

- a high school GPA of at least 2.0 and an ACT standard composite score of at least 20, or
- a high school GPA of at least 2.5, or
- an ACT standard composite score of at least 21

In addition, the candidate must meet the following minimum high school requirements:

- 4 years of English, two of which must be composition, one at the junior-level,
- 2 years of science beyond general science,
- 3 years of mathematics, taken from: algebra I, algebra II, geometry, trigonometry, or advanced math, and
- 1 year of foreign language or fine arts.

A student who has a single deficiency from the list above will be admitted if the high school GPA is at least 2.25 and the ACT standard composite score is at least 20.

A student who meets the minimum high school requirements listed above, with a high school GPA of at least 2.25 and the ACT standard composite score of at least 19 will be admitted on provisional status. Provisional students must take at least 6, but no more than 12, credits per regular semester (3-6 during summers). Those students who earn at least a 2.0 GPA within two semesters are moved to regular admission status, the others are denied further attendance.

Students denied admission may appeal to the University's Undergraduate Admission Appeals Committee and/or enroll at a community college until the deficiencies are removed.

Admission to the Department of Engineering Technology is open to any NMSU student. Neither the department nor the College of Engineering place any admission standard on students beyond those set by the University. To officially declare a major in Engineering

Technology, a student need only visit the College of Engineering registration clerk and make the request. The student's records will be modified to indicate Engineering as the primary college and engineering technology as the major.

Math Placement

All engineering technology programs assume students are ready to take College Algebra as beginning freshmen. Naturally, incoming students would like to begin with College Algebra. However, to keep the quality of instruction high, the University has a vested interest in starting students at a math-skill appropriate level. In an effort to advise students into the highest-level math classes for which they are prepared, the Department of Mathematical Sciences enforces a strict guideline to determine initial math enrollment. Students with ACT Math (ACTM) scores below 17 are placed directly into developmental math classes at the Doña Ana Branch Community College, see the table below.

Students with ACTM scores above 16 must take a Math Placement Exam (MPE) to establish eligibility for higher-level classes. Although the MPE is not mandatory, without it, students are only allowed to enroll in the developmental math classes. Since all engineering technology student's want to start as far along in math as they can, the MPE has become a *de facto* entrance requirement for all technology programs.

The Math Placement Exam consists of four 10 question sections. Each section covers the material taught in a different math class: (a)Algebra Skills, (b)Intermediate Algebra, (c)College Algebra, and (d)Trigonometry. Correctly answering 60% of the questions in a given section allow the associated class to be skipped. MPE scores are reported as a set of four integers, indicating the number of questions correctly answered in each section. Thus, a score of 10,8,9,4 means the student answered all ten of the questions on (a)Algebra Skills correctly, missed two questions in the (b)Intermediate Algebra section, missed only one question on (c)College Algebra, but only got four correct in (d)Trigonometry. This student would be placed into Trigonometry. The rules for math placement are provided in Figure 1-1.

Math Course		Minimum		Prerequisite for
Number	Title	ACTM	MPE	Direct Entry
CCDM 103N	Computational Skills	<= 15	N/A	None
CCDM 114N	Algebra Skills	>= 16	N/A	CCDM 103N
MATH 120	Intermediate Algebra	>= 16	a >=6	CCDM 114N
MATH 121	College Algebra	>= 16	a+b>=12	Math 120
MATH 190	Trigonometry and Pre- Calculus	>= 16	a+b+c>=19	Math 121
MATH 235	Calculus I	>= 16	6,6,6,6	Math 190

Figure 1-1. Initial Math Placement

The Associate Dean of Engineering for Academics may, under special circumstances, recommend a student be placed in a math course other than the MPE results would indicate. Such placement is rare and must be accepted by the Department of Mathematical Sciences.

English Placement

Entering freshmen with ACT English (ACTE) scores of less than 16 are placed directly into developmental English at the Doña Ana Branch Community College, see Figure 1-2.

English Course		Minimum ACTE	Prerequisite for Direct Placement
Number	Title		
CCDE 105N	Effective Communication Skills	1-12	None
CCDE 110N	General Composition	13-15	CCDE 105N
ENGL 111G	Rhetoric and Composition	16-24	CCDE 110N
ENGL 111H	Rhetoric and Composition-Honors	25-36	

Figure 1-2. Initial English Placement

Advanced Placement

Students who have completed college-level courses in high school and have scored at least 3 on the Advanced Placement Examinations of the College Examination Board will be granted college credit. The amount of credit and the equivalent University courses for which credit will be granted is determined by the head of the department in which the equivalent course is offered. Such credit will be treated as transfer credit without a grade, will count toward graduation, and may be used in fulfilling specific curriculum requirements or course prerequisites.

Upper Division Admission Requirements

Students are not allowed to enroll in upper division coursework (300 or above) until they have demonstrated basic skills in English and mathematics. Engineering Technology students satisfy their basic skills requirements once they have completed ENGL 111G, MATH 180 and Math 185.

Transfer students may satisfy the basic skills requirement with prior credit. Those with at least 45 credits are allowed to enroll in upper division courses for one semester. This semester of grace allows the transfer student to demonstrate the basic skills (i.e. complete ENGL 111G, MATH 180, and/or MATH 185) or, more commonly, lets the transfer credit catch-up to the student. After the semester of grace, transfer students must adhere to the same upper-division admission requirements as any other student.

Provisional Admission

A new student, other than a transfer student, who does not meet requirements for regular admission may be admitted under the provisional program. To be admitted to provisional status, students must:

1. have a minimum high school grade-point average of 2.25 and ACT composite score of 19 and meet all the minimum high school unit requirements listed above or
2. have met all but one of the minimum high school units listed above and
    a. have a high school grade point average of at least a 2.50 or
    b. have a high school grade point average of a 2.00 and an ACT standard composite score of 20 or
    c. have an ACT standard composite score of at least 21. Such a student must take at least 6, but not more than 12 credits, in a regular semester, and at least 3, but not more than 6 credits, in a single summer session.

A provisional student earning a 2.0 grade-point average or higher in at least the minimum number of credits as stated above will be granted regular admission. Should the provisional student earn less than a 1.0 grade-point average in the first semester, further attendance will be denied.

A provisional student earning less than a 2.0 grade-point average, but more than a 1.0 grade-point average in at least the minimum number of credits as stated above, in the first semester may continue for one additional semester. However, a provisional student who fails to attain a 2.0 grade-point average during the second semester will be denied further attendance. Students who are denied further attendance may reapply to NMSU after they have completed a minimum of 24 credits with a 2.0 GPA at another regionally accepted institution.

Home School Students

Students enrolled in a home school program may be accepted to NMSU if they meet the requirements for regular or provisional admission as previously stated. In addition, the home school educator must submit a transcript or document that lists the courses completed and grades earned by the student and also indicates the date the student completed or graduated from the home school program. Home school students who are New Mexico residents and wish to participate in the Lottery Success Scholarship program are required to submit official New Mexico GED test results.

Basic Academic Skills and Admission

In order to succeed at their college studies, entering students are required to have basic skills in mathematics and writing befitting the university environment. Students are evaluated using ACT test scores or diagnostic testing at the time of registration to determine basic academic competency. Based upon this evaluation, the university will require entering students to correct deficiencies by completing coursework in English and mathematics before enrolling in courses numbered 300 and above.

Admission by GED

Any student who has successfully completed the GED may apply for admission. Students are encouraged to submit an official high school transcript of the work they completed in addition to their GED scores. The admission will depend upon satisfactory scores on the General Educational Development (GED) test and the American College Testing Program (ACT) test, and a review of minimum high school unit requirements.

Readmission (Degree Seeking)

Former students of NMSU, or of one of its Community Colleges, who have been out of school for more than two consecutive terms are required to make formal application for readmission. Applications should be submitted to the Office of University Admissions at least 30 days before the opening of the semester or summer session for which the student plans to enroll.

A student who has attended other institutions during an absence must have official transcripts forwarded directly to the Office of University Admissions by the registrar of each institution and must be eligible to return to the college or university last attended. Transcripts must be received prior to the date of registration. Admission status at the time of readmission will normally be determined by previous NMSU academic standing. However, academic performance at other institutions attended during the applicant's absence from NMSU may be taken into consideration in determining the student's admission status.

B. Evaluating Student Performance

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

EVALUATING STUDENT PERFORMANCE – The university uses the advising system called STAR (Student Academic Requirements) to track student progress. This software enables students, staff, and faculty to run up-to-date degree audits using the Internet. All of the degree programs offered by the department of Engineering Technology and Surveying Engineering are available on STAR.

After logging in, the students or advisors select the correct college/campus and then select the program and catalog year in which they have an interest. After clicking on "Submit a New Audit," the audit is placed into the queue. Once it is completed, you can click on the "Details" button to view it.

The Student Academic Requirements (STAR) report is an automated degree audit that reflects the student's progress in a specific academic program. Audits can be run for the particular major in which the student is enrolled. Additionally, an audit can also be run to determine the student's progress towards a minor.

ADVISING - Currently, new or prospective students meet with the department head to gather background information on the student and to discuss our programs. The student is then directed to the program coordinator of the specific discipline for further consultation and to place them in the correct classes. Other faculty members or the department head assist with this if the program coordinator is unavailable.

The department has an internal database that was developed by the department using Microsoft Access that enables the faculty and the department head to keep track of student advising and any other communication with the student. A sample advising document generated by the software is provided in Figure 1-3. This document has places for the student name, Banner ID (student university number), email address, and the catalog year the student is using.

Additionally there are check boxes that are used by the advisor to track student progress. There are specific check boxes for Social/Behavior Sciences, Humanities/Fine Arts, English and Communications, Math and Science, and also the requirements for completing the MET degree.

The advising document has space for advisor notes, course substitutions, and an area for action items that require immediate attention. This document is updated when a student comes in for advising. The student is given a copy and the updated form is saved to the database. All faculty and the department head have access to this software.

In Figure 1-4 is a flowchart for the academic program. This flowchart visually shows the students the pre-requisite requirements for a particular class. This flowchart is used to guide the student through the degree program and provide them with a list of the courses required as well as if the course is Fall/Spring or if it is offered every semester.

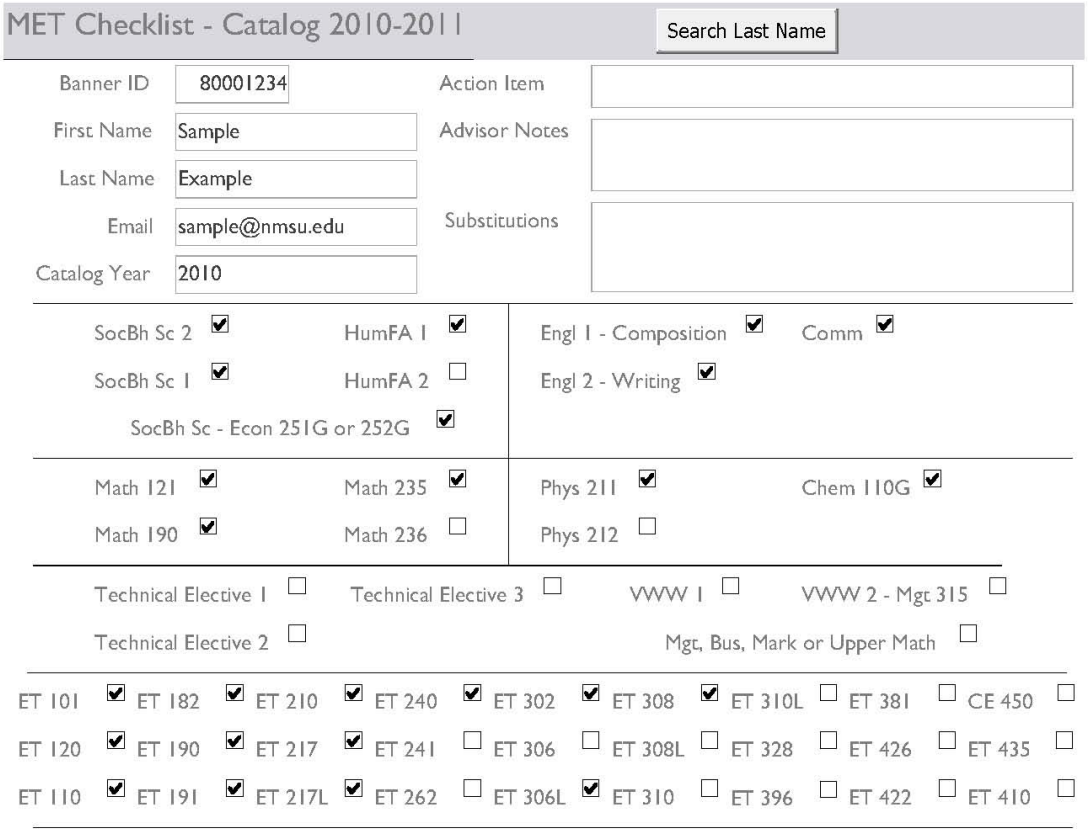


Figure 1-3 A sample advising document generated by the department's database software.

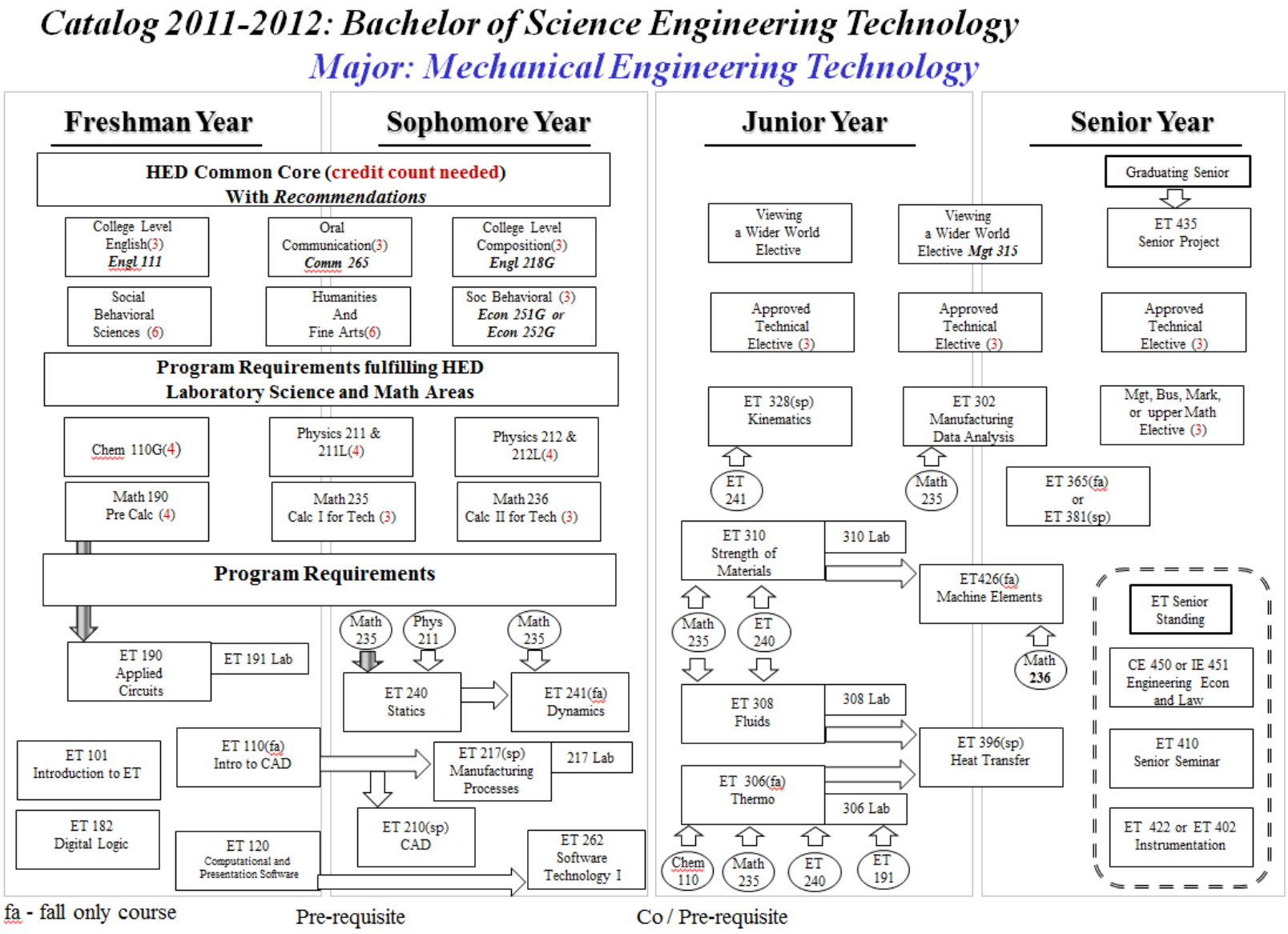


Figure 1-4 The advising flowchart for the Mechanical Engineering Technology program.

MEETING PREREQUISITES -

The system used by the University for enrolling students into classes is called Banner. This software has a built-in list for making sure students have met the proper pre-requisite requirements for taking a class. This pre-requisite list is prepared by the department and submitted to the registrar's office and is then entered into the degree program database. If a student attempts to register for class in which he/she has not met the pre-requisite requirement, Banner will flag the class and notify the student that they have not met course pre-requisite requirements.

Additionally, an advising hold is placed on all students Banner accounts. This prevents the students from registering for classes until they have been advised. Once the students have been advised, the advising hold is removed and the students will be able to register. This database is updated by the department as needed to reflect changes in the course catalog.

In some cases, a student will request a waiver for a pre-requisite. This is rare but sometimes a transfer student will need to have a pre-requisite requirement removed. The memorandum shown in Figure 1-5, was first issued in March, 2006 to address waiving pre-requisite requirements.

MEMORANDUM

Date: March 10, 2006

To: Engineering Technology Faculty and Staff

From: Sonya L. Cooper, Head – Engineering Technology

Subject: Prerequisites

Effective for Summer 2006 and Fall 2006 classes, prerequisite forms must be filed with the ET Department for any student not meeting these requirements. A copy of the Petition for Prerequisite Waiver form was distributed earlier this spring in your mail box. Additional copies are in the ET office.

Figure 1-5 Memo specifying a requirement for preparing a pre-requisite form.

RETENTION- Each semester the Associate Dean for Academics sends a list of students that did not return after enrollment the previous semester. This list is distributed to faculty members by the department head. Normally these students are discussed in faculty meetings and at that time faculty volunteer to contact these students to ascertain how we may help to bring them back.

C. Transfer Students and Transfer Courses

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

Transfer students from other colleges or universities may be accepted for undergraduate studies if they have at least a 2.0 cumulative grade-point average and are eligible to return to the college or university last attended. Transfer students who have less than 30 credits have to meet first-time freshman admission requirements.

Transcripts

The transfer student must have official transcripts forwarded directly to the Office of University Admissions by the Registrar of each college or educational institution previously attended. The ACT or SAT may be required of students who have not earned credit for the first semester of college English. A student who conceals the fact that he or she has attended another college or university, and who has not had the registrar submit a transcript for each institution whether or not credit was earned, will be subject to immediate suspension. Transcripts must be received before the date of registration. Students submitting transcripts from a foreign post-secondary institution are required to have the credentials evaluated by a nationally recognized credentialing service. NMSU requires a "Comprehensive Course by Course Evaluation" be completed for each post-secondary institution attended. Contact the Office of University Admissions for approved credentialing organizations.

Transfer of Credits at NMSU

NMSU evaluates courses from postsecondary institutions that are regionally accredited or are candidates for regional accreditation. Transfer students will receive full credit for coursework completed with a grade of C or better, provided the classes are similar or equivalent to courses offered at NMSU. A transfer student may, on the basis of an evaluation of his or her transcripts, receive credit for courses taken at other institutions in which a grade of D was received. However, NMSU does not accept the transfer of courses with D grades that satisfy basic academic competency (basic skills) in English and mathematics. NMSU will not accept transfer credit for 4 credit basic skills courses (such as ENGL 111G and CCDM 114 N) when the incoming course carries less than 3 credit hours. Also, colleges or departments may choose to accept only courses graded C or higher in their programs for both transfer and native students. Any lower-division course from another institution receiving transfer credit from NMSU at the 300 or above level will still count as a lower-division course. Transcripts will be reevaluated when students transfer from one NMSU college to another.

Each college determines which transferred courses are applicable toward a degree or a minor.

Grades earned in courses taken at other institutions are not included in the calculation of the NMSU GPA, except for grades earned by approved National Student Exchange students.

Community/Junior College Transfers

Community/junior college transfer students may be admitted and classified on the basis of acceptable credits earned at a two-year institution. However, transfer students are subject to the same graduation requirements as other NMSU students, including the required minimum number of credits from courses numbered 300 or above and the requirement that the last 30 credits must be earned through this university.

Evaluation of Transfer Credits

Once a student has been admitted to NMSU, an evaluation of credits on a course-by-course basis is submitted to the college (by the Registrar's Office) to which the student is admitted. The student's academic dean approves those transfer courses that are acceptable toward a degree or a minor.

Credits from non-accredited institutions may be evaluated by the student's academic dean after the student has completed two semesters in full-time status with satisfactory grades.

Currently enrolled students must obtain prior approval from their academic dean before work taken at another institution may apply toward meeting graduation requirements.

Religious Center Courses in Religion

Courses in religion, offered by the various religious centers through higher educational institutions with which they are affiliated, are open to all students, and these or similar courses from other universities may be transferred for credit to this university. If a student wishes to have earned credits transferred to NMSU, the following procedures must be observed:

- Obtain written approval from the academic dean prior to registration for the course at the religious center
- Count the credit in the course as part of the total semester load
- Following completion of the course, request that the institution granting the credit send a transcript of the credit to the registrar at NMSU

Registration for these courses in religion is separate from NMSU's registration and is conducted by the religious center offering the course.

Not more than 6 credits in such courses may be transferred to NMSU.

Transferring Courses to Fulfill the New Mexico General Education Common Core

During the 2005 New Mexico Legislative session, Senate Bill 161, consistent with requirements of state law (Chapter 224 of the Laws of New Mexico, 1995 as amended) was signed into law to further enhance and facilitate the articulation of general education courses among New Mexico's colleges and universities. In accordance with policies established by

the New Mexico Higher Education Department, designated general education core courses successfully completed at any regionally accredited public institution of higher education in New Mexico are guaranteed to transfer to any New Mexico public institution. Students who have decided on a major and/or an institution at which to complete their studies should consult with an academic adviser at that particular institution to determine the most appropriate course selections. Students enrolling for the first year of study at a New Mexico college or university and considering possible transfer into a certificate and/or degree program at another institution are encouraged to take the courses approved for transfer during their freshman and sophomore year of study.

The core matrix of approved courses guaranteed to transfer and meet general education requirements at any New Mexico college or university can be found on the New Mexico Higher Education Department web site at www.hed.state.nm.us. Courses are listed by institution, whether university or community college, under each of the five general education areas. The courses for New Mexico State University are listed in the required courses section of this catalog.

Transferring Courses Within Degree Programs

To facilitate the transfer of courses within certain degree programs, New Mexico colleges and universities have collaborated to develop transferable discipline modules. These are made up of an agreed upon number of hours and courses. When discipline module courses are taken in addition to the 35 hour general education core, the total number of hours in a transfer module are approximately 64.

For information on the transferable discipline module for Business, see the College of Business chapter. For information on the transferable discipline module for Early Childhood Education chapter. Information on all available statewide transfer modules can be found on the New Mexico Higher Education Department web site at www. hed.state.nm.us.

Student Responsibility

Planning for effective transfer within maximum efficiency is ultimately the student's responsibility. Responsible transfer planning includes early and regular consultation with the intended degree-granting institution to assure that all pre-transfer coursework will meet the requirements of the desired degree.

Transfer Credit Appeal Process

All New Mexico public post-secondary institutions are required to establish policies and practices for receiving and resolving complaints from students or from other complainants regarding the transfer of coursework from other public institutions in the state. A copy of NMSU's transfer credit policy may be obtained from the Office of the Registrar or from the Deputy Secretary for Academic Affairs, Higher Education Department, 2048 Galisteo St., Santa Fe, New Mexico 87505-2100.

National Student Exchange (NSE)

Courses transferred back to NMSU by students participating in the National Student Exchange (NSE) Program will be evaluated as NMSU courses and recorded on the student's academic record. All computable grades earned will be included in calculating the student's cumulative grade-point average.

Processing for Completing Exceptions

Exceptions can be submitted to the Academic Dean of Engineering for the following reasons.

Exception Type:

Degree Requirement Substitution (allow a non-standard course to satisfy a requirement)
Degree Requirement Waiver (allow graduation without satisfying a requirement)
Pre-Requisite Waiver
Change Transfer Evaluation (change an existing transfer evaluation)
Request Foreign Transfer Credit (allow credit for work done abroad)

D. Advising and Career Guidance

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

Advising - Advising begins with new student orientation for freshmen the summer before the start of their first semester at NMSU. During the orientation, the students will do the following;

- Be given an overview of the university and university life
- Take the Math Placement Exam
- Meet with an advisor from Engineering Technology. The advisor is typically the department head.

Once students are enrolled in the programs, the students are then advised by the faculty in the Mechanical Engineering Technology program or by the department head. The students are advised on a regular basis. The procedure for advising is described as follows.

Mechanical Engineering Technology
Advising and Registration Guide

Step 1.

Collect relevant registration materials to consist of:

(a) A print-out of your STAR audit transcript
(b) Relevant Schedule (s) of Classes;
(c) The list of Viewing a Wider World courses;
(d) The New Mexico General Education Common Core (GECC) courses in the undergraduate catalog under which you plan to graduate; and
(e) The plan of your course schedule up to graduation

Step 2.

Draft a schedule, keeping in mind the following:

(a) Use the prerequisite flowchart (see back side) to check pre-requisites and co-requisites and identify long course sequences that can affect the number of semesters required to complete the degree program
(b) Be aware that the following core courses are typically offered Spring Only: ET 210, 217, 328, 381, 396.
(c) The following Spring 2011 courses can typically be used by MET majors as technical electives: ET 300, 305, 344, 362, 381, 382, 400, 418, 444, and 482. See your advisor regarding ICT courses of interest to you.

Summer 2011 courses: ET offerings will most likely be limited to distance education during
Summer 2011.

(d) Choose humanities and social science electives (HSSE's) carefully from the list of approved courses that is available in the ET Office. Your HSSE"s need to be distributes between two categories (see areas and code of Table 1) in order to meet both NMSU"s General Education Requirements and the NM General Education Common Core (GECC). The codes for these categories are shown in Table 1 and match labels in the MET Flowchart on the following page.

Table 1: Cross listing of HSSE Areas 1-6 and GECC Areas IV and V, by HSSE Code

HSSE Area	GECC Area
1. Historical Perspectives (HP)- one course	V
2. Human Thought & Behavior (HT&B)- one course	IV
3. Social Analysis (SA)- one of two ECON courses	IV
4. Literature & Fine Arts (L&FA)- one course	V
5. Viewing a Wider World (VWWII) One course from any of the following colleges: (1) Agriculture & Home Economics (2) Arts & Sciences (3) Education or (4) Health and Social Services	NA
6. A second Viewing a Wider World (VWWII) course chosen from the College of Business and Economics (listed on flowcharts as MGT 315G or…) Alternatives include MGT 345G, MGT 360G, MGT 388G, FIN 303G, FIN 380G, BA 365, or BLAW 385G.	
One course from GECC Area IV or V	IV or V

You need 15 credits in the HSSE area for Undergraduate Catalogs dated after 2006/2007

Spring and Summer Semesters

Step 3.

Meet with your advisor to discuss your draft schedule. Have your advisor sign your completed course request card, or an alternative copy of your schedule, even if you are planning to register on-line. The following advisor assignment by the first letter of your last name is suggested. However, you may choose an advisor of your choice. Those planning to earn the Manufacturing Minor should consider the second listed advisor as a recommended first choice.

A-D	**Manuel Gomez**	**EC111-284**	**646-2512**
E-L	**Anthony Hyde**	**EC111-284**	**646-5029**
M-Z	**Craig Ricketts**	**EC111385**	**646-3388**

Step 4.

Once you have an approved class schedule signed by an advisor: the MET Coordinator, or Carol Serna can clear the on-line registration hold. This will enable you to register online.

Alternatively, you may register by taking your signed course request card to Cindy Adair in Goddard Hall, Room 106.

Prospective graduates. If you are planning to complete graduation requirements at the close of the next semester or summer session, please make an appointment for a record check with Dr. Beasley, the ET Department Head. You can also pick up a Degree Application form that is due at the Registrar's Office by *21 January*, for May graduates. For Summer 2011 graduates, the deadline is *09 July*.

Closed classes. Use an ADD/DROP slip to add a closed section, obtaining the signatures of your advisor, the instructor of the course, and the department head of the department offering the course. Occasionally, sign-up sheets are used to control the size of sections of ET courses/labs. Inquire in the ET Office to find out whether an ADD slip or sign-up sheet is appropriate for a specific ET class that is closed.

Mechanical ET Technical Electives

A technical elective is any class, numbered over 300, in the College of Engineering that advances the student's competence level in their area of interest. Classes numbered 300 or above outside of the College of Engineering may be approved for use as a tech. elective if the technical content of the class is deemed sufficient.

What follows is a list technical electives and the corresponding basic study areas that have been used by MET students.

Building Utilities

ET 365	Building Utilities
ET 374	Electric Power Distribution
ET 396	Heat Transfer and Applications
ET 401	Heating & Air Conditioning Systems

Security Technology

ET 339	Computer Forensics
CJ 321	Criminal Investigation and Intelligence
ET 402	Instrumentation

Manufacturing, Materials, Software

ET 317	Manufacturing Technology
CH E 361	Engineering Materials
ET 320	Applications Software

Career Guidance - The department begins advising students about their career path in the ET 101 Freshmen Orientation class. The students learn about career opportunities and are required to attend the on campus career fair.

Career advising continues throughout their academic program through on campus visits to classes that recruit our Engineering Technology students.

Career guidance and advice continues on into the student's senior year via the ET 410 Senior Seminar class. This class features presentations on preparing and taking the Fundamentals of Engineering exam, the steps for becoming a registered Professional Engineer, preparing a resume, how to deal with life after graduation, and career advice from practicing engineers describing what it is like to work on Engineering and Technology field.

E. Work in Lieu of Courses

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

The college does not have a process for awarding credit for work in lieu of courses. However, students who feel that they have already mastered a topic can elect to take a challenge exam that is developed by the faculty. The challenge exam reflects the knowledge base a student is expected to have mastered by the end of the particular course by the end of the semester. If the student passes the challenge exam the Associate Dean of Engineering is notified and he/she will be awarded credit for the class.

F. Graduation Requirements

Summarize the graduation requirements for the program and the process for ensuring and documenting that each graduate completes all graduation requirements for the program. State the name of the degree awarded (Master of Science in Safety Sciences, Bachelor of Technology, Bachelor of Science in Computer Science, Bachelor of Science in Electrical Engineering, etc.)

Graduation

New Mexico State University enforces certain minimum requirements on all degree programs. In brief, the minimum requirements are:

- Completion of 128 credits,
- Demonstrated basic skills in math and English
- Completion of 48 credits in courses numbered at least 300,
- A cumulative GPA of 2.000, and
- The last 30 credits must be earned at NMSU.

The College of Engineering enforces certain requirements on all engineering degree programs. In brief, the requirements are:

- A grade of at least C in any class used to satisfy a prerequisite requirement, and
- A grade of at least C in all required lower-division science, technology, engineering, and math classes.

Each technology program has published the specific course requirements which must be fulfilled to earn a degree.

Early in the semester during which graduation requirements are expected to be completed, a student must file a Notice of Degree Candidacy in the registrar's office. The names of those engineering students who have filed the notice are forwarded to the Associate Dean of Engineering for Academics. The candidate names are then passed to the appropriate departments. The coordinators of the various engineering technology programs check each student's academic record against the program's degree requirements. Each technology program has a form used to indicate the status of each degree requirement for each student. Samples of these check sheets are shown on the following pages.

The result of each record check is forwarded to the Associate Dean's office for final validation. The Records Specialist in the Associate Dean's office goes through each record check to verify its accuracy. Finally, the Associate Dean goes through the records checks as a third and final verification. Inconsistencies such as missing classes, unacceptable grades, or invalid elective choices are brought to the attention of the technology program coordinator and an explanation requested. If the inconsistency is resolved, the Associate Dean endorses the record check, signifying that all degree requirements have been met. Unresolved inconsistencies result in the student being informed of the problem and advised they will not graduate until the situation is corrected. In all events, the registrar is notified of the Associate Dean's decision.

G. Transcripts of Recent Graduates

The program will provide transcripts from some of the most recent graduates to the visiting team along with any needed explanation of how the transcripts are to be interpreted. These transcripts will be requested separately by the team chair. State how the program and any program options are designated on the transcript. (See 2011-2012 APPM, Section II.G.4.a.)

Student transcripts will be provided upon request.

CRITERION 2. PROGRAM EDUCATIONAL OBJECTIVES

A. Mission Statement

Provide the institutional mission statement.

New Mexico State University (NMSU) is the state's land-grant university, serving the educational needs of New Mexico's diverse population through comprehensive programs of education, research, extension education, and public service.

In alignment with the mission of the institution, that of the NMSU Department of Engineering Technology and Surveying Engineering is: *to provide students with a quality engineering technology and surveying education that links theory and application, incorporates a rigorous, fundamental education, and enhances the career opportunities of graduates.*

The department's goals in support of this mission include:

1. to provide educational and social environments that promote and facilitate student learning,
2. to have a highly respected and visible department,
3. to foster the development of the department, and
4. to graduate students who are competent and sought after by industry

B. Program Educational Objectives

List the program educational objectives and state where these can be found by the general public.

The baccalaureate degree curriculum of the Mechanical Option in Engineering Technology at New Mexico State University will prepare graduates with the knowledge base, problem solving abilities, and practical skills of mechanical aptitude necessary to enter careers that involve the design, installation, manufacture, testing, evaluation, technical sales, or maintenance of mechanical systems encountered in industry, consulting, or government. Graduates will have the ability to analyze, perform applied design, develop, implement, or oversee advanced mechanical systems and processes.

After degree completion and following 2-5 years of employment in a field-related technical area, graduates will demonstrate competence in a specialty area, or in the management of technical personnel. This is facilitated by a curriculum designed not only to provide a broad scope of technical knowledge, but also to emphasize the understanding of fundamental principles, the utilization of modern tools, and the importance of communication and team skills.

In conjunction with the closely-related student outcomes, the above program educational objectives are intended to help ensure that graduates may better compete in a changing world.

The Program Educational Objectives may be found by the general public at:

http://etse.nmsu.edu/accreditation/outcomes_met.html

C. Consistency of the Program Educational Objectives (PEO's) with the Mission of the Institution

Describe how the program educational objectives are consistent with the mission of the institution.

The program educational objectives emanate directly from the Institution's mission to serve the needs of New Mexico's diverse population and cultures, in part by providing comprehensive educational programs. The objectives serve the mission of New Mexico State University through a resulting curriculum that broadens the foundation of technical knowledge and skills required of graduates to be successful. The use of current technology and tools is stressed and fundamental principles are emphasized, so that graduates may compete in a changing world. They are thus prepared to enter the professional/technical workforce - both locally and regionally - or to pursue postgraduate education, nationally or internationally.

D. Program Constituencies

List the program constituencies. Describe how the program educational objectives meet the needs of these constituencies.

The following constituencies have been identified by the mechanical engineering technology faculty in coordination with the Industrial Advisory Committee:

· Employers of Program graduates,
· Graduates of the Program,
· Students enrolled in the Program,
· Professional societies such as
  The American Society of Mechanical Engineers (ASME)
  The American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE)
  The Society of Manufacturing Engineers (SME)
  The American Society for Engineering Education (ASEE), and
· NMSU faculty members and administrators of affiliated departments
  A faculty member or graduate from the Department of Mechanical Engineering
  The Department Head of the Department of Industrial Engineering.

Representatives of these groups typically make up the active members of our Industrial Advisory Committee. Our current members are listed in Criterion 5C.

In addition, the citizens of the State of New Mexico, the MET Industrial Advisory Committee (IAC), and the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology (TAC of ABET), are also considered to represent constituencies.

By providing Mechanical Engineering Technology Program graduates with the technical education needed to start along the path of a professional career, program constituencies' needs are met in various ways. Citizens of the State are served not only by economic development enhanced by the benefits of higher education, but also through the increased income potential of relatives. A high percentage of graduates represent families having no college graduates in recently preceding generations.

Employers can access a larger and more diverse pool of qualified graduates. Graduates obtain an education attractive to employers recruiting for professional, entry-level positions that offer strong potential for professional and leadership development and an improved standard of living.

Mechanical Engineering faculty members gain better insight into the commonalities and differences between the missions and curricula of the engineering and engineering technology disciplines. This helps facilitate prospective synergy or collaboration in educational and research endeavors. The Industrial Engineering Department can count upon a greater number of qualified applicants who subsequently help to widen the diversity of graduates from its Master's degree program.

Additionally, local and regional chapters of professional societies expect to attain more diversified and growing memberships with participation by increasingly more qualified members. Moreover, through the bringing together of individual constituencies within one forum and helping to meet their needs, the varied best interests of the IAC as a whole are served in a synergistic way.

And finally, familiarity with and meeting guidelines for program accreditation helps contribute toward maintaining a strong and viable national education accreditation entity (ABET TAC) which is essential to helping sustain the economic underpinnings of a nation-based society over the long term.

E. Process for Revision of the Program Educational Objectives

Describe the process that periodically reviews and revises, as necessary, the program Educational Objectives including how the program's various constituencies are involved in this process. Include the results of this process and provide a description of any changes that were made to the program educational objectives and the timeline associated with those changes since the last general review.

The MET faculty reviews the program educational objectives in collaboration with the Industrial Advisory Committee (IAC) before any proposed changes are implemented.

The program educational objectives are reviewed annually and revised after approval by members of the IAC. The membership of the IAC represents the broadest possible range of MET constituencies.

The existing program educational objectives were approved by the IAC in 2008 and represent a refined formulation of those in-force during the 2005 ABET general review. The program educational objectives are reviewed by the IAC during the annual October meeting (s. meeting minutes on the enclosed CD with the heading "Program Educational Objectives"). To date, the IAC has retained the objectives adopted in 2008. The process for revision of these is also documented in Table 4.2.

CRITERION 3. STUDENT OUTCOMES

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

Describe the process used for establishing and revising student outcomes.

From 2006 until 2008, baseline MET student outcomes consisted of erstwhile ABET Criterion 2a-k and Criterion 8 (program specific) outcomes from the 2005 ABET general review. Current outcomes include those of ABET Criterion 3a-k and Criterion 9a-e, both of contemporary vintage (2011-2012). Together these comprise a comprehensive set of outcomes that enable the status of the continuous improvement process to be benchmarked annually.

Student outcomes are reviewed by the MET faculty and presented to the Industrial Advisory Committee (IAC) for reevaluation and approval of any proposed revisions. Student outcomes are reevaluated annually during the October IAC meeting and revised as needed following IAC approval (s. meeting minutes on the enclosed CD with the heading "Student Outcomes"). By both intent and in practice, the IAC membership reflects the wide range of recognized program constituencies.

Current student outcomes were approved by the IAC in 2008 and represent modifications to those presented in the 2005 ABET general review. To date, the IAC has left the student outcomes adopted in 2008 unchanged. The process for revision of the student outcomes is summarized in Table 4.2.

As compared to Criterion 3 a-k, Criterion 9a-e outcomes are typically more specific and focused toward development of student skills aimed directly at meeting the constituent needs that drive program educational objectives. The latter outcomes are demonstrated by the student and primarily measured by the program at the time of graduation. They thus represent a foundational set of knowledge and skills designed to help facilitate achievement of the program educational objectives.

B. Student Outcomes

List the student outcomes for the program and describe their mapping to those in Criterion 3 and any applicable program criteria. Indicate where the student outcomes are documented.

ABET Criterion 3

3a. an ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline to broadly-defined engineering technology activities;

3b. an ability to select and apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require the application of principles and applied procedures or methodologies;

3c. an ability to conduct standard tests and measurements; to conduct, analyze, and interpret experiments; and to apply experimental results to improve processes;

3d. an ability to design systems, components, or processes for broadly-defined engineering technology problems appropriate to program educational objectives;

3e. an ability to function effectively as a member or leader on a technical team;

3f. an ability to identify, analyze, and solve broadly-defined engineering technology problems;

3g. an ability to apply written, oral, and graphical communication in both technical and nontechnical environments; and an ability to identify and use appropriate technical literature;

3h. an understanding of the need for and an ability to engage in self-directed continuing professional development;

3i. an understanding of and a commitment to address professional and ethical responsibilities including a respect for diversity;

3j. a knowledge of the impact of engineering technology solutions in a societal and global context; and

3k. a commitment to quality, timeliness, and continuous improvement.

NMSU MET (ABET Criterion 9)

An ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline; to include:

9a Algebra, trigonometry, Boolean mathematics, calculus, statistics and probability, fundamental principles and concepts of science and engineering technology, good practice in problem solving, and methods of standard practice in the analysis and applied design of mechanical systems.
(also ABET 3a, 3b, and 3d)

9b Fundamental aspects of AC and DC circuits, electrical components, computer programming logic, instrumentation principles, experimental techniques, methods of standard practice in the testing and evaluation of mechanical systems, safety consciousness, critical thinking skills, and codes and standards.
(also ABET 3a, 3b, and 3c)

9c Basic knowledge of manufacturing processes, engineering materials and their selection, measuring tools, machine tools, quality systems and processes, process improvement methods, economic principles, cost analysis techniques, and project management, relevant to mechanical technology areas.
(also ABET 3a, 3b, and 3d)

9d Current software corresponding to good practice in the application of mechanical engineering technologies. Software application functions to include: word processing, spreadsheet calculations, graphing, presentation media, computer assisted drafting and manufacturing, manufacturing processes, statistics, data acquisition, project management, and the analysis and applied design of systems involving mechanisms, machines, or fluid and thermal processes.
(also ABET 3a)

And, with respect to validation that graduates have been prepared for careers in their discipline, or postgraduate academic study in the discipline or a related one:

9e Graduates will receive offers for employment positions, commensurate with the level of a Bachelor's degree in technology, or be accepted into a Master's degree program for which the degree constitutes a prerequisite.

All student outcomes are listed and mapped under Criterion 3. All applicable program criteria are also included under Criterion 3.

The MET student outcomes may be viewed by the general public at:

http://etse.nmsu.edu/accreditation/outcomes_met.html

C. Relationship of Student Outcomes to Program Educational Objectives

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

The selection, revision, and focus of student outcomes are all driven by the needs of the MET Program's constituencies and the missions of the institution and department. Constituency input representing their needs is reflected in essential aspects of both student outcomes and program educational objectives. By having been created and continuously updated to address these needs, student outcomes are oriented toward helping to ensure the achievement of program educational objectives. Additionally, the

achievement of student outcomes is recognized as an indispensible prerequisite toward attaining program educational objectives, within the overall outcomes assessment process.

The emphasis of MET student outcomes is specifically defined and demonstrated by the particular combination of fundamental engineering principles, modern tools of the discipline, and relevant skills that have been selected as being essential for a graduate's successful professional development in industry, consulting, or government. Student mastery of the topic principles, tools, and skills constitutes the essence of achieving student outcomes and lays the foundation upon which graduates build, as they develop competence in a technical specialty area, or in the management of technical personnel, following 2-5 years of employment in a field-related technical area. The professional development and demonstration of competency are two primary program educational objectives.

Also underlying the formulation and revision of student outcomes and program educational objectives is the goal of preparing graduates to better compete in a changing world.

CRITERION 4. CONTINUOUS IMPROVEMENT

The ABET assessment and evaluation process, as illustrated in the flowchart format of Fig. 4.1, is employed for the continuous improvement process.

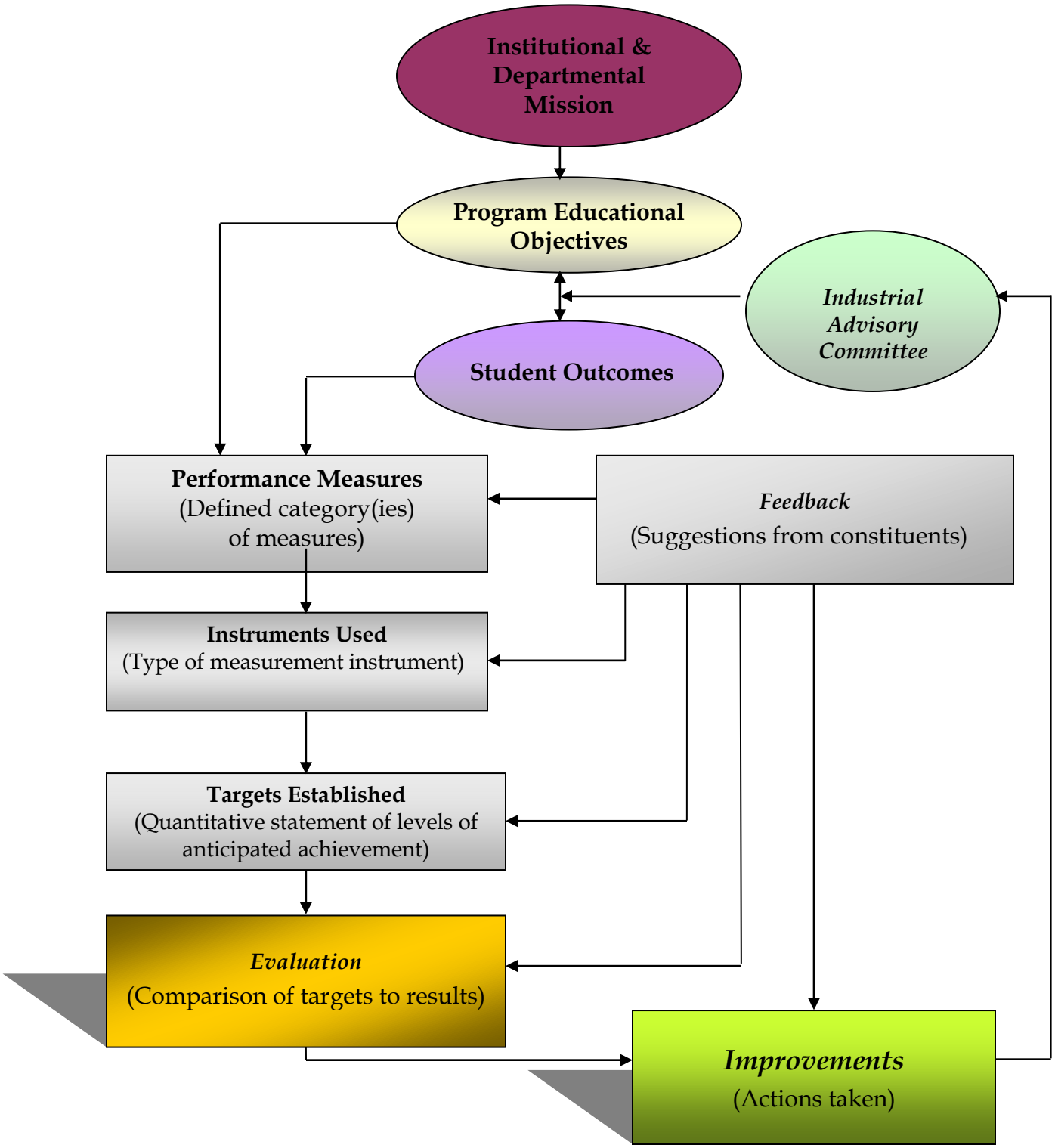


Figure 4.1: The ABET continuous improvement process represented in flowchart format. The program educational objectives and the student outcomes of Fig. 4.1 are specified under section headings Criterion 2 and Criterion 3, respectively.

A. Program Educational Objectives

It is recommended that this section include (a table may be used to present this information):

1. A listing and description of the assessment processes used to gather the data upon which the evaluation of each the program educational objective is based. Examples of data collection processes may include, but are not limited to, employer surveys, graduate surveys, focus groups, industrial advisory committee meetings, or other processes that are relevant and appropriate to the program.
2. The frequency with which these assessment processes are carried out
3. The expected level of attainment for each of the program educational objectives
4. Summaries of the results of the evaluation processes and an analysis illustrating the extent to which each of the program educational objectives is being attained
5. How the results are documented and maintained

Each program educational objective is measured by one specific instrument which is an alumni survey conducted annually. The following information is collected to provide sufficient data to assess the program educational objectives.

1. Employer, two and five years after graduation, respectively
2. Position title, two and five years after graduation, respectively
3. Whether:

A. the baccalaureate degree curriculum of the Mechanical Option in Engineering Technology at New Mexico State University prepared the graduate with the knowledge base, problem solving abilities, and practical skills of mechanical aptitude necessary to enter a professional career that involved the design, installation, manufacture, testing, evaluation, technical sales, or maintenance of mechanical systems, encountered in industry, consulting, or government.

B. the ET M curriculum prepared the graduate to analyze, perform applied design, develop, implement, or oversee advanced mechanical systems and processes.

C. the ET M curriculum laid a foundation for the graduate to demonstrate competence in a technical specialty area, or in the management of technical personnel, following 2-5 years of employment in a field-related area.

D. the graduate was prepared to compete in a changing world.

These data are gathered by the department staff and discussed among ET M faculty members to evaluate the achievement of program educational objectives. Summaries of the results and the evaluation are shared with the IAC in October, where follow-on discussions take place. This represents the final forum to approve implementation of any

changes to the curriculum, to student outcomes, or to program educational objectives. The IAC agenda and meeting minutes document all such changes.

The ET M program has closed the loop on this process for ___ cycles. The survey data and meeting minutes are on the enclosed CD with the heading "Program Educational Objectives". Table 4.1 illustrates the Assessment Activities and Timeline.

Table 4.1: Graduate survey for ET M Program.

NMSU ET M Program Graduate Survey

1. Please fill in the three following blank lines.

	Employer Name	**Position Title**
____ years after graduation:	_____	_____

2. In the context of you being a graduate of the baccalaureate degree curriculum of the Mechanical
Option in Engineering Technology at New Mexico State University, please indicate an answer of *Yes*, or *No* to the following four questions. Did the curriculum

A. provide you with the knowledge base, problem solving abilities, and practical skills of mechanical aptitude necessary to enter a professional career that involved the design, installation, manufacture, testing, evaluation, technical sales, or maintenance of mechanical systems, encountered in industry, consulting, or government?

Yes or *No*

B. prepare you to develop an ability to analyze, perform applied design, develop, implement, or oversee advanced mechanical systems and processes?

Yes or *No*

C. lay a foundation that enabled you to demonstrate competence in a technical specialty area, or in the management of technical personnel, following 2-5 years of employment in a field-related area?

Yes or *No*

D. prepare you to compete in a changing world?

Yes or *No*

3. *Optional:* Please provide any comments that would assist the ET M Program in better preparing graduates for career success in professional arenas of technology and engineering, or for success in graduate school.

Table 4.2: MET Assessment Activities and Timelines

Six Performance Measures

Assessment Activity	How Often	Collection Date	Responsible	Complete
Performance in specific components of student work	Once Annually	December, May	Instructor of specific work	May
Student Portfolios	Twice Annually	May, December	Instructor for ET 435	May, January
Senior Competency Exam	Twice Annually	May, December	Faculty	May, January
Performance in Capstone Course	Twice Annually	May, December	Instructor for ET 435	End of Fall and Spring semesters
Initial Placement of Graduates	Fall, Spring and Summer	End of Semester or Summer Session	Coordinator	End of Semester or Summer Session
Fundamentals Exam	Twice Annually	April, October	Coordinator	End of Fall and Spring semesters
Present Findings to IAC, Review and Update • Program Objectives • Program Outcomes • Above measures	Once Annually	Fall	MET Faculty and Advisory Board members	Fall
Industrial Advisory Committee (IAC) Minutes	Once Annually	October	Coordinator	November
Survey of Alumni Employment Affiliation and Position Title for Educational Objectives	Annually	Summers	Coordinator	Fall

Student Outcomes

It is recommended that this section include (a table may be used to present this information):

1. A listing and description of the assessment processes used to gather the data upon which the evaluation of each student outcome is based. Examples of data collection processes may include, but are not limited to, specific exam questions, student portfolios, internally developed assessment exams, senior project presentations,

nationally-normed exams, oral exams, focus groups, industrial advisory committee meetings, or other processes that are relevant and appropriate to the program.
2. The frequency with which these assessment processes are carried out
3. The expected level of attainment for each of the student outcomes
4. Summaries of the results of the evaluation process and an analysis illustrating the extent to which each of the student outcomes is being attained
5. How the results are documented and maintained

Each outcome from Criterion 3a-k and Criterion 9a-e is assessed by two or more broad measures. Each measure contains specific instruments used to conduct the appropriate assessment in order to evaluate the breadth and depth of student learning and program applicability. The MET program uses six measures:

1. Performance in specific components of student work in select individual courses
2. Student portfolios submitted during the student's final semester
3. Results of the Senior Competency Exam
4. Performance in the capstone design and project management course
5. Initial placement of graduates
6. Results of the Fundamentals of Engineering Exam

A description of these measures is as follows.

1. Senior capstone course in design and project management
   The senior capstone course is used as assessment tool for the MET option, ET 435 (Senior Design and Project Management). **Instruments used** for this measure include the planning, management, and completion of a technical project, project presentations and reports, demonstrated teamwork. Course Assessment Records represent the documentation format for this data.

2. Performance in specific components of student work
   This measure includes evaluation of student work within specific categories - as obtained from several courses - toward measuring an outcome. For example, the lab component from several courses is used to measure outcome 3c and 9b (laboratory testing), outcome 3e (teamwork), outcome 3g (communication) and 9d (software applications).
   Instruments applied are course quiz and exam questions, problems and exercises, oral presentations, written communication scores on reports, projects, and pre-laboratory and laboratory exercises, and concept worksheets. Course Assessment Records constitute the documentation format for this data.

3. Fundamentals of Engineering Exam
   This standardized exam is used to measure those outcomes dealing with basic knowledge, fundamental principles of engineering, skills, and analysis. MET students are compared to their peers for relevant topics covered on the exam. The nationally-normed questions of the Fundamentals of Engineering Exam compiled by the NCEES serve as the **instrument employed**.

4. Senior competency exam

   The MET Senior Competency Exam covers relevant topics presented in courses classes up through the senior year. The exam is primarily conceptual with calculations needed on some 20% of the problems. Specific questions on the exam represent the **applied instrument**.

Table 4.3: MET Mapping of Student Outcomes (Criteria 9 and 3) to Measures.

Outcome	Measure (1-6)
9a, 3a, 3b, 3d	1,2,4
9b, 3a, 3b, 3c	1,3,4
9c, 3a, 3b, 3d	1,3,4
9d, 3a	1,2,4
9e	5
3e	1,4
3f	1,4
3g	1,2,4
3h	1,4
3i	1,4,6
3j	1,4
3k	1,4

Measure No. 1 involves many of the upper division courses. Table 4.3 summarizes which courses contribute to outcomes. The shaded boxes are the courses that are assessed formally as outcomes instruments. These relationships are more specifically illustrated in course syllabi, where course objectives are linked to student outcomes. These syllabi may be accessed on line before the Fall visit. An example of how Criterion 3 is mapped to ET 308L is shown in Tables 4.4 and 4.5 below. Course Assessment Records developed for core MET courses are also used as assessment instruments. Refer to the enclosed CD for this data.

Table 4.4: Matrix of MET Core Courses and Student Outcomes: ABET (3a-3k) and MET (9a-9e) **.**

	ABET											**MET**				
Course	**3**a	b	c	d	e	f	g	h	i	j	k	**9**a	b	c	d	e
ET 110	x											x			x	
ET 210	x			x								x			x	
ET 217	x	x										x				
ET 217/L	x	x						x				x		x		
ET 240	x	x														
ET 241	x	x										x				
ET 262(L)	x	x											x			
ET 302	x	x	x									x		x	x	
ET 306	x	x	x	x	x	x						x				
ET 306/L			x		x		x		x		x		x		x	
ET 308	x	x	x	x		x						x				
ET 308/L			x		x		x		x		x		x		x	
ET 310/L	x	x	x									x			x	
ET 328/(L)	x	x				x							x		x	
ET 396/(L)	x	x	x	x	x	x	x					x			x	
ET 410								x	x	x	x					
ET 422/(L)	x	x	x		x	x							x		x	
ET 426/(L)	x	x				x						x			x	
ET 435	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

Table 4.5: Example of typical course assessment matrix.

ET 308L course assessment matrix.

Outcome-related learning objectives	Outcome 1	Outcome 2	Outcome 3	Outcome 4	Outcome 5	Outcome 6	Outcome 7	Outcome 8	Outcome 9	Outcome 10
- apply fundamental principles and concepts and methods of standard practice relevant to the testing and evaluation of fluid-technology related systems	3									
- formulate a plan of action and select applicable instrumentation toward accomplishing the objective of an experiment										
- identify underlying fundamental principles, simplifying assumptions, and constraints (cost, time, equipment) relevant to an experiment	3									
- function effectively on a team		2								
- effectively communicate orally, in writing, and graphically			3							
- identify an ethical dilemma in professional practice; recommend and justify a resolution				3						
- identify prospective safety hazards in a lab environment and recommend viable mitigation measures						1				
- draw relevant conclusions based upon experimental results	3		2			3				
- demonstrate the application of a code or standard as an integral initial step in standard practice of test and evaluation					1					
- analyze liquid flows in pipelines and open channels and select pump using software tools							3			

degrees to which objective addresses outcome: 1 = slightly, 2 = moderately, 3 = substantively

Outcome 1 (ABET 3c): ability to conduct standard tests and measurements; to conduct, analyze; and to apply experimental results toward improving processes.

Outcome 2 (ABET 3e): ability to function effectively as a member or leader on a technical team.

Outcome 3 (ABET 3g): an ability to apply written, oral, and graphical communication in both technical and nontechnical environments.

Outcome 4 (ABET 3i): an understanding of and a commitment to address professional and ethical responsibilities.

Outcome 5 (ABET 3k): a commitment to quality, timeliness, and continuous improvement.

Outcome 6 (MET 9b): ability to select and apply fundamental aspects of instrumentation principles; experimental techniques, methods of standard practice in the testing and evaluation of mechanical systems; safety consciousness; and critical thinking skills.

Outcome 7 (MET 9d): ability to apply software applications for text documents, spreadsheet calculations, graphs, and fluid processes.

Table 4.6: Example of typical course assessment report.

ET 308L – FLUID TECHNOLOGY LABORATORY – CRITERION 3 Course Assessment Report		
No.	Crit.	
1	3c	an ability to conduct standard tests and measurements; to conduct, analyze, and interpret experiments; and to apply experimental results toward improving processes. (specifically - an ability to follow test procedures, identify advantages and disadvantages of a test method, evaluate the quality of test results, and draw useful conclusions from test results.)
2	3e	an ability to function effectively as a member or leader on a technical team. (specifically - an ability to demonstrate: cooperation, a willingness to accept direction, and initiative in a group educational laboratory setting.)
3	3g	an ability to apply written, oral, and graphical communication in both technical and nontechnical environments. (specifically - an ability to demonstrate good practice in the generation of written laboratory reports and technical graphs and in the formulation of introductory sentences.)
4	3i	an understanding of and a commitment to address professional and ethical responsibilities. (specifically - an understanding of academic ethics as a model for professional ethics.)
5	3k	a commitment to quality, timeliness, and continuous improvement. (specifically - an ability to submit out-of-lab assignments punctually.)
Measurements and Instrument Targets: Percentage of students who will achieve the following: c. 70 % of the students will demonstrate a score of ≥4/5 for each of lab report sections: *Results, Comparison of Results, Advantages/Disadvantages, and Conclusions*. e. 80% of the students will score ≥ 9/10 *on teamwork* g. 80% will score ≥ 8/10 *on laboratory reports, on Introduction* section, and on *graphing assignments* i. 90% of the students will score ≥ 9/10 on ethics-related *concept worksheets* k. 90% of the students will submit prelab exercises and lab reports punctually.		

Evaluation and Continuous Improvement Recommendations:	
c. 72% of the students scored ≥ 4/5 on relevant lab report sections. e. 86% of the students scored ≥ 9/10 on *teamwork.* g. 82% of the students scored ≥ 8/10 *on laboratory reports,* 73% of the students scored ≥ 8/10 *on Introduction*, and 84% of the students scored ≥ 8/10 on *graphing assignments.* i. 90% of the students scored ≥ 9/10 on ethics-related *concept worksheets*. k. 90% of the students submitted prelab exercises and lab reports punctually. All assessment criteria but one were met. More emphasis will be placed on the importance of introductory sentences in technical and nontechnical reports. No other improvements are foreseen at this time.	
Date: August, 2008	Instructor: C. Ricketts

B. Continuous Improvement

Describe how the results of evaluation processes for the program educational objectives and the student outcomes and any other available information have been used as input in the continuous improvement of the program. Indicate any significant future program improvement plans based upon recent evaluations. Provide a brief rationale for each of these planned changes.

Each program educational objective and student outcome is assessed and evaluated individually, and has a graphical flowchart similar in format to that in Fig. 4.1. The flowcharts are presented in the Appendix and are on the CD under the headings "Program Educational Objectives" and "Student Outcomes". Specific measures, targets, evaluations, and improvements are depicted for each objective and outcome. Data from each measure (from specific instruments used in that measure category) are collected for each objective and outcome according to the *MET Assessment Activities and Timeline* of Table 4.2.

Evaluation of the data from the measures occurs per the *MET Assessment Activities and Timeline* of Table 4.2. A comprehensive evaluation is conducted annually in August by the MET faculty. During this meeting, data for each outcome and objective are presented for discussion. The MET faculty discusses each outcome and objective individually, to determine whether the outcome or objective is being fulfilled.

Improvement processes are adopted based on the evaluation of all measures for that outcome. When the process works correctly, improvements needed are easily identified. Improvements may benefit a topic, lab, class, several classes, or several labs. The improvements are directly related to the overall goal of achieving objectives and outcomes. While cycles typically result in improvement activities, some evaluations are favorable and no improvements are considered to be necessary at that time.

The 2006-2007 cycle evaluation uncovered the following:

Outcomes 3a (9d) and 3d were not fully met. Acceptable CAD skills were lacking in ET 305 students as determined by the course instructor.

- To address both outcomes, a second CAD course (ET 210), *Computer-Aided Design*, was added to the curriculum and implemented as a Spring offering in 2008.

- To address Outcome 3a, the technical elective *Manufacturing Data Analysis* (ET 302), was converted into a required course as a replacement for *Statistical Applications* (E ST 311) and *Quality in Manufacturing* (ET 404), former required courses in the curriculum. ET 302 was implemented as in Fall 2007 as a twice per annum offering.

- To address both outcomes, *Manufacturing Processes* (ET 217/L) was changed from a 2+3P course with a lab component to a 3-credit-hour lecture course with a separate 3P *Manufacturing Processes Laboratory* (ET 217L). These curriculum modifications replaced the 2-credit-hour *Introduction to Materials* (ET 117/L) while maintaining the topic of materials within the curriculum.

Other changes during this cycle:

- As the first in a palette of planned technical electives to be offered in the renewable energy technology area, *Renewable Energy Technologies* (ET 381) was added as a technical elective to the ET M curriculum.

The 2007-2008 cycle evaluation uncovered the following:

Outcome 3a (9d) was not fully met. Acceptable fundamental CAD skills were lacking in ET 210 students.

- A new instructor was assigned to ET 110 for Fall 2008 and closer collaboration initiated between ET 110 and ET 210 instructors.

Other changes during this cycle:

- An Emphasis in *Renewable Energy Technologies* was added to the options available to ET M students.

- To facilitate a planned Concentration in the renewable energy technology area, the technical elective (ET 365), *Building Utilities*, was converted into an optional required course/technical elective paired with *Renewable Energy Technologies* (ET 381). This course-pair requirement replaced *Safety Systems and Programs* (ET 361) which was discontinued as a required course in the ET M curriculum. The discontinuation was an administrative decision made at the departmental level based upon resource constraints.

- To augment the set of technical electives in the renewable energy technology area, *Solar Energy Technologies* (ET 382) and *Wind Energy Technologies* (ET 384) were added as technical electives to the ET M curriculum.

- To address recurring IAC recommendations for an instrumentation course more oriented toward ET M students, plans were laid to develop *Mechanical Measurements* (ET 422) toward replacing *Instrumentation* (ET 402) as an option for ET M students.

- *Mechanical Measurements* (ET 422) was offered for the first time during the Spring 2008 semester.

The 2008-2009 cycle evaluation uncovered the following:

Outcome 3g was not fully met. Acceptable oral presentation skills were lacking in ET 435 midterm and final presentations.

- Oral presentation guidelines were revised in ET 306L and ET 435. Also more emphasis was placed upon the importance of oral communication skills in both courses.

Outcome 9c was not fully met. Basic knowledge of quality processes (statistics) was not demonstrated in ET 435 project work.

- Coordination was implemented with ET 302 instructor.

Outcome 3e was not fully met. Good practice in teamwork was lacking in ET 435 project execution. This could be attributed to dysfunctional team dynamics of two members of a team of three.

- A new guideline was implemented to avoid placing marginal students who are close friends on the same project team.

Other changes during this cycle:

- A Minor in *Renewable Energy Technologies* was added to the options available to ET M students.

- The Emphasis in *Renewable Energy Technologies* was replaced by a more rigorous Concentration in *Renewable Energy Technologies*.

- To augment the set of technical electives in the renewable energy technology area, *Sustainable Construction and Green Building Design* (ET 386) was added as a technical elective to the ET M curriculum.

- To broaden the topics addressed within the set of technical electives in the renewable energy technology area, water energy content was incorporated into *Wind Energy Technologies* (ET 384).

- *Mechanical Measurements* (ET 422) was not offered during the Spring 2009 semester due to a lack of faculty resources.

The 2009-2010 cycle evaluation uncovered the following:

Outcome 9c was not being suitably addressed in the quality processes (statistics) area, as indicated by feedback from student members of the IAC.

- A new instructor was assigned to ET 302 beginning Fall 2010.

The average score on the Senior Competency Exam fell below the minimum value for both the Fall 2009 and the Spring 2010 semesters. The low scores were found to be in the following areas: .

Outcomes 3a and 3d were not fully met.

Other changes during this cycle:

- Improved instruments for the continuous improvement processes were put in place. …
- *Mechanical Measurements* (ET 422) was not offered during the Spring 2010 semester due to a lack of faculty resources.

The 2010-2011 cycle evaluation will show in August 2011 that (among others) the following was uncovered:

Insufficient laboratory time was limiting student progress and outcomes in ET 110 as determined by the course instructor.

- The course format of ET 110 was changed from 3 credit hours to one of 2+3P to replace a 50-min lab session with one of 150 minutes.

Other changes during this cycle:

- Put in place an improved instrument for the continuous improvement processes in the form of a revised Senior Competency Exam.
- *Mechanical Measurements* (ET 422) was offered for the second time, during the Spring 2010 semester.

C. Additional Information

Copies of any of the assessment instruments or materials referenced in 4.A, 4.B, or 4.C must be available for review at the time of the visit. Other information such as minutes from meetings where the assessment results were evaluated and where recommendations for action were made could also be included.

During the Fall site visit by ABET evaluators, separate notebook binders will be provided for each program educational objective and student outcome, in our display room. Each notebook has a summary sheet indicating the measures, instruments, targets, evaluations, and improvements (closed loop) for that objective and outcome. The notebooks and display materials will be labeled for ease in cross referencing. Also refer to the enclosed CD for this information, under the headings "Program Educational Objectives", Student Outcomes", and "Continuous Improvement".

During the site visit, the MET program will also make available the following items for review:

1. Examples of student work (homework, exams, project reports, lab reports, video tapes of oral presentations, etc.),
2. Course syllabi, and
3. Course textbooks.

CRITERION 5. CURRICULUM

A. Program Curriculum

1. Complete Table 5-1 that describes the plan of study for students in this program including information on course offerings in the form of a recommended schedule by year and term along with average section enrollments for all courses in the program over the two years immediately preceding the visit. State whether you are on quarters or semesters and complete a separate table for each option in the program.
2. Describe how the curriculum aligns with the program educational objectives.
3. Describe how the curriculum and its associated prerequisite structure support the attainment of the student outcomes.
4. Attach a flowchart or worksheet that illustrates the prerequisite structure of the program's required courses.
5. For each curricular area specifically addressed by either the general criteria or the program criteria as shown in Table 5-1, describe how your program meets the specific requirements for this program area in terms of hours and depth of study.
6. If your program has a capstone or other culminating experience for students specifically addressed by either the general or program criteria, describe how this experience helps students attain the student outcomes.
7. If your program allows cooperative education to satisfy curricular requirements specifically addressed by either the general or program criteria, describe the academic component of this experience and how it is evaluated by the faculty.
8. Describe by example how the evaluation team will be able to relate the display materials, i.e. course syllabi, textbooks, sample student work, etc., to each student outcome. (See the 2011-2012 APPM section II.G.6.b.(2) regarding display materials.)

Table 5-1 Curriculum

Bachelor of Science in Engineering Technology- Mechanical Engineering Technology

Course (Department, Number, Title) List all courses in the program by term starting with first term of first year and ending with the last term of the final year.	Indicate Whether Course is Required, Elective, or a Selective Elective by an R, an E or an SE[2]	*Curricular Area (Credit Hours)*				Last Two Terms the Course was Offered: Year and, Semester, or Quarter	Average Section Enrollment for the Last Two Terms the Course was Offered[1]
		Math & Basic Sciences	Discipline Specific Topics	General Education	Other		
Freshman Year (34 credits)							
E T 101, Introduction to Engineering Technology	R		*1*			*Fall 2010*	*58 - Fall 2010*
ET 110, Introduction to Computer-Aided Drafting and Design	R		*3*			*Fa 2010 /*	*30-Fall 2010*
E T 120, Computation and Presentation Software	R		*3*			*Fa 2010 / Sp 2011*	*45 (2 sections) 22-Spring 2011*
E T 182 ,Digital Logic	R		*3*			*Fa 2010 Sp 2011*	*62 – (2 sections) 32-Spring 2011*
E T 190, Applied Circuits	R		*3*			*Fa 2010 Sp 2011*	*21 - Fa 2010 23-Spring 2011*
ET 191, Applied Circuits Laboratory	R		*1*			*Fa 2010 Sp 2011*	*14 – Fa 2010 25-Spring 2011*
ET 210, Computer-Aided Design	R		*2*			*Sp 2011*	*28-Spring 2011*
MATH 190G, Trigonometry and Precalculus	R	*4*				*Fa 2010 / Sp 2011*	*354 (9 sections) 266(7 sections)*
PHYS 211G-211GL, General Physics I	R	*3*				*Fa 2010 / Sp 2011*	*140 (2 sections) 107*
PHYS 211G-211GL, General Physics Lab 1		*1*				*Fa 2010 /*	*141 (7 labsections)*

						Sp 2011	*109 (6 sections)*
CHEM 110 G, Principles and Applications of Chemistry (7 sections)	R	*4*				*Fa 2010 / Sp 2011*	*438 – Fa 2010 328-Spring 2011*
General Education Core Course from Area I: Level 1 Composition	SE			*4*		*Fa 2010 / Sp 2011*	*not available*
General Education Core Courses from Area V	SE			*3*		*Fa 2010 / Sp 2011*	*not available*
Sophomore Year (34 credits)							
ET 217			*3*			*Sp 2011*	*28-Spring 2011*
ET 217L			*1*			*Sp 2011*	*21-Spring 2011*
E T 240, Applied Statics	R		*3*				*22 – Fall 2010 17- Spring 2011*
ET 262, Software Technology I	R		*3*			*Fa 2010 Sp 2011*	*31 – Fa 2010 27-Spring 2011*
E T 308, Fluid Technology	R		*3*			*Fa 2010*	*17 – Fall 2010 19-Spring 2011*
E T 308 L, Fluid Technology Lab	R		*3*			*Fa 2010*	*20 – Fall 2010 16-Spring 2011*
E T 310, Applied Strength of Materials	R		*3*			*Fa 2010*	*14 – Fall 2010 25 – Spring 2011*
ET 310, Applied Strength of Materials Lab	R		*1*			*Fa 2010*	*11 – Fall 2010 15-Spring 2011*
MATH 235, Calculus for the Technical Student I	R	*6*				*Fa 2010 / Sp 2011*	*41 – Fall 2010 ?*
PHYS 212, General Physics II	R	*3*				*Fa 2010 / Sp 2011*	*74-Fall 2010 51–Spring 2011*
PHYS 212G-212GL, General Physics Lab 1						*Fa 2010 Sp 2011*	*68 – Fa 2010 85-Spring 2011*
General Education Core Course from Area I: Oral	SE			*3*		*Fa 2010 /*	*not available*

Communication						*Sp 2011*	
General Education Core Course from Area I: Level 2 Composition	SE			*3*		*Fa 2010 / Sp 2011*	*not available*
General Education Core Course from Area IV: ECON251G or ECON 252G	SE			*3*		*Fa 2010 / Sp 2011*	*not available*
Junior Year (31 credits)							
E T 241, Applied Dynamics	R		*3*			*Fa 2010*	*51 – Fall 2010*
E T 302, Manufacturing Data Analysis	R		*3*			*Fa 2010 / Sp 2011*	*29 – Fall 2010 16-Spring 2011*
E T 306, Fundamental and Applied Thermodynamics	R		*3*			*Fall 2010*	*24 – Fall 2010*
ET 306L, Thermodynamics Laboratory	R		*1*			*Fall 2010*	*26 – Fall 2010*
ET 328, Kinematics of Machines	R		*3*			*Sp 2011*	*24-Spring 2011*
ET 365, Building Utilities or			*3*			*Not taught*	*Not taught*
ET 381, Renewable Energy Technologies	R					*Sp 2011*	*29-Spring 2011*
ET 396, Heat Transfer and Applications	R		*3*			*Sp 2011*	*18-Spring 2011*
MATH 236, Calculus for the Technical Student II						*Fa 2010 / Sp 2011*	*24 – Fall 2010 35-Spring 2011*
Approved Technical Elective			*3*				
General Education Core course from Area IV	SE			*3*		*Fa 2010 / Sp 2011*	*Not available*
General Education Core course from Area V	SE			*3*		*Fa 2010 / Sp 2011*	*Not available*
Senior Year (31 credits)							
C E 450, Engineering Economy and Law, or BLAW 316, Legal Environment of Business, or BLAW 325, Real Estate Principles and Law I	R		*3*			*Fa 2010 / Sp 2011*	*34 – Fall 2010 21-Spring 2011*
E T 410, Senior Seminar	R		*1*			*Fa 2010 / Sp 2011*	*30 – Fall 2010 24-Spring 2011*
E T 422, Mechanical Measurements; or	R		*3*			*Sp 2011*	

ET 402, Instrumentation			*3*			*Fa 2010*	*12 – Fa 2011* *13-Spring 2011*
ET 426, Analysis/Design of Machine Elements	R		*3*			*Fa 2010*	*20 -Fa 2010*
ET 435, Senior Design and Project Management	R		*3*			*Fa 2010* *Sp 2011*	*8-Fa2010*
General Education Core course from Area IV or Area V	R		*4*				*16 – Fall 2010*
Two approved Technical Electives	SE		*6*				*not available*
Approved upper division elective in management, business, marketing, or math	SE		*3*				*not available*
Viewing a Wider World, General Education Management	SE		*3*			*Fa 2010 / Sp 2011*	*not available*
Add rows as needed to show all courses in the curriculum.							
OVERALL TOTAL CREDIT HOURS FOR THE DEGREE	130						
PERCENT OF TOTAL							

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

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

In addition to the required course program of classes, the students have the option to pursue

CONCENTRATION: Renewable Energy Technologies

Students can fulfill the Renewable Energy Concentration requirements by substituting the classes below for the three technical electives.

E T 381, Renewable Energy Technologies

E T 386, Sustainable Construction and Green Building Design

E T 382, Solar Energy Technologies or E T 384, Wind and Water Energy Technologies

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

The curriculum is specifically designed to provide students with the abilities and skills to be productive in the workplace, beginning with entry-level employment upon graduation. Assessment results indicate that program educational objectives continue to be met by graduates, following 2-5 years of relevant experience on the job. This leads to the conclusion that the curriculum is providing the requisite basis to help ensure that current program educational objectives are being achieved. Please see also Criterion 3 Part C above.

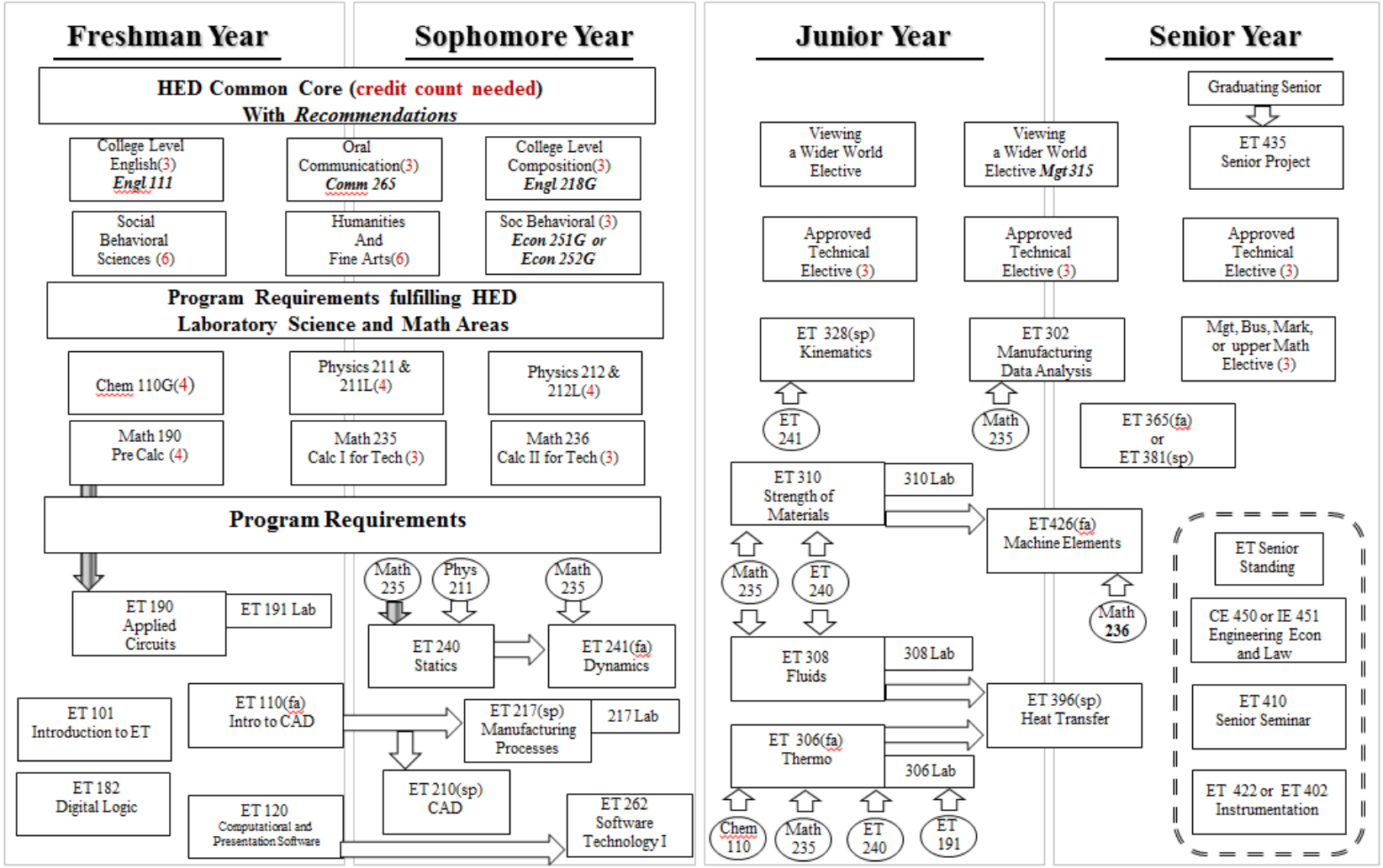
3. Describe how the curriculum and its associated prerequisite structure support the attainment of the student outcomes.

In order to achieve many student outcomes, paths of core courses having prerequisites become essential within an integrated, cumulative educational process. Please refer to the prerequisite flow chart below showing, for example, sequences starting with Math 190 and PHYS 211 and ending with ET 328 and ET 396. The courses in these sequences are designed to build logically upon each other, leading to the student attaining the status of senior and eventually that of graduating senior. This, in turn is a prerequisite to the culminating (capstone) senior design and project management course where many outcomes are assessed.

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

Catalog 2010-2011: Bachelor of Science Engineering Technology

Major: Mechanical Engineering Technology



fa - fall only course
sp - spring only course

Pre-requisite

Co / Pre-requisite

5. For each curricular area specifically addressed by either the general criteria or the program criteria as shown in Table 5-1, describe how your program meets the specific requirements for this program area in terms of hours and depth of study.

The technical content meets the distribution given in Criterion 5, at 60% distribution. Criterion 5 does not require specific distribution requirements for communications, mathematics, Physical and Natural Sciences or Social Sciences and Humanities. However, our institution does require a minimum number of credits that "Develop Critical Thinking and Modes of Expression". These are reflected in Table 5-1.

Communications

Students are required to complete courses in composition and rhetoric, technical writing, and oral communications. Students enrolled in laboratory courses are typically required to submit written reports and to interact verbally with the instructor and their peers. Written reports are graded on technical content, presentation, format, grammar, and spelling. Most upper-level courses incorporate some form of written communication requirements which are documented in course syllabi. Specific examples include concept questions in homework assignments, essay questions on final exams, and three oral presentations in the capstone design.

Mathematics

Unless they score sufficiently high on the ACT or SAT or local Math Placement Exam toward testing out of them, students take a semester of pre-calculus which includes trigonometry. Students complete one semester of applied differential calculus and a second course in applied integral calculus. When it is useful to demonstrate appropriate use, calculus is used in technical courses that have the calculus courses as prerequisites. Students who can foresee the possibility of pursuing a graduate degree in a technical area are encouraged to complete a course in differential equations toward fulfilling an elective requirement.

Physical and Natural Sciences

The basic science content includes physics and chemistry. Presently required are Chem 110G, basic chemistry, and PHYS 211&L and PHYS 212&L, noncalculus-based treatments of physics fundamentals. A laboratory component is required for the above courses.

Social Sciences and Humanities

Students are required to take a total of 21 credit hours of humanities and social science electives. The NMSU general education requirements specify that students of all majors select courses that inherently expose them to diversity, and global and societal issues.

Technical Content Courses

A broad-based foundation in technical courses prepares ET M graduates for a variety of employment opportunities. Emphasis is placed on fundamentals of engineering and technology. Most technical courses ensure that students develop both practical problem solving and critical thinking skills. This background enables graduates to find employment across a wide spectrum of areas within which graduates having technical backgrounds are sought.

Other

In addition to the specific ABET requirements, students are required to take two upper-division courses from the Business College, or one course from the Business College and one upper-division math course (typically differential equations, linear algebra, or statistics). These requirements provide technical students the benefit of additional preparation for eventual leadership roles in management during their careers, if not graduate school.

6. If your program has a capstone or other culminating experience for students specifically addressed by either the general or program criteria, describe how this experience helps students attain the student outcomes.

The capstone design course challenges the student - over the course of the project - to reflect back on prerequisite topics and apply cumulative knowledge, during a process that requires implementation of higher-level knowledge and skills directly related to student outcomes. Standard analysis techniques, design principles, as well as teamwork, communication, problem solving, and critical thinking skills represent some specific examples. In order to complete project requirements successfully, the student must demonstrate practical application of relevant knowledge and skills, thus reinforcing them during this phase of transition from the academic arena to gainful employment in the world of practice.

See also A. Part 3 and Criterion 4, Part B above.

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

Cooperative education experience does not currently fulfill any ET M curriculum requirements. However, due to the nature of this intrinsically practical, hands-on program, co-op work phases are strongly encouraged. Faculty members, the Assistant Dean's Office, and the Career Services Department work with both students and employers to help facilitate appropriate opportunities.

8. Describe by example how the evaluation team will be able to relate the display materials, i.e. course syllabi, textbooks, sample student work, etc., to each student outcome. (See the 2011-2012 APPM section II.G.6.b.(2) regarding display materials.)

Please see Criterion 4, Part D.

Display materials will include the following:

1) Notebooks for PEOs and Student Outcomes
2) Notebooks containing data from six measures
3) Notebook containing IAC agenda and minutes
4) Notebook containing PEO and SO evaluations by faculty members
5) Notebooks for each core course with evidence of student work
6) Textbooks for all courses in the program
7) Evidence of work from math and science courses
8) Evidence of communication skills using videos, student portfolios, and examples of student project work
9) Catalogs, brochures, other academic materials

A. Course Syllabi

In Appendix A, include a syllabus for each course used to satisfy the mathematics, science, and discipline-specific requirements required by Criterion 5 or any applicable program criteria. For required courses with multiple sections that do not use a common syllabus, please include a syllabus for each of the different sections.

Please see Appendix A.

B. Advisory Committee

Describe the composition of the program's advisory committee and show that it is representative of organizations being served by the program's graduates. Describe activities of the advisory committee and provide evidence that it is assisting the program to (1) review the curriculum and (2) maintain the validity of the program educational objectives.

The most recent roster of the Industrial Advisory Committee (2010/2011) is provided in Table 5-2. Of eighteen members, 16 are ET M program graduates, 13 of whom represent industry and three of whom represent two regional National Laboratories. The IAC membership includes members of professional societies such as ASME, SAE, SME, and ASHRAE. Changes in the roster over time are documented within annual IAC meeting minutes.

See also meeting minutes on the enclosed CD under the heading "IAC Members, Agenda, and Minutes".

The IAC meets annually to review the curriculum in the context of member needs and student outcomes (as described in Criterion 2. E), together with input from faculty and IAC student members. This process is illustrated in Table 4-1. Program educational objectives are evaluated in a similar manner with respect to alumni survey results. To date, the IAC has retained the objectives adopted in 2008. The process for revision of these is also illustrated in Table 4.2.

Table 5-2: ***2010/2011 Industrial Advisory Committee***

Members

Ms. Marlene Carrillo; *Jacobs Technology*
Ms. Crystal Enoch; *Enoch Mechanical*
Ms. Robby Forster; *Louisiana Energy Services*
Mr. Clint Hall; *Sandia National Laboratories*
Mr. Bernard (B.J.) Lackey; *General Motors*
Mr. Jessie Nichols; *Los Alamos Nat. Lab*.
Mr. Luke Nogales; *Proctor & Gamble Co.*
Mr. Michael Owen; *NTEC/WTSF*
Mr. Scott Pennington; *Louisiana Energy Services*
Mr. Mark Petrie; *TriAxis Engineering, Inc.*
Dr. Ed Pines; *NMSU*, IE
Mr. Edward Romero, *Sandia Nat. Laboratories*
Mr. Jorge Rosales, *Contract Solutions & Manf., Inc.*
Mr. José Rosales, *Los Alamos Nat. Lab*.
Mr. Russell Ortiz; *Trane Inc.*
Mr. Bob Sachs; *Team Technologies Inc.*
Mr. Danny Sachs; *Team Technologies Inc.*
Mr. Erik Skarsgard; *Jacobs Technology/WTSF*

Student Members

Mr. Orlando Padilla, Mr. Simón Saez, Mr. Aaron Turner, and Mr. Matthew Woodall

The industrial advisory committee plays an indispensable role in revising curriculum content to maintain the effectiveness of core courses, toward ensuring the validity of program educational objectives. This is accomplished within the overall continuous improvement process that relies upon the advisory committee, other constituencies, and a 'checks and balances' system to uphold the quality of the core courses.

Please also see folder entitled "IAC Members, Agenda, and Minutes" in the attached CD and Criterion 4, Part A above.

CRITERION 6. FACULTY

A. Faculty Qualifications

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

The core Mechanical Engineering Technology is comprised of Dr. Ing. Craig Ricketts (Program Coordinator), Prof. Anthony Hyde, and Asst. Prof. Manuel Gomez. Each of these faculty members has advanced degrees in Engineering with years of practical experience that they bring to the program. Our faculty and department are dedicated to professional development in order to bring the latest technology to the classroom and the most effective teaching methods to deliver the material. One of our primary development areas listed in the Department Professional Development Plan is the need to stay current in our specialty areas. Our core courses are taught by faculty members who have expertise in that area. Faculty members are not required to teach courses they have no background in or do not strive to teach.

We are fortunate in our department that faculty members have diverse and complimentary backgrounds and interest areas and are available to teach courses and topics in their field of expertise. The educational objectives and program outcomes are obtainable through theses backgrounds and diverse methods of instruction. The MET and ECET faculty teach nine required courses. Additionally, adjunct professors are available to teach other specialty areas. Please refer to the above individual curriculum vitas provided in Appendix B for related backgrounds. A summary of technical specialty areas and instructors is below.

Technical Specialty Areas	Instructor(s)
Fluids/Hydraulics/Hydrology	C.Ricketts, Stevens, Cooper
Manufacturing	A. Hyde
Dynamics, Manufacturing	M. Gomez
Statics	R. Jiang, C. Ricketts
Strength of Materials	S. Cooper, K. Stevens
Thermodynamics/Heat Transfer	C. Ricketts
Kinematics of Machines	M. Gomez
Statistics	M. Gomez, C. Boje
Project Management	C. Ricketts, A. Hyde

Table 6-1. Faculty Qualifications

Bachelor of Science in Engineering Technology- Mechanical Engineering Technology

Faculty Name	Highest Degree Earned- Field and Year	Rank [1]	Type of Academic Appointment [2] T, TT, NTT	FT or PT [4]	Years of Experience			Professional Registration/ Certification	Level of Activity H, M, or L		
					Govt./Ind. Practice	Teaching	This Institution		Professional Organizations	Professional Development	Consulting/summer work in industry
Craig Ricketts	Dr. Ing, Mechanical Process Engineering, 1992	ASC.	T	FT	15	19	19	EIT	H	M	M
Manuel Gomez	MSME,1992/ MA, Econ 1991	AST	TT	FT	10	5	5	Six-Sigma MBB Cert.	M	H	L
Anthony Hyde	MS Mfg Eng., 1991	P	T	FT	5	20	20	FE-1986 CMfgEng91 CMfgTec90	M	H	H

Approximately half of the required courses in the Mechanical ET curriculum are also required courses in the Civil ET program. The following is a list of the Civil ET faculty.											
Sonya Cooper	Ph.D., Material Science, 2000	P	T	FT	20	17	17	NM	H	H	H
Kenny Stevens	M.S. Civil Engineering, 1983	ASC	T	FT	9	14	14	NM	H	H	H
Ruinian Jiang	Ph.D. Civil Engineering	ASC	TT	FT	15	6	6	NM	M	H	M
The following Electronics and Computer Engineering Technology and Information Engineering Technology faculty are available to teach the core courses and technical electives used by all four Engineering Technology programs.											
Jeff Beasley	Ph.D. Electrical Engineering, 1995	P	T	FT	10	22	22	EIT NM	M	H	H
Tom Jenkins	MSCS, Computer Science, 1977 MSEE, Electrical Engineering, 1988	P	T	FT	14	20	20		M	M	L
Lynn Kelly	MSIE, Industrial Engineering, 1994	ASC	T	FT	7	14	14		M	H	L
Michael Morrell	MA, Computer Science, 2000	AST	T	FT	27	8	8		M	M	H

Carmen Boje	M.S., 1998	I	NTT	FT	10	19	3.5		L	H	L

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

1. Code: P = Professor ASC = Associate Professor AST = Assistant Professor I = Instructor A = Adjunct O = Other

2. Code: TT = Tenure Track T = Tenured NTT = Non Tenure Track

3. The level of activity, high, medium or low, should reflect an average over the year prior to the visit plus the two previous years.

4. At the institution

B. Faculty Workload

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

Table 6-2. Faculty Workload Summary

Mechanical Engineering Technology

Faculty Member (name)	PT or FT[1]	Classes Taught (Course No./Credit Hrs.) Term and Year[2]	Program Activity Distribution[3]			% of Time Devoted to the Program[5]
			Teaching	Research or Scholarship	Other[4]	
Craig Ricketts	FT	ET 306/L – Fundamental and Applied Thermodynamics and Lab ET 308L – Fluid Technology Lab ET 422(L) Mechanical Measurements Lab ET 435 – Senior Design and Project Management	100%			100%
Anthony Hyde	FT	ET 217 – Manufacturing Processes ET 415 – Manufacturing Management and Productivity	25%		75% M-TEC Director	25%
Manny Gomez	FT	ET 241 – Applied Dynamics ET 302 – Manufacturing Data Analysis ET 305 –Design for Manufacturing ET 426 – Analysis and Design of Machine Elements	100%			100%
Sonya Cooper	FT	ET 310 - Applied Strength of Materials ET 332- Applied Design of Structures I ET 354 & 354L - Soil and Foundation Technology ET 355 - Site / Land Development and Layout ET 420 - Project Analysis ET 421- Senior Project	25%		75% ET C	25%

		ET 454 – Advanced Construction Technology				
Kenny Stevens	FT	ET 254 - Concrete Technology ET 308 – Fluid Technology ET 310 – Applied Strength of Materials ET 386 – Sustainable Construction and Design ET 418 – Applied Hydraulics	25%		75% ET C	25%
Ruinian Jiang	FT	ET 240 – Applied Statics ET 412 – Highway Technology ET 432 /L – Applied Design of Structures II ET 442 – Intelligent Transportation Systems ET 455 – Cost Estimation and Scheduling	25%		75% ET C	25%
Jeff Beasley	FT	ET 101 – Introduction to Engineering Technology ET 410 – Senior Seminar	25%		75% depart head	25%
Tom Jenkins	FT	ET 182 – Digital Logic ET 190 – Applied Circuits ET 381 – Renewable Energy Technologies ET 382 – Solar Energy Technology ET 384 – Wind and Water Technology	50%		50% ET EC	50%
Carmen Boje	FT	ET 120 – Computation and Presentation Software ET 190 – Applied Circuits	25%		75% ICT	25%
Lynn Kelly	PT	ET 262 – Software Technology I	25%		75% ET EC	25%
Eduardo Gamillo	PT	ET 110 – Introduction to Computer-Aided Drafting and Design	15%		85% M-TEC staff	15%

Wes Eaton	PT	ET 210 – Computer-Aided Drafting and Design	10%		90% M-TEC staff	10%
Charles Park	PT	ET 217L – Manufacturing Processes Lab	20%		80% M-TEC staff	20%
Holly Ricketts	PT	ET 120 – Computation and Presentation Software	25%		75% IT staff	25%
Chris Wise	PT	ET 310L – Strength of Materials Lab	10%		90% Dept. staff	10%

C. FT = Full Time Faculty or PT = Part Time Faculty, at the institution
D. For the academic year for which the self-study is being prepared.
E. Program activity distribution should be in percent of effort in the program and should total 100%.
F. Indicate sabbatical leave, etc., under "Other."
G. Out of the total time employed at the institution.

H. Faculty Size

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

There are 3 full-time faculty assigned to the Mechanical Engineering Technology program. The primary responsibility of these faculty are teaching the core Mechanical ET classes and supporting student learning. In addition these faculty provide academic advising to all students in the program, which includes course selection, career development, job placement, advise student organizations, and supervise senior projects. The Mechanical ET faculty are very involved in and proactive with the core mission of the department, which is to provide students with a quality engineering technology and surveying education that links theory and application, provides a rigorous, fundamental education, and gives students enhanced career opportunities.

The department's goals supporting this mission are:

1. to provide educational and social environments that promote and facilitate student learning
2. to have a highly respected and visible department
3. to foster the development of the department and
4. to graduate students who are competent and sought after by industry

In addition, the faculty involve the students in student project activities where the students are given the opportunity to apply their knowledge in Engineering and Technology to real world design and manufacturing problems.

I. Professional Development

Describe the professional development activities that are available to faculty members.

The faculty in the NMSU Engineering Technology Department has a rich resume of professional development activities shown as History of Professional Development below. Our faculty understands and appreciates the need for professional development in order to facilitate our overall educational objectives and program outcomes, and to satisfy needs for professional growth. Our faculty chooses professional development activities that attend to a variety of learning approaches that will be most effective. Like our students, the types of activities our faculty prefer, offer engaging, hands-on approaches. Due to our limited time available for professional development compared to other responsibilities, we appreciate professional development that is well-planned, and is efficiently delivered.

In the past, our faculty members have identified professional development areas and attended to their respective needs on an individual basis. This has worked well given the history of activities identified collectively. There is a need, however, to document and

assess the success of professional development in the form of a 'plan'. This year our faculty members were asked to submit personal professional development plans along with their yearly performance evaluations. We have identified the following development areas based on these plans, in conjunction with our educational objectives and program outcomes, and promotion and tenure guidelines. They are labeled A-K below. We then identified avenues to accomplish A-K. These are labeled 1-14 below. We also extracted the development areas and categorized them according to full, associate, and assistant professors. This exercise was useful to evaluate the overall importance of the development area to faculty member rank.

Due to all the responsibilities a faculty member has to juggle, time devoted to professional development hours is limited, and given low priority compared to other responsibilities. History shows that the department spends on average $6-$7,000 per year for professional development. In order to establish a baseline of expected dollars required for sufficient professional development, we use the New Mexico State Board of Licensure for Professional Engineers and Surveyors requirement for professional development as an example. The minimum requirement to maintain professional registration is 30 Professional Development Hours (PDHs) for two years. This equates to approximately $1,500 per faculty member, per year, for various combinations of the below avenues. The department goal is to match half of that requirement. For 12 faculty members, this corresponds to $9,000 per year or $750 per faculty member. Because conferences cost approximately $1500, an appropriate approach is to fund 6 faculty members every year.

The department head will keep track of the rotation of faculty members and remind them of their 'turn' to be funded during performance evaluations each year. The faculty member will identify development areas on their yearly 'goals and objectives' list. The department head will use this list to help the faculty member plan these activities and to be aware when opportunities arise in that area. Upon return from the function, the department head will require a summary of the event to include how the development areas were satisfied. The faculty member will keep a copy for their promotion file, to be reviewed each spring by the department Promotion and Tenure Committee.

History of Professional Development Activities -
A history of professional development activities by year is listed below. The instructor's name(s) is listed by each item. *(Number)* indicates the number of faculty members attending.

2006
Kenny Stevens - NMSU Teaching Academy, Classroom Development, Nov. 2006
Kenny Stevens - New Mexico Groundwater Association Workshop
Kenny Stevens - ASCE Branch Meetings.
Kenny - NM Ready Mix Association
Kenny Stevens - Associated General Contractors Regional Conference
Kenny Stevens - ASCE State Section Meeting

Sonya Cooper - Reno Bidding Competition Faculty Conference, (Technical lectures) Reno Nevada
Sonya Cooper - ABET Summit Meeting (Accreditation Administration training) Washington DC, July 7-10
Sonya Cooper - Academic Leader conference, Webcast
Sonya Cooper - NM ASCE Section conference

Ruinian Jiang – new faculty orientation
Ruinian Jiang - Registration for Faculty Mentoring Program, September, 2006 NMSU Teaching Academy
Ruinian Jiang - ADVANCE - Mentoring Program Orientation, September, 2006 NMSU Teaching Academy
Ruinian Jiang - Transportation Research Board Annual Conference Washington D.C, January 2006
Ruinian Jiang - 43rd Paving Conference, UNM Albuquerque, January 2006

Craig Ricketts - Attended and presented paper, *The Evolution of a Capstone Design Course to Include Outcomes Assessment*, at 2006 ASEE Gulf Southwest Section Conference, Baton Rouge, LA, March 2006.
Craig Ricketts - Attended and presented paper, Performance *Specifications and a Prototype Test Apparatus for Qualification of High-Strength HEPA Filter Designs,* 29th Nuclear Air Cleaning Conference, Cincinnati, OH, July 2006.
Craig Ricketts – Project Technical Manager for ongoing revision of Code Section FG (Mounting Frames) and Project Technical Manager for revision of Code Section FA (Moisture Separators) of ASME AG-1 Code on Nuclear Air and Gas Treatment.
Craig Ricketts - Participated via teleconference in Winter meeting of subcommittee on Filtration to discuss changes to Code Sections FC, FG, and FK of ASME AG-1 Code on Nuclear Air and Gas Treatment FC (HEPA Filters) Project Team.
Craig Ricketts - Attended Summer meetings of Main Committee of ASME Committee on Nuclear Air and Gas Treatment (CONAGT) Filtration Subcommittee of ASME CONAGT FC (HEPA Filters) Project Team FK (Special HEPA Filters) Project Team.
Craig Ricketts - Attended International Society of Nuclear Air Treatment Technologies (ISNATT) biannual business meeting, Cincinnati, OH, July 2006.

Antony Hyde - Participant in Annual Meeting NMACTE- New Mexico Association Career and Technical Education -2006, Ruidoso NM

Kurt Wurm - CCPS Denver, CO The manual of surveying instructions, 1973 and the next edition
Kurt Wurm - CCPS Denver, CO Colorado Land Surveying Laws, Board Rules, and policies addressing Surveying
Kurt Wurm - NMPS Bernalillo, NM, Exhibitor
Kurt Wurm - ACSM Annual Conference, Orlando, FL, Higher Order Surveying in the Southeastern USA
Kurt Wurm - Llano Escatado/Permian Basin Ruidoso Ethics: Responsible Charge & Professionalism

Kurt Wurm White Mountain Chapter APLS Pinetop, AZ A new twist to corner recovery

Tom Jenkins – NM Space Grant Consortium – Jenkins - did semester long classroom observation for **GRASP:** "Gaining Retention and Achievement for Students Programs", Spring 2006

Tom Jenkins - Attended and acted as Session Chair of the **New Mexico Space Grant Consortium 8th Annual Science, Engineering, & Technology Education Conference – Jan. 13th, 2006,** Paper presented and published for this SETE conference above. Jan. 2006

Tom Jenkins – Attended and session chair at a four day ***"International Conference on Engineering Education (ICEE)"*** in Puerto Rico, July 2006. A peer reviewed paper was presented and published for this conference.

Tom Jenkins – Attended an eight hour **"Photovoltaic Power Systems and the 2005 National Electrical Code" workshop** by John Wiles of SWTDI, May 2006.

Tom Jenkins – Reviewed submitted journal articles for the *Technology Interface* – the Electronic Journal for Engineering Technology

Tom Jenkins – Attended the NMSU Teaching Academy workshops:

- *"Grant Writing: A Nuts and Bolts Approach" – Kenneth T. Henson, The Citadel,* ***workshop*** *at the Teaching Academy, NMSU 2006*
- *"Writing for Publication: Road to Academic Success" – Kenneth T. Henson, The Citadel,* ***workshop*** *at the Teaching Academy, NMSU 2006*

Lynn Kelly - 2006 - Science, Engineering & Technology Education Conference

Lynn Kelly - Teaching Academy workshops

Jeff Beasley – Cisco Networking Academy Instructor continuing education

Jeff Beasley - Editor and founder of the *Technology Interface Journal, a peer-reviewed on-line Journal,* Editor.

2007

National Capstone Design Course – Boulder, CO Jiang .....$ 936

ASEE Annual Conference – Honolulu, Hawaii Morrell, Kelly, ...$ 1,957

ASME Conference – Columbus, OH - Ricketts .....$ 978

ASCE Meeting – Ruidoso, NM – Jiang, Stevens, and Cooper.....$487

ASCE – Seattle, WA – Stevens $410

Kenny Stevens - Engineers Without Borders Regional Conference and Workshop. October 2007

Kenny Stevens - Associated General Contractors Regional Conference

Kenny Stevens - NM Ready Mix Association

Kenny Stevens - ASCE State Section Meeting

Sonya Cooper - Teaching Academy, (Leadership Workshops 8 total hours), NMSU

Sonya Cooper - ADVANCE PAID retreat, (Department head training), Socorro NM

Sonya Cooper - Reno Bidding Competition Faculty Conference, (Technical lectures) Reno Nevada
Sonya Cooper - ABET Summit Meeting, (Accreditation Administration training) Washington DC
Sonya Cooper - NM ASCE Section conference, Albuquerque

Ruinian Jiang - The 1st National Capstone Design Conference, Boulder, CO, May, 2007
Ruinian Jiang - ASCE New Mexico Section Fall Meeting NMSU ASCE Section
Ruinian Jiang - ASCE New Mexico Southern Branch Meetings

Craig Ricketts - Project Technical Manager for ongoing revision of Code Section FG (Mounting Frames), Project Technical Manager for revision of Code Section FA (Moisture Separators), and Project Technical Manager for development of Code Section FM (High-Strength HEPA Filters) of ASME AG-1 Code on Nuclear Air and Gas Treatment.

Craig Ricketts - Participated via teleconference in Winter meetings of subcommittee on Filtration to discuss changes to Code Sections FC, FG, and FK of ASME AG-1 Code on Nuclear Air and Gas Treatment FC (HEPA Filters) Project Team.
Craig – Ricketts - Attended Summer meetings of Main Committee of ASME Committee on Nuclear Air and Gas Treatment (CONAGT) Filtration Subcommittee of ASME CONAGT, FC (HEPA Filters) Project Team, FK (Special HEPA Filters) Project Team, FM (High-Strength HEPA Filters) Project Team, as Chair.

Anthony Hyde - National PLTW University Affiliate Directors Meeting, Charlotte North Carolina 2007
Anthony Hyde - Participant in Annual Meetings NMACTE- New Mexico Association Career and Technical Education -2007, Ruidoso NM

Kurt Wurm - NM Height Mod workgroup NMSU Height Moderninzation Forum
Kurt Wurm - Llano Escatado/Permian Basin Ruidoso Professionalism and Ethics for Land Surveyors
Kurt Wurm - Land Descriptions Ruidoso Intro Classroom Tech
Kurt Wurm - GIS in the Rockies Denver, CO
Kurt Wurm - Land Survey Measurements and GIS - City of Aurora collaboration
Kurt Wurm - GIS in the Rockies Denver, CO City of Denver Range Point Recovery
Kurt Wurm - GIS in the Rockies Denver, CO Energy Exploration using GIS & BLM's NILS
Kurt Wurm - GIS in the Rockies Denver, CO The future of GIS & geography
Kurt Wurm - GIS in the Rockies Denver, CO CAD to GIS: Preserving real-world coordinates
Kurt Wurm - GIS in the Rockies Denver, CO Using Google Earth for command and control in emergency response
Kurt Wurm - GIS in the Rockies Denver, CO 3-d modelling and virtual reality

T. Jenkins - Attended (and acted as session chair) at the **Fifth LACCEI International Latin American and Caribbean Conference for Engineering and Technology (LACCEI'2007) –** Tampico Mexico 2007

- A peer reviewed paper *"Renewable Energy Technology: Engineering and Engineering Technology Educational Opportunities"* was presented at this conference.

Tom Jenkins - Authored the peer reviewed technical paper "*WebCT in Assessment: Using On-Line e-Tools to Automate the Assessment Process*" which was presented at the **2007 National ASEE Conference** in Hawaii 2007

Tom Jenkins - Authored the peer reviewed technical paper *"Opportunities in Engineering and Engineering Technology Education: Renewable Energy Technologies"* which was presented at the **2007 ASEE Rocky Mountain Section Conference**, Utah 2007

Tom Jenkins - **Reviewed** submitted journal articles for the *Technology Interface* – the Electronic Journal for Engineering Technology and the Frontiers in Education Conference 2007

Tom Jenkins - Attended the **NMSU Teaching Academy workshops**:

- *"Writing for Publication"*
- *"Five Easy Ways to Retain Students"*
- *"Grantsmanship at NMSU: Processes, Strategies, and Support"*

Lynn Kelly - 2007 – ASEE Conference attendance

Jeff Beasley – Cisco Networking Academy Instructor continuing education

Jeff Beasley - Editor and founder of the *Technology Interface Journal, a peer-reviewed on-line Journal,* Editor.

Carmen Boje - helped with the opening of the new Society of Women Engineers at NMSU with the purpose of developing more interesting activities for our students that can attract more women in the Engineering field.

2008

ASCE Leadership Workshop – Jiang .....$ 342
AGC Bidding Competitions – Cooper.....$ 531
ASCE Fall Meeting – Ruidoso, NM, Cooper .....$ 268

Kenny Stevens - Engineers Without Borders Regional Conference and Workshop. October 2008

Kenny Stevens - Associated General Contractors Regional Conference

Kenny Stevens - NM Ready Mix Association

Kenny Stevens - ASCE State Section Meeting

Sonya Cooper - Advancing Leaders , (Leadership Workshops 30.50 total hours), NMSU
Sonya Cooper - Reno Bidding Competition Faculty Conference, (Technical lectures) Reno Nevada
Sonya Cooper - ASCE Lecture (1 PDH), (Biaxial Geogrids for Soft Soils and Flexible Pavement), NMSU
Sonya Cooper - AREMA Railroad Engineering Educational Symposium Univ of Illinois
Sonya Cooper - ABET Summit Meeting, (Accreditation Administration training) Washington DC

Ruinian Jiang - Writing across the curriculum - Summary 2008, Monday, August 17, 2009 NMSU Teaching Academy
Ruinian Jiang - Leadership Conference, ASCE, Austin, Texas, May, 2008, ASCE
Ruinian Jian - ASC Regions 6 & 7 Annual Student Competition Faculty Workshop February, 2008, American School of Construction

Craig Ricketts - Attended and presented paper, *Development of a Root Crop Washing Station for Small Farmers*; (with co-presenters C. L. Falk and J. J. Ytuarte), at New Mexico Organic Farming Conference, Albuquerque, NM, March 2008.
Craig Ricketts - Attended and presented paper, *Toward Realization of Filter Performance Specifications for the Qualification of Higher-Strength HEPA Filter Units;* at 30th Nuclear Air Cleaning Conference, Seattle/ Bellevue, WA, 25-27 August 2008.
Craig Ricketts - Project Technical Manager for ongoing revision of Code Section FG (Mounting Frames), Project Technical Manager for ongoing revision of Code Section FA (Moisture Separators), and Project Technical Manager for development of Code Section FM (High-Strength HEPA Filters) of ASME AG-1 Code on Nuclear Air and Gas Treatment.
Craig Ricketts - Attended Winter and Summer meetings of Main Committee of ASME Committee on Nuclear Air and Gas Treatment (CONAGT) Filtration Subcommittee of ASME CONAGT, FC (HEPA Filters) Project Team, FK (Special HEPA Filters) Project Team , FM (High-Strength HEPA Filters) Project Team, as Chair.
Craig Ricketts - Attended biannual business meeting of International Society of Nuclear Air Treatment Technologies (ISNATT), Bellevue, WA, August 2008.

Anthony Hyde - New Mexico Educate/Innovate Conference 2008- Presenter- Presented on the Growth and Development of Project Lead the Way in NM. Albuquerque.
Anthony Hyde - Participant in New Mexico Educate/Innovate Conference – Las Cruces 2007
Anthony Hyde - Solid Modeling Training Certification Level one certification- 40 hours course Certification – MCAD Albuquerque May 2008
Anthony Hyde - Trained and Certified as a PLTW High School Certification Evaluator. - Albuquerque 2008
Anthony Hyde - Participant in Annual Meetings NMACTE- New Mexico Association Career and Technical Education -2008, Ruidoso NM

Kurt Wurm - Las Cruces, NM Riparian Doctrines, Boundaries and Rights
Walt Robillard

Tom Jenkins - Attended and acted as session chair for the - **Sixth LACCEI International Latin American and Caribbean Conference for Engineering and Technology** (LACCEI) *4 June – 6 June 2008, Tegucigalpa, Honduras*

- Authored and presented peer reviewed paper *"Sustainable Energy Technology Curriculum Components: A Model Methodology for Engineering or Engineering Technology Programs"* at this conference.

Tom Jenkins - **Teaching Workshops** Attended:

- *"Is there a Fulbright in your Future", 2008*

Tom Jenkins - Reviewed submitted journal articles for the *Technology Interface* – the Electronic Journal for Engineering Technology

Lynn Kelly - Computer Forensics Training Course
Lynn Kelly - Reviewer Technology Interface

Jeff Beasley – Cisco Networking Academy Instructor continuing education
Jeff Beasley - Editor and founder of the *Technology Interface Journal, a peer-reviewed on-line Journal,* Editor.
Jeff Beasley - **Modern Electronic Communication**, Co-author with Gary Miller, **9ᵗʰth** edition, 2008.

Carmen Boje – Paper review – the Technology Interface Journal

2009

Kenny Stevens - Associated General Contractors Regional Conference
Kenny Stevens - NM Ready Mix Association
Kenny Stevens - ASCE State Section Meeting

Sonya Cooper - Advancing Leaders , (Leadership Workshops 11 total hours), NMSU
Sonya Cooper - Reno Bidding Competition Faculty Conference, (Technical lectures) Reno Nevada
Sonya Cooper - ABET Summit Meeting, (Accreditation Administration training) Washington DC
Sonya Cooper - NM ASCE Section conference, (8 hours technical presentations Including ethics), Ruidoso NM

Ruinian Jiang - ADVANCE - Mentoring Program Orientation, Friday, September 18, 2009 NMSU Teaching Academy
Ruinian Jiang - ASCE New Mexico Southern Branch Meetings NMSU ASCE Southern Branch
Ruinian Jiang - ASC Regions 6 & 7 Annual Student Competition Faculty Workshop February 12, 2009 American School of Construction

Ruinian Jiang - Applying NMSU's new policies for promotion and tenure
May 13, 2009, Teaching Academy, NMSU
Ruinian Jiang - ADVANCE - Mentoring Program Orientation
Friday, September 18, 2009 , Teaching Academy, NMSU
Ruinian Jiang - ASCE New Mexico Section Fall Meeting
Thursday &Friday, September 24, 25, 2009, NMSU ASCE Section

Craig Ricketts - Presented on topic of, *Renewable Energy Potential for New Mexico*; to the local chapter of Sigma Xi, Scientific Research Society, Las Cruces, NM, January 2009.

Craig Ricketts - Project Technical Manager for investigation into proposed deletion of rough handling test requirement in Code Section FA (Moisture Separators) and Project Technical Manager for development of Code Section FM (High-Strength HEPA Filters) of ASME AG-1 Code on Nuclear Air and Gas Treatment.
Craig Ricketts - Attended Winter and Summer meetings of Main Committee of ASME Committee on Nuclear Air and Gas Treatment (CONAGT) Filtration Subcommittee of ASME CONAGT, FC (HEPA Filters) Project Team , FK (Special HEPA Filters) Project Team, FM (High-Strength HEPA Filters) Project Team, as Chair.

Anthony Hyde - PLTW National Symposium on HS Engineering Education- Oct 2009, Chicago, Ill, Represented NM as the University Affiliate Director- National Affiliate Directors meeting held at this conference.
Anthony Hyde - Legislative Night with Stem Educators- Santa Fe, NM Sept 2009– Opportunity to Discuss STEM education with NM Legislators
Anthony Hyde - PLTW National Symposium on HS Engineering Education- Oct 2009, Phoenix, AX Represented NM as the University Affiliate Director- National Affiliate Directors meeting held at this conference.
Anthony Hyde - ASEE National Conference- Paper/ Presenter- A Bridge to Somewhere, Creating STEM Pathways in NM Higher Education. Austin Texas, 2009
Anthony Hyde - ASEE/CIEC January 2009 –Orlando Florida-Conference on Industry and Education Collaborations- Orlando- Presenter/Paper – Changing the STEM Landscape in New Mexico
Anthony Hyde - Participant in 3 Annual Meetings NMACTE- New Mexico Association Career and Technical Education -2006-2009 – Ruidoso NM
Anthony Hyde - Participant in Annual Meetings NMACTE- New Mexico Association Career and Technical Education -2009, Ruidoso NM
Anthony Hyde - 2009 PLTW Core Summer Training- Trained 26 teachers in Intro to Engineering Design and Civil and Architectural Engr. Las Cruces NM
Anthony Hyde - Using CAD/CAM to Improve Manufacturing- trained WSTF personnel on how to use CAD and Cam to improve Productivity. Conferences were held in 2010 at NMSU/Las Cruces, 2009 Santa Fe Community College/Santa Fe, and 2008 NMSU-C/ Carlsbad.

Manny Gomez - New Faculty Orientation - Fall 2009

Monday, August 17, 2009 Teaching Academy
Manny Gomez - ADVANCE - Registration for Faculty Mentoring Program
Monday, September 2, 2009, Teaching Academy
Manny Gomez - ADVANCE - Mentoring Program Orientation, Friday, September 18, 2009, Teaching Academy
Manny Gomez - ADVANCE - Don't Burn Out, Burn Bright: Strategies to Thrive in Difficult Times, Friday, November 13, 2009, Teaching Academy
Manny Gomez - Clicker Demonstration (12/09/2009)
Wednesday, December 9, 2009, Teaching Academy

Kurt Wurm - Fresno 48th Geomatics Conference Fresno, CA Liability and the professional Land Surveyor: If You're not looking out for yourself, who is?
Kurt Wurm - Fresno 48th Geomatics Conference Fresno, CA Laser Scanning Panel Discussion
Kurt Wurm - Fresno 48th Geomatics Conference Fresno, CA Licensure, Certification and Procurement Guidelines
Kurt Wurm - Fresno 48th Geomatics Conference Fresno, CA Professional Responsibility
Kurt Wurm - Fresno 48th Geomatics Conference Fresno, CA International Perspective on Surveying
Kurt Wurm - Fresno 48th Geomatics Conference Fresno, CA The Evolution of Surveying
Kurt Wurm - ACSM-MARLS-UCLS-WFPS Salt Lake City, UT Subdivision of Sections, the 3 mile method
Kurt Wurm - Llano Estacado NMPS/Permian Basin TSPS Ruidoso, NM CSI(Corner Site Investigation) Forensics of Surveying
Kurt Wurm - Middle Rio Grande NMPS Albuquerque An Ethical Review of the Maxims of Jurisprudence

Tom Jenkins - Attended the **Re-Energize America Conference** Monday, August 31 – Tuesday, September 01, 2009
Tom Jenkins - **Teaching Workshops** Attended:
- *"Grant Proposal Development Workshop"* on November 6th, 2009

Tome Jenkins - Reviewed submitted journal articles for the *Technology Interface* – the Electronic Journal for Engineering Technology

Tom Jenkins - **Extensive use of professional organizations and journals** to maintain currency with areas related to my teaching activities; and interact with similar professionals (networking).

Lynn Kelly - 2009 – Reviewer Technology Interface
Lynn Kelly - Blackboard Techniques Workshop
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Jeff Beasley – Cisco Networking Academy Instructor continuing education

Jeff Beasley - Editor and founder of the *Technology Interface Journal, a peer-reviewed on-line Journal,* Editor.
Jeff Beasley, **Networking**, 2nd edition, Prentice Hall, 2009

Carmen Boje - participated for 3 weeks during summer in ITAL program to learn to use better blackboard and create more professional online courses.
Carmen Boje - participated in the NMSU Teaching academy program

2010

Kenny Stevens - ASCE Branch Meetings
Kenny Stevens - Associated General Contractors Regional Conference
Kenny Stevens - NM Ready Mix Association
Kenny Stevens - ASCE State Section Meeting

Sonya Cooper - ASCE Section Officer Conference for new Officers , (Administration workshops and gov't. relations) Cleveland Ohio
Sonya Cooper - Reno Bidding Competition Faculty Conference, (Technical lectures) Reno Nevada
Sonya Cooper - Seminario de Maquinaria, (Heavy Equipment technical lectures) Chihuahua Mexico
Sonya Cooper - ABET Summit Meeting, (Accreditation Administration training) Washington DC
Sonya Cooper - China Delegation, (Technical Presentations 2 hrs) Las Cruces, NM
Sonya Cooper - NM/Texas ASCE Section conference, (4 hours technical presentations. Presented paper), El Paso Tx
Sonya Cooper, China Delegation, (Technical Presentations 3 hrs) NMSU
Sonya Cooper - CINT Conference, Santa Fe NM

Ruinian Jiang - ASC Regions 6 & 7 Annual Student Competition Faculty Workshop Thursday, February 11, 2010, American School of Construction
Ruinian Jiang - ADVANCE - Faculty Mentoring Progra: Work/Life Integration for Faculty, Thursday, March 11, 2010 , Teaching Academy, NMSU
Ruinian Jiang - ADVANCE - Spring Promotion and Tenure Workshop, Monday, March 15, 2010, Teaching Academy, NMSU
Ruinian Jiang - International Bridge Inspection Training Course September 9 - 10 , 2010 College of Engineering, NMSU

Kurt Wurm - 2010 NMPS Convention	Albuquerque	Forensic Surveying
Kurt Wurm -2010 NMPS Convention	Albuquerque	Real Time Networks
Kurt Wurm -2010 NMPS Convention	Albuquerque	Boundary Issues ant the PLSS
Kurt Wurm -2010 NMPS Convention	Albuquerque	New Mexico, Riparian Facts

and Fiction

Kurt Wurm -2010 NMPS Convention Professional Surveyors	Albuquerque	Legal Issues for NM
Kurt Wurm -2010 ACSM Convention	Phoenix	Forensic Surveying

Craig Ricketts - Generated and presented two white papers: *Issues related to prospective need for a separate AG-1 Code Section to address performance standards and qualification of glass-fiber filter media*, and *Issues related to prospective need for a new AG-1 Code Section for qualification of HEPA filters having a glass-fiber filter medium for maximum-rated temperatures > 120 °C*, to the Filtration Subcommittee of ASME CONAGT, San Diego, CA, March 2010.

Craig Ricketts - Participant in three-day, on-site, peer review of DOE-sponsored experimental evaluation of radial-flow HEPA filter performance with respect to prospective implementation at planned Hanford Waste Treatment Plant, Starkville, MS, June 2010.

Craig Ricketts - Attended and presented two papers: *Realization of Performance Specifications for the Qualification of High-Strength HEPA Filters; and Realization of a Prototype Full-Scale Test Rig for the Qualification of High-Strength HEPA Filters* at 31st Nuclear Air Cleaning Conference, Charlotte, NC, 19-21 July 2010.

Craig Ricketts - Attended and led background evaluation of prospective officer slate candidates at biannual business meeting of International Society of Nuclear Air Treatment Technologies (ISNATT), Charlotte, NC, July 2010.

Craig Ricketts - Presented summary of total incurred and future projected costs toward completion of AG-1 Code Section FM (High-Strength HEPA Filters) to Filtration Subcommittee of ASME CONAGT, Charlotte, NC, July 2010.

Craig Ricketts - Project Technical Manager for ongoing development of Code Section FM (High-Strength HEPA Filters) of ASME AG-1 Code on Nuclear Air and Gas Treatment.

Craig Ricketts - Attended Winter and Summer meetings of Main Committee of ASME Committee on Nuclear Air and Gas Treatment (CONAGT) Filtration Subcommittee of ASME CONAGT, FC (HEPA Filters) Project Team, FK (Special HEPA Filters) Project Team, FM (High-Strength HEPA Filters) Project Team, as Chair.

Anthony Hyde - ASABE 2010– Pittsburg, Pa- International Conference on American Society of Agricultural and Biological Engineers- Presenter/Paper- Design of a High Production Chile De-stemmer.

Anthony Hyde - Spaceport America- Industry and STEM Leaders Meeting. October 6th, 2010, Las Cruces NM

Anthony Hyde - Attended Regional Meeting for Texas A&M Engineering Extension Consortium as NMSU College of Engineering representative, NMSU is part of this Engineering Extension/Research Consortium. (TEES) June 2010

Anthony Hyde - PLTW National Innovation Summit Oct 2010- Washington DC. Represented NM as the University Affiliate Director- National Affiliate Directors meeting held at this conference.

Anthony Hyde - Attended PLTW University Consortium Initiative to Partner and

Collaborate on a National Level. Meeting held at Duke University, Chapel Hill NC, January 2010

Anthony Hyde - 2010 PLTW Core summer Training 52 teachers in 5 different PLTW courses. Intro to Engr Design, Engr Design and Dev, Gateway to Technology, Principles of Engineering, Mech and Aerospace Engineering.

Manny Gomez - New Faculty Orientation to Assessment (01/08/2010) Friday, January 8, 2010, Teaching Academy

Manny Gomez - ADVANCE - Faculty Mentoring Program: Work/Life Integration for Faculty Thursday, March 11, 2010, Teaching Academy

Manny Gomez - ADVANCE - Get a Head Start for Tenure Review (03/15/2010) Monday, March 15, 2010 , Teaching Academy

Manny Gomez - ADVANCE - Department Head's Role in Spring Promotion and Tenure Review, Tuesday, March 16, 2010, Teaching Academy

Manny Gomez - How to Beat the Lecture/Textbook Trap! (03/17/2010) Wednesday, March 17, 2010, Teaching Academy

Manny Gomez - ABET Symposium, April 15-17, 2010 Las Vegas Nevada

Manny Gomez - Project Lead the Way – Affiliate Professor Training (Aerospace) June 7-11, 2010 Las Cruces, NM

Manny Gomez - Essential Writing Skills – Resume & Cover Letter, Thursday, November 4th, 2010 Las Cruces, NM, Teaching Academy

Manny Gomez - Effective Grading & Assessment Strategies, Friday, November 12, 2010 Las Cruces, NM , Teaching Academy

Tom Jenkins - Became member of **graduate faculty**.

Tom Jenkins - Attended and **Presented** at the *NMSU College of Engineering Technology Forum and Exchange* – PSL Las Cruces, NM, Feb. 2010

Tom Jenkins - Reviewed submitted journal articles for the *Technology Interface* – the Electronic Journal for Engineering Technology

Lynn Kelly - Embedded Systems, College Course, UC at Irvine

Lynn Kelly - Reviewer for VHDL Textbook

Lynn Kelly - Reviewer Technology Interface

Lynn Kelly - Online workshop on teaching engineering on-line

Lynn Kelly, Sonya Cooper, and Jeff Beasley - Fall Summit/Community Colleges

Jeff Beasley – Cisco Networking Academy Instructor continuing education

Jeff Beasley - Editor and founder of the *Technology Interface Journal, a peer-reviewed on-line Journal,* Editor.

Jeff Beasley - Network Simulator Mapping Guide: for Networking, 2nd edition, Prentice Hall, 2010

2011

All Faculty – College of Engineering, seminar and motivational training – January

Sonya Cooper - NM ASCE Section conference, (6 hours technical presentations)
Albuquerque NM

Jeff Beasley – Academy Training - Department Head Academy: How to Avoid Faculty Grievances
Jeff Beasley – HR Search Committee training

J. Authority and Responsibility of Faculty

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

The faculty in the department play important roles in the creation and in the development of courses used in the program. The faculty meet on regular basis and evaluate coursework and determine if the student outcomes and educational objectives are being met. If the student outcomes are not being met then recommendations are made by the faculty to modify existing class topics so the outcomes are being met. In some cases, the creation of a new course might be required.

In the case where a new course is created, all faculty are advised of the proposed new course. The pre-requisites are defined and when and how often the course will be offered is discussed. The new course description is then submitted to the Associate Dean of the college of engineering. The Associate Dean has to get approval of the new course from a committee comprised of all the Associate Deans at the University. After approval of all new courses by this committee, the courses are submitted to the State of New Mexico Higher Education Department for approval at the State level. This is needed so any course(s) associated with existing programs can receive state funding. Finally the course is added to the catalog and can be offered by the department.

CRITERION 7. FACILITIES

A. Offices, Classrooms and Laboratories

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

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

Non-laboratory space: Civil Program Faculty offices, administrative and other non-laboratory space in Engineering Complex III.

Room No.	**NAME**	**SIZE (Sq. ft.)**
130	Departmental Office	673
130A	Department Head's Office	285
130B	Departmental Office Workroom	177
134	Student Lounge/Study	927
134A	Student Organizations	256
160	Storage	618
242	Lab prep room (tables/chairs)	593
256	Storage (Computer D&S Lab)	165
267A	Servers	131
267B	Office - (Professional Staff)	211
269	Student Break Area	306
385	Faculty Office – Mechanical ET Program	179
390	Faculty Office – Mechanical ET Program	173
284	Faculty Office – Mechanical ET Program	180
379A	ET Conference Room	443
Total		**5496**

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

Classroom Facilities in ECIII used by the Mechanical ET Program:

Room No.	NAME	SIZE (Sq. ft.)
230	Classroom – with Project tables video projector, audio speakers, audio amplifier Cable + television	883
241	Faculty Projects	225
242	Classroom video projector, audio speakers, audio amplifier cable TV + television	450
336	Classroom	450
	Total	**2008**

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

Chemistry and Physics have their own laboratory facilities. The chemistry laboratory that is used for the course CHEM 110G was completely renovated in 1990 to bring it up to current OSHA and EPA standards (Chemistry Building, Room 107. PHYS 211L and PHYS 212L are held in adequate space in Gardner Hall, rooms 108 and 206, each having about 1,000 square feet of laboratory space and over 300 square feet for storage of experiments.

The department is primarily housed in Engineering Complex III (ECIII) located at the intersection of two major campus-walking malls. The large plaza in front of the building and the building's three-story lobby are the location of many student and faculty activities. Beside the laboratory facilities in ECIII, other laboratory facilities are available in Engineering Complex I (ECI). With a few exceptions, the laboratories in ECIII are equipped and scheduled by the Department of Engineering Technology while laboratories in ECI are the responsibility of Civil Engineering.

Laboratory Facilities in ECIII used by the Mechanical ET Program:

Room No.	NAME	SIZE (Sq. ft.)
106	Environmental Lab/Chemical Storage	1138/ 230
131	Fluids Technology Lab	837
137	HVAC/Thermodynamics./Heat Transfer Lab	1157
138	Material Testing Lab/Student Project Space	1157
161	Mechanical/Civil Projects Lab	658
230	Applied Design Lab (Project tables)	883
241	Faculty Projects	225
	Total	**6285**

Laboratory Facilities in ECI (available for use by the Mechanical ET Program)

Room No.	NAME	SIZE (Sq. ft.)
ECI-138	Material Strengths Lab	3314
ECI-150	Manufacturing Technology and Engineering Center	7140
	Total	**10,454**

Materials Testing Lab

Instron Universal Testing Machine - 50 kN
2- Soil Test Compression Machine – 60 kip
Tinius-Olsen Torsion Machine
Moore Rotating Fatigue Machine
Dynamic Penetrometer
Column Bucking Demo Apparatus
"Advanced Structures Set" including
-Truss members and connections
-slotted mass set
-load cell and amplifier
Beam Deflection Demo Apparatus
3 sets of Vishnay Cantilever Loading Frames with Analog Strain Indicators
Assorted Micrometers and Calipers
~ 30 - 4" x 6" Disposable Concrete Cylinder Molds
Rockwell Hardness Testing Machine
Shore Scleroscope

Material Strengths Lab

2- Tinius Olsen Universal Testing Machine – 60 kip
Tinius Olsen Universal Testing Machine – 120 kip with computer interface
Tinius Olsen Universal Testing Machine – 400 Kip
50 ft Composite (Concrete/Steel) Bridge Test Section w/ 100 k Loading Jack
Interchangeable fittings for Compression, Tension, and Modulus of Rupture Tests
Omega 10 kip Load Cell w/ Data Logger
Charpy Impact Machine
2 – 4000 g scale
1 – 60 lb scale
Assorted Extensometers
3 – Vishay Digital Strain Indicators
Concrete Consolidator
Dynamic Modulus Apparatus
2 – Drying Ovens
ASTM C-231 Type B Concrete Air Content Meter
ASTM C-173 Roller Air Meter
6 - Vishay Model P3 Strain Indicators
4 Slump Cones
Assorted Rods and Trowels
~ 20 each of 6x12, 4x8, and beam Re-usable Concrete Molds
Mortar Cube Molds

Fluid Technology Lab

Equipment: Flow Benches (2), Flow Meter Testing Apparatus, Vega Hydraulic Oil Bench, Pelton Wheel, Pressure Gage Calibration Device, Pipe Friction Testing Apparatus (2), Jet Impact Tester, Floating Vessel Stability Testing Apparatus, Open Channel Flow Apparatus, Self-Actuating, Hinged Gate Apparatus, *Ashcroft* Dead-Weight Testers (2), Pressure Volume Controllers (3), Inclined Reservoir Manometers (10), Variable-Reluctance Pressure Transducers (10), Carrier Demodulators for Variable-Reluctance Pressure Transducers (10), Bench-Top Windtunnel Apparatus, Table-Top Windtunnel, PC-based Data Acquisition System, digital analytical balances (2), triple-beam analytical balances (6), *Brookfield* Digital Viscometer, and misc. glassware.

Seven Table-Top Demonstration Devices (*borrowed from CAGE Dept.*): *Falling Ball Viscometer*, *Vessels Illustrating Pascal's Paradox*, *Set of Three Manometer Designs*, *Tanks with Falling Heads*, *Failure Modes of Dam under Hydrostatic Pressure*, *Hydraulic Jump Apparatus*, and *Two-Dimensional Trajectories of Liquid Efflux Streams*.

Ethics Videos (2): *Laboratory Efficiency* and *The Truesteel Affair*.

Field Trip Destinations: *Research Water Channel* in Aerolab of ME Dept. (on NMSU main Campus); Cheese Making Facility of *F&A Dairy* (in local industrial park).

Thermodynamics / Heat Transfer Lab / HVAC Lab

Equipment: Double Pipe Heat Exchanger, Air Flow Apparatus, Evaporative Cooling Test Apparatus, Finned-Tube Heat Exchanger Apparatus, Mixing Valve Apparatus with PID Controller, Engine & Dynamometer (single cylinder), Engine & Dynamometer (multi-cylinder), Vacuum Pump, Vacuum Chamber, Air Flow Meter (2), Digital Multimeters (6), Digital Oscilloscopes (3), Bench-Scale Vapor-Compression Refrigeration System, Handheld Electronic T/C Thermometers (3), Handheld Electronic Thermistor Thermometers (3), PC-based Data Acquisition System, Hot Plates (6), Hot Plate/Magnetic Stirrers (2), Magnetic Stirrers (2), Mercury Barometer, Watt Meter, Brake Fluid Boiling-Point Testers, (2) and Alcohol-in-Glass Thermometers (6).

Thermodynamics Lab (only)
Ethics Videos (2): *The Truesteel Affair* and *The Case of the Challenger Disaster*.

Field Trip Destination: *Cogeneration Plant* (on NMSU main Campus).

AutoCAD Labs

Our students have access to six labs that have current versions of AutoCAD and land development software. Two of these labs are located in the Doña Ana Community College Technical Studies building. This facility is within walking distance from the main campus.

B. Computing Resources

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

Ms. Holly Ricketts, a professional staff member, has 25 years of experience maintaining and upgrading the department's computers and electronic instrumentation. She supervises a staff of part-time students that assist with repairing, maintaining, configuring, upgrading, and writing specifications for electronic equipment. Additionally, she conducts equipment inventories and maintains the Department's computer networks. She keeps track of software licensing, and has often obtained grants or large discounts beyond the usual educational discounts on software, computer hardware, and electronic instrumentation. Ms. Ricketts attends many training seminars to remain current in order to effectively manage the computer facilities and her staff. She has received professional staff awards for her exceptional service to the department and college.

Since the last ABET visit in 2005, the department has purchased over 30 computers using state equipment funds, and has received an equipment grant from Tektronix and the NMSU Budget committee for over $300,000. Significant educational discounts and grants have made it possible to obtain the latest computer hardware and software, particularly in the numbers needed for instruction. The department has a licensing agreement through the campus computer organization for Microsoft operating systems Windows XP, Vista, Windows 7 (32 and 64 bit), MS Office Professional 2010, MS Visual Studio 2010 (Visual Basic, Visual C, Visual Java, and others), and Sophos Antivirus This arrangement provides licensing for all departmental computers.

The following tables provide an inventory of the department's current computer hardware and software resources as they are applicable to the ECET Program. Appendix D provides a summary of campus-wide computer and software resources that are available to all NMSU students.

Computer facilities in Engineering Complex I and III. ECIII facilities are scheduled and maintained by the Department of Engineering Technology. ECI facilities are primarily used by the College of Engineering's computer based courses and are scheduled by Holly Ricketts for the College of Engineering. The ECIII computer lab facilities (EC1-210A and EC1-210B) are available for use by students outside of the scheduled lab times, during evenings and weekends.

Room No.	NAME	SIZE (Sq. ft.)
ECIII-234	ET Computer Applications Lab (25 computers)	894
ECIII-307	ET Computer Design & Simulation Lab (27 computers)	863
ECI-210A	College of Engr. Computer Lab (SolidWorks class – 25 computers)	950
ECI-210B	College of Engr. Computer Lab (SolidWorks class – 33 computers)	950
	Total	**3657**

Computer hardware and software by location:

Location	Quan	Description	Software
Administration, Technical Staff & Faculty			
Faculty Offices	14	Intel Core2 Duo 3.0GHz, 4GB RAM	Windows 7, MS Office 2010, Sophos Anti-Virus, Adobe Acrobat 9, Firefox 3
Department Office	4	Intel Core2 Duo 3.0GHz, 4GB RAM	Windows 7, MS Office 2010, Sophos Anti-Virus, Adobe Acrobat 9, Firefox 3
Other Staff Offices	2	Intel Core2 Duo 3.0GHz, 4GB RAM	Windows 7, MS Office 2010, Sophos Anti-Virus, Adobe Acrobat 9, Firefox 3
Student Organizations	2	Pentium4 - 2.6GHz, 2 GB RAM	Windows 7, MS Office Professional 2010, Sophos Anti-Virus, Adobe Reader, Do PDF, Firefox 3.6
Windows 2008 R2 Servers	3	Domain Controllers	Windows 2008 R2 Server, MS Office Professional 2010, Sophos Antivirus, Adobe Acrobat 9, PCounter, Altera, MultiSim, Mathcad, Matlab, Solidworks/Cosmos, Camworks,
Sun MicroSystems	2	Web Servers	Solaris 9, Apache Web Server
Departmental computer labs			
Computer Applications Lab	25	Pentium IV CPU-3.4GHZ, 2 Gb RAM	Windows 7, MS Office 2010, Sophos Anti-Virus, Adobe Reader 9, Firefox 3, Altera, Solidworks, Haested Methods, Autocad 2011, Primavera Project Manager,

Computer Design/Simulation Lab	20	Intel Core2 Duo 3.0GHz, 4GB RAM	Windows 7, MS Office 2010, Sophos Anti-Virus, Adobe Reader 9, Firefox 3, Altera, Solidworks, Haested Methods, Autocad 2011, Primavera Project Manager,
Other Departmental laboratories used by MET			
College of Engineering computer Labs			
Col. Of Engr. Computer Lab 210A	25	Intel Core2 Duo 2.4GHz, 2GB RAM	Windows 7, MS Office 2010, Sophos Anti-Virus, Adobe Reader 9, Firefox 3, Altera, Solidworks, Haested Methods, AutoCad 2011, Civil CD, Primavera Project Manager,
Col. Of Engr. Computer Lab 210B	33	Intel Core2 Duo 3.33GHz, 4GB RAM	Windows 7, MS Office 2010, Sophos Anti-Virus, Adobe Reader 9, Firefox 3, Altera, Solidworks, Haested Methods, AutoCad 2011, Civil 3D, Primavera Project Manager, Multisim, Labview

Student Computing Services provides services that support the University's stated mission of providing students, faculty and staff with the infrastructure and tools in pursuit of their educational and research endeavors. The NMSU Student Computing Services maintains more than 40 computer labs which are conveniently located throughout NMSU's campus; trained lab assistants monitor seven of these labs. These labs are equipped with Macintosh and Windows PC systems and software.

The Equipment Rental Program provides NMSU students, faculty and staff the means to rent a PC, laptop, projector and other media equipment by the day, week, month or semester.

University Wide Computer Labs: Hours & Locations

ICT Hallway Lab

ICT also maintains a Hallway Computer lab. This lab is located directly across from the Help Desk in the Computer Center.

Configuration: **10 Windows computers**

Hours**:** Opens Monday at 7 a.m., closes Saturday at 4 p.m. Sunday - Closed

Corbett Center Conroy Computer Cluster

Conroy Computer Cluster **in Corbett Center, was opened in 2000. This lab was funded by** President William Conroy and the ASNMSU student government. It is a 24/7 lab.
Configuration: 53 Windows computers, 5 Macs
Hours**:** **24/7**
Location: Corbett Center (second floor)

Knox Hall - NMSU ID Card Required for Access

The **Knox Hall lab** is located at the extreme west end of the campus in Knox Hall.
Configuration: 21 Windows computers, 2 Macs
Hours: Sunday - Thursday 8 a.m. - 10 p.m. Friday 8 a.m. - 10 p.m.
Saturday & Holidays Closed
Location: Knox Hall, Room 146 (west side of building)

Jacobs Hall 205/205B/205C

Jacobs Hall 205/205B/205C are among the largest computer labs on NMSU's campus.
Configuration: 59 Windows computers, 17 Macs
Hours: Monday - Thursday 8 a.m. - 12 a.m. Friday 8 a.m. - 10 p.m.
Saturday 8 a.m. - 10 p.m. Sunday 8 a.m. -12 a.m.
Location: Jacobs Hall 205/205C (second floor)

Jacobs Hall 204

Jacobs Hall 204 This lab is open for general student use.
Configuration: 25 Windows computers
Hours: Monday - Friday 9 a.m. to 9 p.m. Saturday - Sunday Closed
Location: Jacobs Hall 204 (second floor)

Vista del Monte (VDM) - NMSU ID Card Required for Access

Vista del Monte (VDM) lab is located in the Vista del Monte Community Center.
Configuration: 20 Windows computers
Hours: Sunday- Saturday 8 a.m. - 10 p.m.
Location: Vista del Monte Community Center (family housing complex)

C. Guidance

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

Certain equipment in the labs requires special instruction to protect the student from possible injury. The students are given instruction on the proper and safe way to use this equipment.

D. Maintenance and Upgrading of Facilities

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

The resources listed below have been more than adequate to purchase required lab equipment, to keep labs updated and maintained, and other required equipment used to enhance our teaching demonstrations.

- Department annual allocations
- Department I&G funds
- Support from regional government agencies
- Support from the construction industry
- Grants

This is a list of the equipment recently purchased specifically for the Civil ET program

Highway Capacity Software ($ 1,200, 2008, Department money)
Dynamic Penetration Cone ($1,800, 2009, department money)
Ground Penetration Radar ($45,000, 2008, research grant).

E. Library Services

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

Branson Hall and the Zuhl Library

The two library facilities, Branson Hall and Zuhl Library, are major and essential resources of the University. The University library's mission is to provide information resources and services that meet the needs of the faculty and students in the NMSU community and the citizens of New Mexico. The two libraries support the academic programs, as well as research and public service programs of the University

The Zuhl Library opened in 1992 as the New Library and was renamed as the Zuhl Library in 2000. Zuhl provides services and resources in the arts, education, humanities, and social sciences. Library administration is located in the Zuhl Library, as well as technical references, codes, and standards.

Branson Hall was the University's sole library facility prior to 1992. Branson provides services and resources in agriculture, business, government documents, science, and technology. The library's Southwest and Border Studies (archives, special collections), Collection Services, Bibliographic Services, Access Services, and Systems are also located in Branson Hall.

Total library space is now 233,000 square feet, currently configured for 1,190 seats (7.8% of the student body), 1.1 million volumes, 230 microcomputers and 30 terminals. Current technology includes a legacy library system as well as one fully equipped computer classroom, several servers, and LANs for network access.

Branson Hall and Zuhl Library are major academic resources for students and are heavily used, with 84.3% of the student body using one of the libraries for research and technical projects. The 27 library faculty and 51 staff provide students and faculty with access to information on how to use it effectively. Usage trends indicate declining demand for basic services like seating and copiers, and growing demand for complex services like reference services and electronic access. Demand for both printed and electronic information continues to grow. Searches of electronic resources, use of databases, requests for instruction and training, and demand for library courses and reference service are all on the increase as users seek to master new technologies.

F. Overall Comments on Facilities

Describe how the program ensures the facilities, tools and equipment used in the program are safe for their intended purposes (See the 2011-2012 APPM II.G.6.b.(1)).

An important aspect to all laboratory class room use is lab safety. All students are advised of proper safety issues when they first attend a class and lab. A lab safety sheet is handed out to all students when they receive the syllabus for a class. An example of a Lab Safety Handout provided to all students at the beginning of each semester follows.

DEPARTMENT OF ENGINEERING TECHNOLOGY
LAB SAFETY - Spring 2011

This laboratory will be conducted in accordance with the following list of regulations, procedures and comments in order to promote a professional and safe approach to the laboratory experience. Additional lab safety rules may apply during specific lab experiments. Do not hesitate to ask the lab instructor for assistance if you are not sure of the proper operation of any piece of equipment or a lab procedure that might compromise safety.

1. No smoking, food, drink or horseplay permitted in the lab.
2. Haste cause accidents. Work deliberately and carefully.
3. Do not use damaged or poorly insulated wires or equipment.
4. Use only the equipment specified.
5. Properly ground all equipment.
6. Double-check all connections before applying power.
7. Turn the power off when making changes to your experiment.
8. Discharge capacitors by shorting with a resistor.
9. Report any accident to the instructor.
10. Wear the proper clothing for the specified lab.
11. Keep your work area organized and clean.
12. Caution - wet hands make you susceptible to electrical shock.
13. Caution - 120 volts is on an AC outlet.
14. In the event of a power failure, turn the equipment off and wait for further instructions.
15. Do not energize equipment until given permission.
16. Do not place personal belongings (books, coats, etc.) on laboratory equipment.
17. Do not stand on a wet floor when energizing or de-energizing electrical equipment.

Material Safety Data Sheets

The Department of Engineering Technology has information concerning hazardous materials posted on the bulletin board inside the Engineering Technology main office (Goddard Hall, Room 107). The Material Safety Data Sheets (MSDS) have been posted in accordance with the Hazardous Materials Communication Program. Please check the MSDS sheets if you have any questions concerning the handling or use of any materials utilized in the class or the lab. You will be asked to sign that you have read this safety sheet and are aware of the Hazardous Materials Communication Program.

CRITERION 8. INSTITUTIONAL SUPPORT

A. Leadership

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

The department head for Engineering Technology and Surveying Engineering is Dr. Jeff Beasley. Dr. Beasley has been teaching with the department since 1988 and has been the department head since July 1, 2010. The associate department head is Professor Lynn Kelly. She has been teaching with the department since 1998 and has been the associate department head since 2007.

The department head has regular meetings with the coordinators and the faculty to make sure the quality of the academic programs is being maintained. These meetings are conducted with individual members, with coordinators, and with the entire faculty. In these meetings, all aspects of the program are examined and evaluated to make sure of the following:

- Proper course selection
- Updates to student advising documents
- Updates to degree check information
- Recommendation for upgrades to laboratory facilities
- Recommendation for upgrades to computer facilities including both software and hardware upgrades

In addition, these regular meeting provide opportunities to make sure faculty are advancing towards promotion and tenure, that they are involved in quality teaching and advising, creative and scholarly activity, service, and extension and outreach.

<u>Department Head Responsibilities</u>

The department head is expected to be the academic leader of the departmental faculty. He is responsible for ensuring that highly qualified faculty are employed and work closely with the faculty on the development and sustenance of departmental courses and the stimulation and encouragement of faculty development.

The department head is responsible for encouraging the national and international professional contacts of the faculty within the constraints of the departmental budget. This implies appropriate travel and bringing well-known professionals to the campus.

The department head has no more important task than ensuring teaching excellence. Encouragement and support of good teaching is given to faculty. The department head is responsible for ensuring an effective departmental evaluation of teaching, and for advisement of student departmental majors. He keeps the faculty fully informed of department, college, and university matters. Routine and special reports, including grade

reports and other matters, must be handled accurately and on time. Effective supervision and development of the department budget is important. The department head will keep the faculty informed on budgetary matters.

The department head is expected to be an advocate of the department, yet at the same time appreciate the concerns and priorities of the college and university. The department head, the coordinators, and the faculty are involved in overseeing that course selection for each semester addressing the specific needs of all four engineering technology programs offered through our program.

The department head is responsible for overseeing the daily operations of the department which include managing all aspects of the academic program, overseeing the department budget, overseeing classroom teaching assignments, ensuring pre-requisite requirements

Associate Department Head Responsibilities
Fill in when necessary for Department head
Schedule – create the spring, fall & summer catalog proofs
Update changes in the university's catalog for Engineering Technology
Update course descriptions
Coordinate the request for student evaluations each semester
Responsibility for semester updating of the ETSE database updates
Recruitment development and keeper of brochures
Coordination of the equipment budget money provided through the university

B. **Program Budget and Financial Support**

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

   The main departmental operating budget and the allocation for funded faculty teaching positions is controlled by the university's budget office. A summary of the budget allocated for the department since 2005-2006 is provided in Table 8-1.

   Table 8-1 Department Operating Budget 2005-2006 to 2010-2011

2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011
$55,660	$49,819	$49,819	$54,346	$53,754	$60,637

   The department's operating budget has remained at the same level for the previous five years. In 2010, the operating budget for Surveying Engineering was moved into the overall ETSE budget. This explains the increase for 2010-2011. The university has made some budget cuts in response to the state's financial situation but the department's budget has not suffered from a major cut.

The university does provide for an allocation of money for software and hardware purchases. The dollars amounts provided for years 2005-2006 to 2010-2011 are provided in Table 8-2. A detailed list of purchases for the same years follows.

Table 8-2 Department Software/Equipment Fee funds 2006-2007 to 2010-2011

2006-2007	2007-2008	2008-2009	2009-2010	2010-2011
$71,414	$77,071	$37,511	$50,022	$37,362

2006-2007 – Equipment Purchases

Date	Equipment Type	Faculty	Total
2/13/07	Weather station & pole Weather station & RCVR	Tom Jenkins	$2343.20
2/21/07	Wind Generator	Tom Jenkins	$1050.00
4/30/07	Xantrex Prisne 2000 Watt Sine Wave Inverter	Tom Jenkins	$1595.00
5/01/07	Fluke 43B Analyzer	Tom Jenkins	$2099.00
5/3/07	Notebook Laptop	Michael Morrell	$2599.99
5/10/07	Epson – LCD Projector	Holly Ricketts	$1349.00
5/18/07	3-phase power converter	Craig Ricketts	$1005.00
5/18/07	Volume controllers	Craig Ricketts	$2600.00
5/31/07	Variable frequency drive	Craig Ricketts	$13,152.90
6/5/07	Reverse stress load cell	Kenny Stevens	$6790.00
6/05/07	Wind tunnels	Craig Ricketts	$5220.00
6/20/07	Rotational Viscometers	Craig Ricketts	$3690.00
6/25/07	Spectrum Analyzer	Jeff Beasley	$2947.50
7/18/07	Adven Pro Precision Balance	Sonya Cooper	$2241.00
8/7/06	Materials for lathe	Charlie Park	$1482.50
8/30/06	Computer	R. Jiang	$1452.32
12/4/06	Computer	Carmen Boje	$1625.73
2/01/07	Computers (12)	Surveying Lab	$16,552.56
2/6/07	HP Large Formatt Plotter	Surveying Dept.	$4396.10
2/6/07	HP Laserjet printer	Surveying Dept.	$1678.06

2006/2007 Software/Student Maintenance

Date	Equipment Type	Faculty	Total
2/27/07	Vernier Software	ET 381 – T. Jenkins	$334.00
3//8/07	Software – Upgrade Multisim Ver. 10	Holly Ricketts	$2759.00
5//10/07	LCD Projector Accessories	Holly Ricketts	$1789.00
6/22/07	Software – Solid Works	Holly Ricketts	$2500.00

2007-2008 – Equipment Purchases

Date	Equipment Type	Faculty	Total
10/26/2007	Balance	Kenny Stevens	$2393.00
11/27/2007	Digital Readout	Charlie Park	$4048.00
12/7/2007	Computer	Holly Ricketts	$1257.90
12/11/2007	Power supplies	Holly Ricketts	$6500.00
1/22/2008	Computers (29)	Holly Ricketts	$36,131.39
3/20/08	Adapters	Jeff Beasley	$4310.26
6/12/08	Computers (2)	Sonya & Carol &Lupe	$4066.80

2007-2008 – Software/Student Maintenance – Index 100527

Date	Equipment Type	Faculty	Total
12/28/2007	Lab supplies	Craig Ricketts	$1379.00
12/19/2007	Lab supplies	Craig Ricketts	$1126.00
1/15/2008	Lab supplies	Craig Ricketts	$138.00
1/10/2008	Hand held GPS receivers	Surveying	$759.12
1/09/2008	HAP Package	Craig` Ricketts	$299.00
2/13/08	Lab chairs	Holly	$9259.60
4/4/2008	Software update Circuit CAM	Chris Wise	$1596.00
6/11/2008	Lab equipment	Craig Ricketts	$2252.64
6/11/2008	lab supplies ET 306	Craig Ricketts	$34.20
6/12/2008	Lab equipment	Craig Ricketts	$1521.00

2008 - 2009 – Equipment Purchases

Date	Equipment Type	Faculty	Total
2/5/09	Bench top system	Jeff Beasley	$2695.00
2/13/09	Computer	Elena Fernandez	$1518.64
3/9/09	Surveying Equipment	Steve Frank	$7224.00
3/31/09	Laptop	Sonya Cooper	$1058.65

2008 – 2009 – Software/Student Maintenance Index – 100527

7/2/08	CamWorks Renewal	Holly Ricketts	$1125.00
1/27/2009	Education Kit	Lynn Kelly	$2970.00
2/11/09	Software/Multisim	Jeff Beasley	$3888.00
2/27/09	Cadets – 16	Holly Ricketts	$6156.00
3/2/09	Sigmaplot license (13)	Craig Ricketts	$2145.00
5/12/09	Software	Lynn Kelly	$116.00
5/21/09	Software/Adobe Systems	Holly Ricketts	$299.08
5/15/09	Software/VMWare	Holly Ricketts	$1028.00
4/1/09	Notebook	Steve Frank	$299.98
5/21/09	Software	Michael Morrell	$338.98
5/21/09	Solid Works/Maint. Renewal	Holly Ricketts	$1250.00
6/20/09	Hard Drive	Holly Ricketts	$145.99
6/24/09	Computers	Holly & Lynn	$2040.80
7/8/2008	Desk top 3D Scanner	Charlie Parks	$2318.00
7/15/08	Lab supplies	Craig Ricketts	$389.00
6/6/09	M-CAD Stand alone software	Chris Wise	$315.00
2/9/09	Macrolite Ceramic spheres	Kenny Stevens	$190.01

2009 – 2010 Equipment Purchases

Date	Equipment Type	Faculty	Total
2/3/2010	Rectillinear Mass/Spring/Dapmer Mass Encoder	Manny Gomez	$11,800.00
1/19/10	Computers (networking Lab)	Jeff Beasley	$2485.44
2/4/10	Sprinter 150M	Steve Frank	$1565.00

2009 – 2010 Software/Student Maintenance

Date	Equipment Type	Faculty	Total
7/28/09	Computers Student labs	Holly Ricketts	$18,114.00
11/16/09	Surveying Lab supplies	Kurt Wurm	$2431.62
11/25/09	laptop – ET Dept. checkout	Holly Ricketts	$888.00
11/25/09	Computer work station	Holly Ricketts	$949.00
12/2/09	Lab Equipment	Steve Frank	$503.00
12/10/09	Lab instruments	Jeff Beasley	$2250.00
1/11/10	Software	Kenny Stevens	$264.00
1/16/10	Monitors -242 lab	Michael Morrell	$318.00
1/21/10	Laptop computer Check out to students	Holly Ricketts	$948.00
1/18/10	Computer	Michael Morrell	$609.00
1/20/10	Memory for lap top	Holly Ricketts	$98.98
1/16/10	Hard-drive	Michael Morrell	$134.99
1/27/10	Oscilloscope Probes	Holly Ricketts	$283.90
1/27/10	Computer -242 lab	Holly Ricketts	$529.00
1/18/10	Lab supplies (civil labs)	Kenny Stevens	$186.11
1/26/10	GPS system	Earl Burkholder	$91.92
2/2/10	Computer – Student study lounge	Holly Ricketts	$599.00
2/3/10	Lab equipment ET 378,308L,381L,422L	Chris Wise	$1351.00
2/12/10	Lab equipment ET 426 & 320	Manny Gomez	$59.00
2/9/10	Software license	Craig Ricketts	$128.00
2/19/10	Lab equipment ET 246,328	Manny Gomez	$829.00
2/19/10	In design Mac License	Lynn Kelly	$200.88

2/26/10	Lab equipment ET 322	Sonya Cooper	$499.00
3/6/10	Lab equipment ET 246	Manny Gomez	$169.00
3/10/10	Lab equipment –GPS equip.	E. Burkholder	$215.99
3/4/10	Electronic boards –labs	Craig Ricketts	$1331.45
4/21/10	Software	Michael Morrell	$106.37
5/04/10	Software	Holly Ricketts	$83.93

2010 – 2011 Software/Student Maintenance

2/23/11	Lab Chairs	Holly Ricketts	$4,706.95
2/24/11	Computers	Holly Ricketts	$3,295.00
2/20/11	Lab Supplies	Craig Ricketts	$124.00

The department also has the opportunity to submit request for special funds. This requires that faculty members submit a proposal to the university or to an outside funding agency for funds to be used for support a program. Since 2005, the department has received special funds in the amount of to support the following programs.

2010 - Distance Education Classrooms $103,000

2010 – 2011 – Lynn Kelly – Special Equipment –

Date	Equipment Type	Faculty	Total
11/8/10	Dell Optiplex 980 Desktops	Lynn Kelly	$9,865.35
11/19/10	Document Reader (3)	Lynn Kelly	$5,025.00
12/1/10	Multimedia Podium	Lynn Kelly	$3449.00
12/1/10	Smart Boards	Lynn Kelly	$13,025.97
12/16/10	Wireless Microphones	Lynn Kelly	$5997.00

2007 – ECIII 250 Laboratory Development $203,623

2007/2008 – Special Equipment – Tektronix – Tom Jenkins

Date	Equipment Type	Faculty	Total
10/9/2007	Fluke 8846A	Tom Jenkins	$20,925.00
11/15/2007	Oscilliscopes & Generator	Tom Jenkins	$124,992.40
1/1/2008	Computers (19)	Tom Jenkins	$26,854.60
1/10/2008	Strain indicator & recorders	Tom Jenkins	$21,000.00
2/7/2008	Epson projector & ceiling mount	Tom Jenkins	$3,766.00
3/12/2008	Laser jet printer	Tom Jenkins	$1878.75

2008 – 2009 Special Equipment – Tektronix – Tom Jenkins

7/2/08	Plotter	Holly Ricketts	$3153.38
7/3/08	Color Printer	Holly Ricketts	$1055.00

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

   It is the philosophy of the department for the instructor of a class to be responsible for all class grading. The only exception to this rule is when a class has an abnormally large enrollment.

   The faculty in the Engineering Technology and Surveying Engineering department take a lot of pride in our ability to deliver excellent classroom and laboratory instruction. Our faculty do their own grading. They feel this provides a better way for the instructor to fully understand how well difficult concepts are being understood by the students. In this way, changes in classroom instruction can be modified to make sure the students are mastering the topics.

   At this time, the department does not have any teaching assistants assigned to any classes or labs.

Teaching Academy

The Teaching Academy supports teachers, enhances learning, and builds community for NMSU educators through training, mentoring, and networking. The Teaching Academy offers:

- Workshops
- Classroom observations
- IDEA course evaluations
- Scholarships to teaching conferences
- Short courses (Teaching Scholars, Peer Coaching, Team Mentoring, Publish & Flourish, and Writing Groups)

The Teaching Academy reaches faculty and staff through 8,000 hours of training per year. At NMSU, 50% of faculty on the Las Cruces and Doña Ana campuses participate in at least one Teaching Academy event each year. Graduate students and staff members also participate, bringing the total number served each year to more than 700.

- Make Teaching Academy events more readily available to community campuses via videostreaming.
- Establish a Teaching Expo that features teaching innovations and scholarship of teaching and learning.
- Work to establish a working group of faculty on the scholarship of teaching and learning.
- Ensure that guidelines are written for all teaching awards on campus.
- Ensure that teaching and learning are more explicitly included in the next Living the Vision statement.

The ADVANCE Program

Housed within the Teaching Academy, the ADVANCE Program serves all faculty, especially underrepresented faculty, through training, mentoring, and networking to enhance diversity and build community at NMSU. ADVANCE has the following initiatives:

- ADVANCing Leaders Program
- ADVANCE Mentoring Program
- Promotion and Tenure (P&T) Workshops
- Department Head Training**Faculty, Staff, and Students**

- Provide up to seven Department Head Trainings per year.
- Host two P&T workshops to 50 participants per event.
- Recruit twelve participants for ADVANCing Leaders drawn from all colleges.
- Host six ADVANCE Mentoring events per year and expand to the College of Education.

- Maintain targets for Department Head trainings, P&T programs, and ADVANCing
- Leaders.
- Host six ADVANCE Mentoring events per year and expand to the College of Health and Social Services.

- Maintain targets for Department Head Training, P&T programs, and ADVANCing
- Leaders.
- Host six ADVANCE Mentoring events per year and expand to the College of Business and the Library.

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

The department has a small operating budget that is used to maintain existing equipment used by the programs. However, even with the limited operating budget, the department is able to do the following;

- maintain a copy machine and a maintenance contract to keep the machine functioning.
- Purchase laboratory parts and supplies as needed to support the programs in the department.
- Purchase equipment and software - as described in 8-B Program Budget and Financial Support and previously listed in Table 8-1 and Table 8-2, and this has made it possible for the department maintain and upgrade facilities as required. The

department's operating budget has remained at the same level for the previous five years.

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

The department provides the faculty with the financial support to obtain the necessary materials to ensure that the student outcomes are met. The faculty continually updates their laboratory exercises and they make sure that the equipment used in the labs adequately addresses the needs of the lab exercises. The faculty are actively involved with professional development (see section 6-D) so that they are aware of the best techniques to present course topics. The classrooms provided for instruction are of adequate size and are properly equipped for a proper learning environment. The physical size of each of the laboratories is of a proper size so that instruction is both safe and conducive to learning.

C. Staffing

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

The department of Engineering Technology and Surveying Engineering currently has 13 faculty. These faculty provide academic departmental support for five on-campus programs and one distance education Information and Communication Technology (non-ABET) program. The breakdown for the on campus programs is listed below.

CET Program	MET Program	ECET Program	IET Program	Surveying
Sonya Cooper	Craig Ricketts	Lynn Kelly	Michael Morrell	Steve Frank
Kenny Stevens	Anthony Hyde	Tom Jenkins	Lynn Kelly	Kurt Wurm
Ruinian Jiang	Manny Gomez	Michael Morrell	Carmen Boje	(new faculty)
		Carmen Boje	Jeff Beasley	
		Jeff Beasley		

Department Staff

Jeff Beasey	Department Head
Carol Serna	Department Secretary
Holly Ricketts	IT Support
Chris Wise	Staff Engineer

The steps we take to support Faculty Professional Development are outlined in section 8-E. The steps we take for retraining our staff are to support their need and interests in continuing education related to their job. This involves attending seminars, conferences, workshops, and personal interactions with workers who hold similar jobs. The following is a list of some of the continuing education and training activities staff have participated in since 2006.

We provide a nice work environment so that staff are encouraged and want to remain on the job. Training activities are provided as needed for the staff.

D. Faculty Hiring and Retention

1. Describe the process for hiring of new faculty.

The guidelines for hiring of new faculty are specified in the university's Search Committee Handbook that can be downloaded from the following web address.

http://hr.nmsu.edu/managers/search_handbook.html

The handbook specifies the criteria to be followed for all of the people associated with a faculty search. This includes the formation of the search committee, responsibilities of the department head, the dean, and the provost.

Recruitment

The first step of the search process is to authorize the position. The employing Department Head/Administrator/Division Dean, or designee is responsible for completing the appropriate section of the EAF and forwarding the proposed position announcement and copy of the proposed media advertisement to the Personnel Office for review before any distributions are made. One copy of the final approved announcement and advertisement(s) will be forwarded to the Personnel Office electronically or in hard copy. The Personnel Office will be responsible for any internal postings. Approved newspaper/journal advertisements are processed by the hiring department by purchase order (through Purchasing) directly to the vendor. The position announcement must set forth position requirements to include minimum qualifications, duties, and responsibilities. The information contained in the announcement should be general to attract a diverse pool, yet specific to meet the needs of the employer. The qualifications required should be clearly stated in the position announcement. It is important that the position announcement clearly distinguishes between required and desired/preferred qualifications. It is inappropriate to change the qualifications after the advertisement is published to deselect or give unfair advantage to any candidate.

Screening the Applicants

Step One.....Receiving and Responding to Applicants/ Candidates

It is important that a log be maintained to record all incoming applications by date received, name of candidate, list of attachments, and acknowledgment date. All candidates are to be notified (in writing) of the status of their application within 30 days of the closing date (or for on-going reviews, use the first review date or receipt of application date). The letter of acknowledgment should include:

(1) A statement listing specific materials received;
(2) *APPLICANT FLOW RECORD* form (see Appendix 4);
(3) Information about the process and timetable;
(4) A copy of the position announcement, if deemed necessary; and,
(5) A request for any additional information needed.

Step Two.....First Screening
The purpose of the initial screening is to determine if applicants meet minimum requirements listed in the advertisement and to eliminate applicants who have not submitted the required application materials

Once the closing date has arrived, all required documents (i.e., letter of transmittal, resume, transcripts, letters of recommendation) will be checked by the Search Committee. If candidates have not submitted all the required documents by the closing date, further consideration should cease. There may be occasions when the Search Committee may inform candidates of missing reference letters and allow additional time. If all requested materials have been received and the candidate meets minimum qualifications necessary for the position, the applicant has passed the first screening. Similarly, if the applicant does not meet minimum qualifications, s/he did not pass the first screening. Applicants who fail to pass the first screening should be notified as soon as possible (H & H p. 48). Appropriate reasons for deselection should also be completed on the *APPLICATION SCREENING RECORD*

Step Three.....Second Screening
The second screening should be more qualitative than the first screening. During the second screening, the Search Committee examines the material submitted by candidates with great care and assesses the degree to which the candidate has met or exceeded the criteria established by the committee. The criteria evaluated is derived from the position announcement and other criteria deemed important by the committee (H&H p.49). On occasion, the Search Committee may wish to further screen qualifications by telephone conference calls prior to establishing finalist list and/or rendering recommendations.

Step Four.....Third Screening
The Search Committee will recommend a minimum of two **unranked** qualified finalists for faculty positions (three for administrative positions) to the Department Head/Administrator/Division Dean. Careful consideration should be extended to include qualified women and minority candidates in the pool of finalists consistent with Affirmative Action goals, contingent upon ensuring that other applicants are not discriminated against. It is important to mention that the committee may forward strengths and weaknesses on each finalist, but the final decision on individuals to be interviewed rests with the Department Head/Administrator/Division Dean. Every effort should be made to notify each candidate of the status of his/her application throughout the search process. If it is clear that the candidate does not meet minimum qualifications, issue a letter of notification to avoid unnecessary duress and thank the applicant for their interest in the position. Email and Postcards are neither confidential, nor an appropriate

way to notify candidates of the status of their application. Do not send deselection letters to candidates who may subsequently become viable finalists on the occasion that the successful candidate(s) may decline or withdraw their application(s).

INTERVIEW PROCESSES

There are several different methods for interviewing. Applicants have the right to expect that applications will be judged against stated measures, namely the requirements of the job, position description and position qualifications. The interview procedure should be designed to assure not only that all applicants are treated equitably, but also that they perceive they have been so treated (H & H pp. 56-57).

The atmosphere surrounding the interview process should encourage candidates and hosts alike to explore the competencies of the other. The process should be organized, friendly, and businesslike. Interviewing (and the immediate follow-up) gives the Search Committee the opportunity to see its work come to completion. However, it also may be a time of great disappointment. A candidate may not seem nearly as attractive when present on campus, or the university may not appear attractive to the candidate.
There may also be occasions when a person of authority may decide not to approve a candidate for interview for legitimate reasons. It is conceivable that a Dean/Executive/Vice President/Vice Provost/Campus Executive Officer may not agree to interview a candidate, or that a Department Head/Administrator/Division Dean may not approve the Search Committee' s recommendations and want to see additional candidates. These possibilities make it vital that persons who have approval authority over the interview of candidates be consulted concerning the suitability of candidates ***before*** an invitation to interview. Through the interviewing process, the following information can be obtained:

1. The candidate's communication skills, personality traits, thinking habits and motivation;
2. Extent of the candidate’s interest in the position;
3. Information that may not otherwise be obtained;
4. A candidate' s academic, research or administrative abilities and interests;
5. The candidate's reactions, attitudes, or philosophy towards issues (H & H p.59); or,
6. Perspectives on diversity and the candidate’s ability to work with persons of different backgrounds,
ethnicities, and other diverse populations.

Making the Offer

Eligibility for tenure and retreat rights to an academic department must be established prior to making an offer. The receiving department must be contacted and the department’s Promotion and Tenure Committee needs to establish rank and eligibility for

tenure of the candidate. When the Dean/Executive/Vice President/Vice Provost/Campus Executive Officer has made a decision to offer, the Permission to Offer section of the *EMPLOYMENT AUTHORIZATION FORM* is completed with the recommended salary, completed *APPLICATION SCREENING RECORD,* and signed *CANDIDATE RELEASE FORM.*) A memorandum of justification may be required if the position is underutilized or extenuating circumstances call for exception. ***Do not extend any offer prior to official approval from the Provost.***

The Dean/Executive/Vice President/Vice Provost/Campus Executive Officer is authorized to extend all official position offers to the candidate selected after receiving approval from the Provost. Negotiation factors such as salary, rank, moving expenses and any contingencies (experience credited towards tenure, transcripts, and visa documents) are to be cleared in advance in writing. The Dean/Executive/Vice President/Vice Provost/Campus Executive Officer must keep in mind that s/he is part of the process of creating a legally binding agreement between the institution and the individual. The terms and conditions of employment are to be discussed thoroughly to avoid any misunderstanding on the offer. All letters of offer are to be signed by the respective Dean/Executive/Vice President/Vice Provost/Campus Executive Officer. The verbal offer may be delegated to the Department Head/Administrator/Division Dean.

Some candidates will accept an offer at the time extended. Others will ask for a week or two to decide, citing the need to discuss the matter with a spouse and consider local living conditions. Occasionally, a candidate will ask for an unusually long period in which to consider the offer. If this occurs, there should be a specific deadline given in writing. If the candidate has not replied by the deadline date, s/he should be sent a letter informing him/her that the offer is rescinded. If a candidate refuses the offer or does not reply within the agreed-upon time frame, the second candidate on the list should be contacted only after a second Permission to Offer is cleared. This should continue until a candidate has accepted the offer. ***(It is important that other finalists for the position not be notified until a written offer is accepted.)*** If there are no other suitable candidates, the search may be: a) extended; b) cancelled and initiated at a later date; or tabled pending deliberations with the Provost, Dean/Executive/Vice President/Vice Provost/Campus Executive Officer, Department Head/Administrator/Division Dean, and Personnel Director (or appropriate designates). All withdrawals or declined offers should be documented. There are many reasons for extending the offer in writing. Offer letters can be used to avoid misunderstandings, outline the nature and functions of the position, terms and conditions of employment are specified, and may offer new employees a sense of certainty and permission to extend current employer notice (Appendix 16). As with any written document, there are reasons to exercise certain precautions to avoid litigation.

2. Describe strategies used to retain current qualified faculty.

We are try to provide a nice work environment so that faculty are encouraged to remain on the job. We encourage faculty to develop areas in our programs that are of specific interest to them. For example, in the CET program each of our three faculty members have specific programs that they are closely attached to. For example, Prof. Kenny Stevens is strongly interested in supporting student organizations. Examples of his work include work with the concrete canoe team and traveling internationally with Engineers Without Borders. On top of this, Prof. Stevens excels as an instructor having won the "Donald Roush" award twice for Excellence in Teaching. Dr. Cooper is also a strong advocate of student organizations, also participating with Engineers Without Borders, the faculty representative for student bidding competitions, and involving students in her work with historic preservation. Dr. Jiang has interests in the area of Intelligent Transportation Systems and further developing international exchanges with China.

The fact that the faculty get to work on these other areas that are of great importance to them helps to make the work environment much more enjoyable and as a result the faculty want to continue working in our program.

E. Support of Faculty Professional Development

Describe the adequacy of support for faculty professional development and how activities such as sabbaticals, travel, workshops, seminars, etc., are planned and supported. (Note: Refer back to section 6-D Professional Development for more supporting information.)

Due to our limited time available for professional development compared to other responsibilities, we appreciate professional development that is well-planned, and is efficiently delivered. In the past, our faculty members have identified professional development areas and attended to their respective needs on an individual basis. This has worked well given the history of activities identified collectively. There is a need, however, to document and assess the success of professional development in the form of a 'plan'.

We have identified the following development areas based on these plans, in conjunction with our educational objectives and program outcomes, and promotion and tenure guidelines. They are labeled A-K below. We then identified avenues to accomplish A-K. These are labeled 1-14 below. We also extracted the development areas and categorized them according to full, associate, and assistant professors. This exercise was useful to evaluate the overall importance of the development area to faculty member rank.

Due to all the responsibilities a faculty member has to juggle, time devoted to professional development hours is limited, and given low priority compared to other responsibilities. History shows that the department spends on average $6-$7,000 per year for professional development. In order to establish a baseline of expected dollars required for sufficient professional development, we use the New Mexico State Board of

Licensure for Professional Engineers and Surveyors requirement for professional development as an example. The minimum requirement to maintain professional registration is 30 Professional Development Hours (PDHs) for two years. This equates to approximately $1,500 per faculty member, per year, for various combinations of the below avenues. The department goal is to match half of that requirement. For 12 faculty members, this corresponds to $9,000 per year or $750 per faculty member. Because conferences cost approximately $1500, an appropriate approach is to fund 6 faculty members every year.

Development Areas

A. Knowledge of the continuous improvement process and how to implement
B. Need to stay current in specialty areas
C. Need to be recognized by peers nationally and internationally
D. Need to exercise our desire to learn from other disciplines
E. Additional requirements for promotion to associate professor and for tenure
F. Additional requirements for promotion to full professor process
G. Need for teaching improvements and effectiveness
H. Need to implement new teaching methods
I. Need to update class and lab resources
J. Need for leadership in community and NMSU administrative decisions
K. Need for preparedness to assume upper level administration positions

The following have been identified as means for accomplishing A-K above.

Avenues to Accomplish Development Area	**Approximate Areas Cost Per Event**
1. ABET Evaluator Training	$100 if included in a conference
2. Professional Registration	$75
3. Higher Degrees – per semester paid	$0 (1 course paid by the university)
4.College Classes	$0 (1 course paid by the university)
5. Short Courses – continuing education classes	$1,200
6. Seminars and workshops	$0 - $500
7. Sabbaticals	$0
8. Conferences and Travel	$1,500
9. Professional Organizations and Journals, software	$200/year
10. Collaboration	$0
11. Research, Publishing	$0
12. Grant proposal writing	$0
13. Review of Textbooks, publications, and proposals	$0
14. Reviewing/revising codes and standards	$0

Mapping of Development Area to Faculty Member Rank

Development area	Full Professor (4)	Associate Professor (5)	Assistant Professor (2)
A	X	X	X
B	X	X	X
C	X	X	
D	X	X	X
E			X
F		X	
G	X	X	X
H	X	X	X
I	X	X	X
J	X	X	
K	X	X	

Criterion 9. PROGRAM CRITERIA

Describe how the program satisfies any applicable program criteria. If already covered elsewhere in the Self-Study Report, provide appropriate references.

The Mechanical Engineering Technology program criterion is embedded in Criterion 3 and Criterion 4 explicitly. Please refer to pages 37-55.

APPENDICES

Appendix A – Course Syllabi

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

1. Course number and name

2. Credits and contact hours

3. Instructor's or course coordinator's name

4. Text book, title, author and year
    a. other supplemental materials

5. Specific course information
    a. brief description of the content of the course (Catalog Description)
    b. prerequisites or co-requisites
    c. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program

6. Specific goals for the course
    a. specific outcomes of instruction, ex. The student will be able to explain the significance of current research about a particular topic.
    b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

7. Brief list of topics to be covered

Engineering Technology – All Options

Course Number and name: ET 101 Introduction to Engineering Technology

Credits & Contact Hours: 1cr. each week, 1 lecture of 50 min

Instructor's name: Dr. Jeff Beasley

Textbook title, author, and year: None required

Specific Course Information:

a. **Course Catalog Description –** The development of engineering technology, with an introduction to engineering technology, education, and practice. Graded S/U. .
b. **Prerequisite –** none
c. This course is required for all CET, MET, ECET, and IET degrees

Course Goals & Objectives:

- Assist in making a successful transition to college
- Encourage students to develop a strong interest in learning and to become active participants in the educational process
- Provide information to assist each student in making the best decision on his/her educational and career choices
- Provide students with the information, tools and knowledge needed to make use of the library, computer facilities, tutoring and other campus resources and services available.
- Provide an environment for good interaction and mutual support among other students and faculty/staff
- Encourage students to establish a mentor relationship with someone who can help with their academic goals
- Encourage students to become part of a community of fellow learners.
- Encourage students to recognize and appreciate cultural diversity

COURSE REQUIREMENTS:

Resume and Cover letter: Prepare a resume and cover letter based on instructions given in class.

Autobiography: Write a minimum 250-word autobiography describing your reasons and motivations for attending college and specifically, why you are interested in Engineering Technology. Include some short term goals and long term goals.

Join a Campus Club or Organization: Attend a minimum of two meetings. Write a 1-1 ½ page paper about your experiences in the organization, your perception of yourself and others in the organization, and how being in the organization has influenced you. Go to the NMSU Student Organization Web Page to see what is available and call 646-3200 to receive information regarding the contact people and meeting dates. The web address is http://ccsu.nmsu.edu/soap.

Campus Cultural Activities: Attend a cultural event with a class member (e.g. theater, symphony, sporting event, choir, lecture, book reading, preservation workshop, etc.). Select activities you do not normally attend. Submit a 1-page reaction paper describing what you attended, how you felt about it and what you learned about yourself by attending this activity. Be as specific as possible about your feelings.

Library Research: Complete the library research exercise. Specific instructions will be given before this is assigned.

Team Projects: You will be given 2 interdisciplinary engineering design projects that you will work on with a team of your peers. Requirements TBA.

Course topics and lecture hours devoted to each topic:

TOPICS	**HRS.**
Introduction	1
Prepare a "memo" that discusses the following What do you like to do? What are you good at doing? What do you hope to do for a career? What do you need to do to get there?	1
Lego project – in class	1
Discuss the career fair.	1
NO CLASS – go to the Career Fair – Corbett Center Ballroom	
Report on career fair (report to the class on your visit. Focus on one company.	1
Project #1 overview – *The Portable Power for a Laptop Computer Challenge* This is a team project and there is a limit of 3 people per group.	1
Project #1 – cont. Memo to the Boss #1 due	1
Project #1 – cont. Memo to the Boss #2 due	1
Project #1 Presentations	1
Project #2 ET 101 Project #2- Title- My IPOD Improved My life at NMSU. Students will given a choice to either design a I-pod, I-phone Application or I-Pad(APP) or create a mechanical device or accessory used for an I-pod, I-phone or I-pad. Students will describe a problem or challenge they are faced with at NMSU or as freshman student and see how they could use an I-phone or I-Pod or I-Pad to assist in helping with this problem. Students will be required to describe, illustrate. Flowchart and/or demonstrate or prototype their design.	1
Project #2 – cont.	1
Project #2 – cont.	1
Project #2 Presentations	1

Prepared by: Jeff Beasley **Date: 10/7/10**

Course number and name ET 110 Introduction to Computer-Aided Drafting and Design

Credits and contact hours 3cr Course. Contact hours by appointment

Instructor's or course coordinator's name Eduardo M. Gamillo

Text book, title, author and year Engineering Design and Graphics with SolidWorks, James D. Bethune, 2010

a. other supplemental materials SlolidWorks 2010 Software

Specific course information

a. **brief description of the content of the course (Catalog Description)** E T 110. Introduction to Computer-Aided Drafting and Design 3 cr. Introduction to computer-aided drafting and design using 3-D solid modeling software

b. **prerequisites or co-requisites** none

c. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program **Required**

Specific goals for the course

a. specific outcomes of instruction, ex. The student will be able to explain the significance of current research about a particular topic.

Students will learn the fundamentals of part modeling and assemblies using modeling techniques in the SolidWorks solid modeling software. They will learn how to put these parts and assemblies into production drawings using proper Geometric Dimensioning.

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

Course Objectives:
• Knowledge of properly operating a CAD system in the most efficient manner
• Ability to generate and easily update Part models
• Ability to create assembly models
• Ability to create usable production drawings from 3-D CAD models
• Ability to work in a group and operate effectively on a team
• Ability to use creative and technical thinking skills and design

Brief list of topics to be covered

Week 1 (Aug 20) – SolidWorks Intro
Week 2 (Aug 23 - 27) – 2D Sketching (Planes, Proper Sketching, Dimensioning, Units, Sketching Tools)
Week 3 (Aug 30- Sep 3) – Sketch Relations (Feature, Plane, Extrusion, Sketch, Boss, Cut, Fillets and Rounds)
Week 4 (Sep 6 -10) – Part Modeling (Extrude Feature, Extrude Cut, Thin Feature, Fillets)
Week 5 (Sep 13-17) - Part Modeling (Edit Feature, Edit Sketch, Measuring, Modifying Dimensions)
Week 6 (Sep 20-24) – Pattern Options (Linear Pattern, Circular Pattern, Mirror Pattern)
Week 7- (Sep 27- Oct 1) – Hole Wizard (Exam 1 Review, Exam #1)
Week 8 (Oct 4-8) – Part Modeling (Revolve Feature, Sweep Feature)
Week 9 (Oct 11-15) - Part Assemblies (Insert Components, Proper Mating, View Mates, Editing Mates, Distance
Mates, Width Mates, Sub Assemblies)
Week 10 (Oct 18-22) – Part Assemblies II
Week 11- (Oct 25-29) - Part Modeling (Sheet Metal, 3D Sketches, Weldments, DXF Files, 3D PDF Files)
Week 12 (Nov 1-5) - Technical Drawings I
Week 13-(Nov 8-12) – Technical Drawings II (Exam 2 Review, Exam #2)
Week 14 (Nov 15-19) – Add-Inns (Animation, Exploded Views, Camworks Intro)
Week 15 - (Nov 22-26) – Thanksgiving Break (No Classes)
Week 16 (Nov 29-Dec 3) – Final Project
Week 17 – (Dec 6-10) EXAM WEEK - Final Exam and Final Project Due Date

Prepared by: Eduardo Gamillo Date: 1/6/11

Course Number and name: ET 120 Computation and Presentation Software

Credits & Contact Hours: 3cr. each week has three lectures of 50 min. each. Total semester contact hours are approximately 37.5.

Instructor's name: Carmen C. Boje

Textbook title, author, and year: Shaffer/Carey/Parsons/Oja//Finnegan
New Perspectives on Microsoft Office 2010, First Course, (ISBN 978-0-538-74653-3) Course Technology, 2011
supplemental materials - Microsoft Office 2010, Internet Explorer, and Windows 7

Specific Course Information:

d. Course Catalog Description - The use of database, spreadsheet, and presentation software in the field of engineering technology. Introduction to Internet resources and construction of homepages.

e. Prerequisite – N/A

f. This course is required for both the ECET and IET degrees

Course Goals & Objectives:

a. The goals for this class are for the student to learn the most important topics of Microsoft Office 2010. No prior computer experience is assumed. First it will be presented an overview of computer concepts, followed by a quick introduction to Windows 7. After the class is comfortable with the basics of computing and operation systems, some e-mail basics and internet browsing skills are briefly covered. Next, students are learning the Microsoft Office 2010 programs, including four sets of tutorials including the basics of Word 2010, Excel 2010, Access 2010, and PowerPoint 2010. They also learn how to integrate these applications, and how to create web pages using each of these applications.

b. **Related ABET Student Outcomes:** The following are the student outcomes that directly relate to Criterion 3.

an appropriate mastery of the knowledge, techniques, skills and modern tools of their disciplines; including:

2) **The use of application software**, the design and use of operating systems, the analysis, design, testing, and documentation of computer programs in support of electronic, instrumentation, communications, control, and/or computer systems. Also ABET 2.b, 2.c, 2.d, 2.f

Course topics and lecture hours devoted to each topic:

TOPICS	**HRS.**
• Essential Computer Concepts	1
• Exploring the Basics of Microsoft Windows 7	1
• Managing Your Files	1
• Browser and E-mail Basics	1
• Getting Started with Microsoft Office 2010	1

- Word 6
- Excel 6
- Access 8
- Power Points 3
- Integration 4
- Creating web pages 3

Laboratory Projects: Each laboratory class is 50 minutes. Laboratory exercises are done in conjunction with the text readings and the lecture materials. The laboratories are designed to learn Office 2010. **Equipment utilized by the students include:** computers with Microsoft Office 2010, Internet Explorer, and Windows 7 installed.

Example of topics for laboratories include:

1. Lab 1: Word Project: Rails to Trails;
2. Lab 2 Excel Project: Displaying your investment portfolio in a chart;
3. Lab 3: Access Project: Your College Record;
4. Lab 4: Integration Project: Grant's Department Store-Year End Summary

Prepared by: Carmen C. Boje **Date: 9/15/10**

Course Number and name: ET 182 Digital Logic

Credits & Contact Hours: 3cr. Each week has two lectures of 75 min. Total semester contact hours are approximately 45 hr.

Instructor's name: Thomas Jenkins

Textbook title, author, and year: *Digital Fundamentals, 10th ed., Floyd*, Prentice Hall, 2009;
References: *TTL Logic Data Book Vol. II*

Specific Course Information:

a) Course Catalog Description - The use of truth tables, Boolean equations, and diagrams to define, simplify, and implement logic-valued functions.

b) Prerequisite – none

c) This course is required for both the ECET, MET, and IET degrees

Course Goals & Objectives:

To provide the student with introductory knowledge and skills relating to basic digital logic and electronic design and applications; to familiarize the electronic and computer engineering technology (ECET) students with a treatment of applied digital systems including small scale integrated devices; and to prepare the ECET students for courses in the next level of analysis and design of digital systems.

Related ABET Objectives and Outcomes: The department of Engineering Technology and Survey Engineering ECET option has an objective of having its graduates possess the following skills and knowledge.

1. An appropriate mastery of the knowledge, techniques, skills and the modern tools of their disciplines including:
    - **Digital circuit analysis and design techniques**, architecture and applications of microcomputer systems, and the building, testing, operation and maintenance of electronic and computer systems.
    - The use **of Boolean mathematics in support of** the analysis, design, and application of electronic systems.
2. An ability to apply current knowledge and adapt to emerging applications of mathematics, science, engineering and technology;

Course topics and lecture hours devoted to each topic:

TOPICS	**HRS.**
• Numeric representations - digital and analog systems	2
• Numbering systems: binary, octal, hex	1
• Converting between number systems	2
• BCD and ASCII codes	2
• Gates (AND, NOR, etc), truth tables, timing diagrams	4
• Alternate logic symbols, IEEE symbols	2
• Boolean and DeMorgans Theorems	2
• SOP equations and simplifications techniques	2

- Karnaugh Map simplification techniques 2
- Circuit diagrams and laboratory topics 2
- Miscellaneous topics 3
- Tests and Quizzes, Review, Problem Solving and Examples 8

Laboratory Projects: There is approximately five laboratory sessions per semester with each laboratory replacing a lecture class of 75 minutes. Laboratory exercises are done in conjunction with the text readings and the lecture materials. The laboratories are designed to apply the theory of the analysis with the application of the circuit. Students must take a problem specification, design a digital circuit, construct the circuit, and verify the design by testing with test and measurement equipment. A *formal* lab write-up is required by each group. **Equipment utilized by the students include (but is not limited to):** Digital Multimeters, Oscilloscopes, logic probes, Cadet designer boards (with built-in switches, LED's, function generators), Function generators and power supplies, Resistors, TTL logic gates and CMOS logic gates in a variety of families.

Example of topics for laboratories might include:

- Design, build, test, and document a digital logic circuit given a Sum-of-Products logic equation or truth table.
- Construct a J-K flip-flop with asynchronous inputs and a PGT clock input using NAND logic. Test the design against the Next-state tables for this device.

Prepared by: Thomas Jenkins **Date: 9/1/10**

Course Number and name: ET 190 Applied Circuits and ET 191 Applied Circuits Laboratory

Credits & Contact Hours: ET 190 is 3cr. Each week has three lectures of 50 min. each. Total semester contact hours are approximately 45 hr.
ET 191 – the accompanying laboratory section is 1cr. (3p) and meets for 2hr and 40 min each week in one lab session per week

Instructor's name: Thomas Jenkins

Textbook title, author, and year: *Principles of Electric Circuits, 9th ed., Floyd*, Prentice Hall, 2009;

Specific Course Information:

d) Course Catalog Description – Application of Ohm's law, Kirchoff's laws, and Thevenin's theorems to the analysis of AC and DC passive circuits. Electronic circuit topics are introduced.

e) Co- or Prerequisite: Math 190 (Co), ET 191 Lab(Co)

f) This course is required for both the ECET and MET degrees. Can be taken as a technical elective or physics substitute for CET and IET degrees

Course Goals & Objectives:
To provide the student with basic knowledge and skills relating to principles of AC/DC circuits.

Related ABET Objectives and Outcomes: The department of Engineering Technology and Survey Engineering ECET option has an objective of having its graduates possess the following skills and knowledge.

3. An appropriate mastery of the knowledge, techniques, skills and the modern tools of their disciplines including:
    - **Digital circuit analysis and design techniques**, architecture and applications of microcomputer systems, and the building, testing, operation and maintenance of electronic and computer systems.
    - The use **of Boolean mathematics in support of** the analysis, design, and application of electronic systems.
4. An ability to apply current knowledge and adapt to emerging applications of mathematics, science, engineering and technology;

Course topics and lecture hours devoted to each topic:

TOPICS	**HRS.**
• Engineering Terminology, methodology, symbology, and notation	3
• Voltage, Current, and Resistance	3
• Series/Parallel Resistive Circuits	3
• Energy and Power	2
• Voltage dividers, current dividers, KVL, KCL	4
• Voltage and current sources	2
• Circuit Theorems, Thevenin's Theorems, Max. Pwr. xfer	5

- Mathematics of matrices and simultaneous equations 3
- Branch, Mesh, Nodal circuit analysis techniques 4
- Capacitors and Inductors in DC and AC 3
- RLC circuit analysis techniques 4
- Transformers 3
- Tests and Quizzes, Review, Problem Solving and Examples 8

Laboratory Projects: There is approximately 14 laboratory sessions per semester. Laboratory exercises are done in conjunction with the text readings and the lecture materials. The laboratories are designed to apply the theory of the analysis with the application of the circuit. Students must take a problem specification, design a digital circuit, construct the circuit, and verify the design by testing with test and measurement equipment. A *formal* lab write-up is required by each group. **Equipment utilized by the students include (but is not limited to):** Digital Multimeters, Oscilloscopes, logic probes, Cadet designer boards (with built-in switches, LED's, function generators), Function generators and power supplies, and various resistors, capacitors, inductors, transformers, wire, et.al.

Example of topics for laboratories might include those topics covered in the ET 190 lecture section

Lab1:
Course Introduction – Safety and Equipment familiarization
Lab procedures and write-up formats
Resistors and the Ohmmeter Measurements
Review the safety lectures via the syllabus links.
Lab 2: Basic Voltage and Current Measurements
Lab 3: Series and Parallel Circuits
Lab 4: Soldering Application Lab
Lab 5: Series/Parallel Circuits
Lab 6: Thevenin's Theorem
Lab 7: Mesh and Node Analysis
Lab 8: Superpostion
Lab 9: The Oscilloscope and AC signals
Lab 10: Capacitors in DC
Lab 11: RC and RL impedances
Lab 12: Frequency Response of an RC, RL, RLC Circuits
Lab 13: Phase Measurement with the Oscilloscope
Lab 14: Transformers

Prepared by: Thomas Jenkins **Date: 9/1/10**

Title and Course Number: ET 210 Computer Aided Design

Credits and Contact Hours: 2 credits Tuesday and Thursday 7:30am-8:45am

Instructor: *Wesley Eaton, Office Room 238 ECIII, 575-646-3350, Hours: Tuesday, Thursday 8:45-10:45 or by appointment*

Textbook: Engineering Design and Graphics with SolidWorks 2010 by James D. Bethune

Prerequisite: ET 110

Course Description: ET 210 is a required course for the Mechanical ET option. Students will learn how to properly create complex parts and assemblies using advanced modeling techniques in the SolidWorks solid modeling software. They will learn how to put these parts and assemblies into production drawings using proper Geometric Dimensioning and Tolerancing (GD&T) standards. In addition, the students will gain some background into available add-in software packages available for SolidWorks. The add-in modules that will be used are COSMOSworks for Finite Element Analysis (FEA), COSMOS Motion for dynamic system analysis, COSMOS FloWorks for Fluid Analysis, PDMworks for Product Data Management (PDM), Tool box parts, Design tables with multiple configurations, Hole Series and Hole Wizard and CAMworks for Computer Aided Manufacturing (CAM).

Course Objectives:

- Knowledge of properly operating a CAD system in the most efficient manner
- Ability to generate and easily update Part models
- Ability to create complex assembly models
- Ability to create usable production drawings from 3-D CAD models
- Understanding of Geometric Dimensioning and Tolerancing
- Knowledge of available add-in software compatible with SolidWorks (FEA, CAM, PDM)
- Ability to work in a group and operate effectively on a team
- Ability to use creative and technical thinking skills in design

Grading	Exams	30%
	Homework	30%
	Class Project	25%
	Attendance	15%

Semester Grading will be based on: 90%-A, 89%-80%-B, 79%-70%-C, 69%-60%-D, below 59%-F.

Attendance Policy- Attendance is mandatory for class- **Students who miss more than three classes will be dropped from course prior to withdrawal date or will not pass course after this date.**

ET 210 Course Schedule - Spring 2011

Week 1 (Jan 13) – CAD Refresher

Week 2 (Jan 18 - 20) – Using PDMworks Product Data Management system

Week 3 (Jan 25-27) – Advanced Part Modeling (Proper Sketching, Custom Properties, Material Properties, Dimensioning, Hole Wizard, Hole Series, Mass Properties, Lofts, Sweeps, Revolves, other model features, Configurations using Design Tables, Sheet Metal, Equations, Weldments and Custom Settings)

Week 4 (Feb 1-3) – Advanced Assembly Modeling (Proper Mating, Assembly Configurations, Advanced mates, Difficult Part Mates)

Week 5 (Feb 8-10) - **Course Test #1 -- Thursday, February 10th**

Week 6 (Feb 15-17) – Advanced Assembly Modeling II (Top-down Assembly Modeling)

Week 7- (Feb 22-24) - Advanced Assembly Modeling III (Assembly Modeling, Drive Trains, Complex Assemblies)

Week 8 (Mar 1-3) – SolidWorks Add-Ins and Tool Boxes (Animator/Photoworks/3D scan)

Week 9 (Mar 8-10) (**Mar 8- Last day to drop with a W) -** Advanced Drawings (BOMs, Weldment Cut lists, Getting the right information out)

Week 10 (Mar 15-17) – **Course Test #2 -- Thursday March 17th**

Week 11- (Mar 22-24) -SPRING BREAK – No Class

Week 12 (Mar 29-31) - Geometric Dimensioning and Tolerancing and Drawings

Week 13-(Apr 5-7) – Class CAD Project

Week 14 (Apr 12-14) – Class CAD Project

Week 15 - (Apr 19-21) – CAMworks, Class CAD Project

Week 16 (Apr 26-28) –COSMOS Motion, COSMOSworks and COSMOS Flow Works, PCB Import, Exporting files, Class CAD Project

EXAM WEEK - **Course Test #3** -- Tuesday May 3, 8:00 Am – 10:00 Am

Prepared by: Wesley Eaton 12/15/10

Course Number and name: ET 217 Manufacturing Processes

Course Instructor: Anthony Hyde, EC3-Rm 284, 575 646 5029, Off Hrs-MWF 9:30-11:30 ahyde@nmsu.edu

Course Description- Course will provide a technical overview of the many different types of manufacturing processes commonly found in industry with a focus on casting, machining and forming processes and how they relate to everyday products people use. Course will also provide students with a global, historical, and regional perspective on manufacturing. Course is accompanied by a "hands-on" laboratory.

Prerequisite: Sophomore standing – including math 190

Required Textbook- "***Processes of Manufacturing***"- T. R. Wright Goodheart-Wilcox. Industrial Press Inc., 1st Edition, (copyright 2004)

Outcomes of Instruction

- Understanding of historical, global and regional manufacturing issues.
- Expose students to how and why things are made the way they are.
- Technical knowledge of casting, machining and forming process.
- General knowledge of Conditioning, Assembling and Finishing Process.
- Working knowledge industrial materials.
- Ability to determine cost effective methods of producing goods.
- Gain "hands-on" experience in a manufacturing and shop environment

Abet Outcomes addressed in this course

1. develop an ability to identify, analyze and solve technical problems,
2. develop an ability to apply creativity in the design of systems, components or processes appropriate to program objectives,
3. develop an ability to gain a respect for diversity and a knowledge of contemporary professional, societal and global issues, and
4. develop a commitment to quality, timeliness and continuous improvement

Grading –Course will be based on a 1000 pts total.

8 Homework Assignments (25 pts each) ----------250
Note-Home will not be accepted unless it is typed.
8 Quizzes- 25 pts each ---------- 250
Some class Quizzes and some blackboard quizzes..
3 TESTS- 100 pts each----------300
Comprehensive Final Exam (Thursday 5/5 10:30-12:30) ------150
Attendance----------50
Attendance will be checked periodically in class.
Total 1000 pts

Course Number and Name: ET 217L Manufacturing Processes Laboratory

Credits & Contact Hours: ET 217 Lab, 1 cr., one weekly laboratory session of 2.5 hours. Total semester contact hours are approximately 35.

Instructor's name: Charles Park

Textbook title: ET 217L Laboratory Manual,
author, and year: Park, C., 2011.

Supplemental materials: Laboratory project kit: calipers, misc. tools, safety glasses, and materials and components to build model race car.

Machinery's Handbook, Oberg, E, et al., Industrial Press, 2008.

Specific Course Information:

Course Catalog Description – Laboratory to accompany ET 217.
Prerequisite – ET 217 (if not taken concurrently with ET 217).
Corequisite – ET 217.
Augmenting – This is a required course in the MET curriculum.

Course Goals and Objectives:

Students acquire practical understanding of common manufacturing processes and become familiar with the application of mathematics in manufacturing, to include calculations related to bolt-hole circles, feed rates, and spindle speeds. Also, students gain knowledge of national standards and their application in accordance with the Machinery's Handbook. Moreover, students gain practical insights into the basics of geometric dimensioning and tolerancing and design for manufacturability.

Related ABET Outcomes:

The following are the MET (9x) and ABET student outcomes that directly relate to Criterion 3. An ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline; to include:
(9c) Basic knowledge of manufacturing processes, engineering materials and their selection, measuring tools, machine tools, quality systems and processes, process improvement methods, economic principles, cost analysis techniques, and project management, relevant to mechanical technology areas. Also ABET 3.a, 3.b, and 3.c.

Course topics and lab session hours devoted to each topic:

Topics	**Lab Hours**
• Introduction: laboratory overview, relevance, and significance	1
• Safety and its importance in contemporary manufacturing operations	4
• Use of technical standards and handbooks in manufacturing practice	2
• Practical applications of mathematics in basic manufacturing processes	4
• Good practice in design for manufacturability	2
• Important aspects of design practice	2
• Basics of geometric dimensioning and tolerancing in practice	4
• Common manufacturing processes and their practical implementation	4
• Good practice and techniques in the operation of modern manufacturing equipment	4
• The significance of quality assurance and its implementation in practice	2
• The practical aspects of inspection and inspection tools in manufacturing	2
• The significance of good workmanship in manufacturing operations	2
• Fundamentals of parts assembly	2

Prepared by: Charles Park Date: 05/27/11

Course Number and name: ET 240 Applied Statics

Credits and Contact Hours: 3 cr. 46 contact hours -- lecture

Instructor's name: Ruinian Jiang

Textbook: Bedford, A. and Fowler, W., 2007, Engineering Mechanics: Statics, 5th Ed., Prentice Hall, Upper Saddle River, NJ. ISBN: 0136129153

Specific Course Information:
Course Description: Fundamental principles and their application in the analysis of forces acting on rigid bodies at rest. The use of vectors, equilibrium conditions and equations, concentrated and distributed force systems, free body diagrams, the methods of joints and sections, the centroid, moments of area and inertia, and shear and moment diagrams as prerequisites to the analysis and design of static structures. Important aspects of surface friction and virtual work.

Prerequisites: Math 190 (180) and 121 (185) and Physics 211, Co-requisite: Math 235 (236)

Course Goals/ Objectives:

- to introduce the physical concepts and basic principles of applied statics
- to acquaint students with problem solving methods in applied statics
- to provide students with practice in applying fundamental, systematic approaches to solving applied statics problems.

Contribution of Course to Meeting the Professional Component:

With respect to the Program Outcomes for graduates of the Engineering Technology Department, this course contributes directly to mastery of the knowledge, techniques, skills, and modern tools of the disciplines for students in the mechanical and civil options. The course provides students with practice in developing the ability to apply current knowledge and adapt to emerging applications of mathematics, science, engineering, and technology. It also helps them not only develop the ability to identify, analyze, and solve technical problems, but also adopt a commitment to quality, timeliness, and continuous improvement.

Week	Topics	Chapters
1	Introduction: course overview, fundamental concepts	1
2	Vector definitions and operations, cartesian components, vector products	2
3	Types of forces, free body diagrams, 2-D and 3-D force systems	3

4	Systems of forces and moments, equivalent systems, Review	4
5	Exam I, Rigid body equilibrium: equations	1-4
6	Rigid body equilibrium: equations, support reactions, static indeterminancy	5
7	Analysis of trusses: methods of joints and sections; frames, and machines	6
8	Centroids of areas and centers of mass, Review	7
9	Exam II, Moments of area and mass moments of inertia, parallel axis theorems	5-7, 8
10	Moments of area and mass moments of inertia, parallel axis theorems	8
11	Frictional forces on wedges, threads, bearings, belts, and ropes, Internal loads	9
12	Review, Exam III, Axial force, shear force, and bending moment; shear and moment diagrams	8-9
13	Axial force, shear force, and bending moment; shear and moment diagrams, Distributed loads	10
14	Distributed loads, pressure, center of pressure, and hydrostatic loads, Review	10
15	Thanksgiving Holiday ☺	
16	Review and cover necessary topics	1-10
18	**Final Exam (8:00 – 10:00 am)**	

Prepared by Ruinian Jiang, December 2010

Course Number and Name: ET 241, Applied Dynamics

Credits & Contact Hours

Credits	Lectures	Lab	Semester Contact Hours
3.0	(3) 50 min lectures per week	None	45

Instructors Name: Manuel Gomez

Textbook title, *Engineering Mechanics Dynamics*, 12th edition
author and year: Hibbeler, R.C., 2010

Specific Course Information:

a. **Course Catalog Description** - Applied kinematic and kinetic planar analysis of particles and rigid bodies, including use of kinematic equations, Newton's Second Law, the work energy method, and the Impulse Momentum Method.
b. **Prerequisites:** ET 240 (Statics) and Math 235 (Calculus I).
c. This course is required for ME-ET and CE-ET degrees

Course Goals & Objectives:
Students will gain an understanding of the methods used for solving dynamics (both kinematic and kinetic) problems for particles and rigid bodies. This includes the use of the kinematic equations, equations of motion derived from Newton's Second Law, the Work-Energy method, and Impulse Momentum method.

Related ABET Objectives & Outcomes: An ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline, to include the following:

Student Outcomes of Instruction from MET (x.)	Student Outcomes/ Criteria 3
(1.) **Algebra, trigonometry**, Boolean mathematics**, calculus**, statistics and probability, **fundamental principles and concepts of science and engineering technology, good practice in problem solving,** and **methods of standard practice in the analysis** and applied design of **mechanical systems** as applied to kinematics and kinetics problems for both, particle and rigid body analysis.	3.a, 3.b, 3.f

Course Topics	Class Hours
Course Introduction	1
Kinematics of a Particle	
Rectilinear Motion	1
Motion of a Projectile	2
Normal Tangential Components	1
Cylindrical Components	1
Dependent Motion	1
Relative Motion	1
Kinetics of a Particle – Newton's Second Law	
Equations of Motion – Rectangular Components	2
Equations of Motion – Normal and Tangential Components	2
Equations of Motion – Cylindrical Components	2
Kinetics of a Particle – Work and Energy	
Principle of Work and Energy	2
Power and Efficiency	1
Conservation of Energy	1
Kinetics of a Particle – Impulse and Momentum	
Principle of Linear Input and Momentum	2
Impact	2
Angular Momentum	1
Planar Kinematics of a Rigid Body	
Planar Rigid Body Motion - Translation	1
Planar Rigid Body Motion - Rotation	1
Relative Motion: Velocity	1
Instantaneous Center of Zero Velocity	1
Relative Motion: Acceleration	1
Planar Kinetics of a Rigid Body: Force and Acceleration	
Equations of Motion: Translation	1
Equations of Motion: Rotation about a Fixed Axis	1
Equations of Motion: General Plane Motion	1
Planar Kinetics of a Rigid Body: Work and Energy	
Principle of Work and Energy	2
Conservation of Energy	1
Planar Kinetics of a Rigid Body: Impulse and Momentum	1
Principle of Impulse and Momentum	1
Conservation of Momentum	1
Vibrations	
Undamped Free Vibration	2
3 regular class exams and 1 final comp exam	6

Prepared by Manuel Gomez, 01/11/2011

Course Number and name: ET 262 Software Technology I

Credits & Contact Hours: 3cr. each week has three lectures of 50 min. each. Total semester contact hours are approximately 37.5.

Instructor's name: Carmen C. Boje

Textbook title, author, and year: Richard A. Johnson, An Introduction to Java Programming and Object-Oriented Application Development. Thomson Course Technology, 2007, ISBN 0-619-21746-4.

supplemental materials – JAVA, Notepad, VI, DOS, Internet Explorer, Windows 7.

Specific Course Information:

g. Course Catalog Description - An introduction to computer programming concepts as applied to engineering technology. Includes basic logic design, algorithm development, debugging and documentation. History and use of computers and their impact on society. Satisfies general education computer science requirement.

h. Prerequisite – ET 120, Math 121 G

i. This course is required for both the ECET and IET degrees

Course Goals & Objectives:

c. This course provides an introduction to Java programming and object-oriented application development. It is intended for beginning programming students in computer science or computer information systems. All fundamental programming concepts including control structures, VI and DOS prompt are covered.

d. **Related ABET Student Outcomes:** The following are the student outcomes that directly relate to Criterion 3.

an appropriate mastery of the knowledge, techniques, skills and modern tools of their disciplines; including:

3) **The use of application software**, the design and use of operating systems, the analysis, design, testing, and documentation of computer programs in support of electronic, instrumentation, communications, control, and/or computer systems. Also ABET 2.b, 2.c, 2.d, 2.f

Course topics and lecture hours devoted to each topic:

TOPICS	**HRS.**
• Computers, Programming, and Application Development	6
• Fundamentals of Java Programming	7
• Making Decisions with Java	7
• Repeating Program Statements	8
• Methods and Classes	7

Laboratory Projects: Each laboratory class is 50 minutes. Laboratory exercises are done in conjunction with the text readings and the lecture materials. The laboratories are designed to

learn to program and debug JAVA programs. **Equipment utilized by the students include:** computers with JAVA, Notepad, VI and DOS editor, Internet Explorer, Windows 7 installed.

Example of topics for laboratories include:

5. Assignment 1: Hello World using scanner class, directory creation and navigation tree
6. Assignment 2: Hello world using GUI class
7. Assignment 3: Average
8. Assignment 4: Area
9. Assignment 5: Volume
10. Assignment 6: Temperature conversion
11. Assignment 7: Marathon
12. Assignment 8: Gratuity
13. Assignment 9: Greater Than
14. Assignment 10: Activity
15. Assignment 11: Min Max Average
16. Assignment 12: Checking a number
17. Assignment 13: Raise to a Power
18. Assignment 14: Triangle Perimeter
19. Assignment 15: Sum of Integers using the While loop
20. Assignment 16: Sum of Integers using the For loop
21. Assignment 17: Sum of Integers using the Do While loop
22. Assignment 18: Integer Math
23. Assignment 19: Miles to kilometers conversion
24. Assignment 20: Student GPA
25. Assignment 21: Upper to Lower case conversion
26. Assignment 22: Calculate GPA using classes
27. Assignment 23: Calculator using classes
28. Assignment 24: Carbon - 14

Prepared by: Carmen C. Boje **Date: 1/10/11**

Course Number and Name: ET 302, Manufacturing Data Analysis

Credits & Contact Hours

Credits	Lectures	Lab	Semester Contact Hours
3.0	(3) 50 min lectures per week	None	45

Instructors Name: Manuel Gomez

Textbook title, *Statistical Methods for Engineers, 3rd edition*
author and year*:* by Geoffrey Vining & Scott M. Kowalski, 2011

Specific Course Information:

d. Course Catalog Description – Methods for analyzing data collected during manufacturing processes. Emphasis placed on production control utilizing results of statistical methods and design of experiments.

e. Prerequisites: Math 235 (Calculus I).

f. This course is required for MET, CET, ECET, IET degrees

Course Goals & Objectives: Students will gain an appropriate mastery of the knowledge, techniques, skills and modern tools of their disciplines; including:

- methods for data collection and analysis for manufacturing processes
- graphical analysis for manufacturing data
- probabilistic modeling and descriptive statistics
- variability and distribution for the data
- methods used for formal estimation
- basic statistical concepts for manufacturing process monitoring using control charts
- basic statistical concepts for analyzing formal experiments (Design of Experiments)
- applied Six Sigma as used in Industry
- Minitab statistical software and Mathcad analysis software

Related ABET Objectives & Outcomes: An ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline, to include the following:

Student Outcomes of Instruction from MET (x.)	Student Outcomes/ Criteria 3
(1.) **Algebra**, trigonometry, Boolean mathematics, calculus, **statistics and probability**, fundamental principles and concepts of science and engineering technology**, good practice in problem solving**, and methods of standard practice in the analysis and applied design of mechanical systems	3.a, 3.b, 3.c, 3.f, 3.k
(4**.) Current software corresponding to good practice in the application of mechanical engineering technologies**. Software application functions to include: word processing, spreadsheet calculations, **graphing, presentation media**, computer assisted drafting and manufacturing**,** manufacturing processes, **statistics**, data acquisition, **project management**, and the analysis and applied design of systems involving mechanisms, machines, or fluid thermal processes.	3.a, 3.b, 3.c

Week of	Chapter Topic	Contact Hours
Jan 10	Course Introduction & overview	1
17	Mathcad, Minitab overview	3
24	Statistics in Industry, What is Six Sigma?	3
31	Engineering Method and Data Collection	3
Feb 07	Data Displays: stem and leaf, boxplots, histogram, time plots	3
14	Review, [***Exam I***]	3
21	Modeling Random Behavior: Probability, Random Variables	3
28	Modeling Random Behavior: Discrete & Continuous	3
March 07	Estimation and Testing	3
14	Control Charts and Statistical Process Control (SPC)	3
21	***Spring Break March 21-25***	0
28	Linear Regression, Review, [***Exam II***]	3
April 04	Linear Regression	3
11	Full factorial and 2^k Factorial Experiments	3
18	Introduction to Response Surface Methodology	3
25	Review***, [Exam III***]	3
May2	*Final Exam* (optional make-up)	2

Prepared by Manuel Gomez, 01/21/2011

Course Number and Name: ET 306, Fundamental and Applied Thermodynamics

Credits & Contact Hours: 3cr., three lectures weekly of 50 min. each.
Total semester contact hours are approximately 40.

Instructor's name: Craig Ricketts
Textbook *title*, author, and year: *Thermodynamics - An Engineering Approach*, Çengel, Y. A. and Boles, M. A., 2008.
Supplemental materials: *CyclePad*, a shareware application for cycle analysis.
Specific Course Information:

j. Course Catalog Description - First and second laws, properties of substances, thermodynamic cycles including power generation and refrigeration.

k. Prerequisites – Chem 110G Basic Chemistry, ET 240 Statics, and Math 235 Calculus I.

l. Laboratory – See relevant documentation for separate laboratory course.

m. Augmenting – This is a required course in the CET and MET curricula.

Course Goals and Objectives:

Student acquires an understanding of the physical concepts and basic principles of fundamental and applied thermodynamics. Also, student becomes acquainted with relevant problem solving methods and tools of good practice. Through repeated application of focused and systematic approaches to problem solving, student gains pertinent experience in the analysis of important contemporary thermodynamic processes.

Related ABET Outcomes:

The **following** are the MET (x.) and ABET student outcomes that directly relate to Criterion 3. *An ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline;* to include:

(1.) **Application of** algebra, trigonometry, Boolean mathematics, calculus, statistics and probability, **fundamental principles and concepts of science and engineering technology**, **good practice in problem solving**, and **methods of standard practice in the analysis** and applied design **of mechanical systems**.
Also ABET 3.a., 3.b., 3.e., 3.f., and 3.k.

(4.) **The use of current software corresponding to good practice in the application of mechanical engineering technologies. Software application functions to include:** word processing, **spreadsheet calculations**, **graphing**, presentation media, computer assisted drafting and manufacturing, manufacturing processes, statistics, data acquisition, project management, and **the analysis** and applied design **of systems involving** mechanisms, machines, or **fluid and thermal processes**.
Also ABET 3.a., 3.b., 3.f., and 3.k.

Course topics and class hours devoted to each topic:

Topics	Class Hours
· Introduction: field overview and significance, historical perspectives	1
· Units and basic definitions, pressure, temperature, and 0^{th} law	1
· Properties of pure substances	1
· Property diagrams and tables, equations of state, and compressibility factor	3
· Specific heats: for ideal gases and for solids and liquids	1
· The first law and closed systems: rigid tanks, piston/cylinder devices	3
· The first law and open systems: turbines, compressors, nozzles, diffusers, mixing chambers, heat exchangers	4
· The second law and its applications	3
· Entropy and applications	3
· Exergy and applications of second law analysis	1
· Gas power cycles: Otto, Diesel, and Brayton	3
· Vapor and combined power cycles: Rankine, Brayton/Rankine	4
· Cogeneration	1
· Refrigeration cycle for refrigerators, air conditioners, and heat pumps	3
· Software application for thermodynamic cycle analysis	1
· Fundamentals and applications of psychrometrics: chart, cooling towers	2
· Examinations	4
· Topic Reviews	4

Laboratory Projects: See relevant documentation for separate laboratory course.

Examples of lab topics: See relevant documentation for separate laboratory course.

Prepared by: Craig Ricketts **Date**: 12/18/10

Course Number and Name: ET 306L, Thermodynamics Laboratory

Credits & Contact Hours: 1cr., one weekly laboratory session of 2.5 hours. Total semester contact hours are approximately 40.

Instructor's name: Craig Ricketts

Textbook *title*, author, and year: *Thermodynamics - An Engineering Approach*, Çengel, Y. A. and Boles, M. A., 2008.

Supplemental materials: *Virtual Experiments in Food Processing*, Singh, R. P. and Erdogdu, 2009; *CyclePad*, a shareware application for cycle analysis; and *Engineering Equation Solver, (EES)* of F-Chart Software.

Specific Course Information:

n. Course Catalog Description – Applications of thermodynamic theory to lab devices. Practice in testing, data collection, and instrumentation.

o. Corequisite – ET 306 Fundamental and Applied Thermodynamics.

p. Augmenting – This is a required course in the MET curriculum.

Course Goals and Objectives:

Student acquires practical exposure to the fundamental concepts, experimental methods, and instrumentation encountered in applied thermodynamic processes. Also, student becomes familiar with the development and application of procedures for laboratory work and for the acquisition, processing, evaluation, and presentation of experimental data. Additionally, student gains experience in the preparation of well-organized technical reports and oral presentations that are accurate, comprehensive, and concise.

Related ABET Outcomes:

The **following** are the MET (x.) and ABET student outcomes that directly relate to Criterion 3. *An ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline;* to include:

(2.) **Application of** algebra, trigonometry, Boolean mathematics, calculus, statistics and probability, **fundamental principles and concepts of science and engineering technology**, **good practice in problem solving**, and **methods of standard practice in the analysis** and applied design **of mechanical systems**.
Also ABET 3.a., 3b, 3.c., 3.e, 3.g., and 3.k.

(3.) **Implementation of** the fundamental aspects of AC and **DC circuits**, **electrical components**, computer programming logic, instrumentation principles, **experimental techniques**, and **methods of standard practice**, **safety consciousness**, and **codes and standards** in the **testing** and **evaluation** of **mechanical systems**.
Also ABET 3.a., 3b, 3.c., 3.e, 3.g., and 3.k.

(4.) **The use of current software corresponding to good practice in the application of mechanical engineering technologies. Software application functions to include: word processing**, **spreadsheet calculations**, **graphing**, **presentation media**, computer assisted drafting and manufacturing, manufacturing processes, **statistics**, **data acquisition**, project management, and the **analysis** and applied design **of systems involving** mechanisms, machines, or **fluid and thermal processes**.
Also ABET 3.a., 3b, 3.c., 3.g., and 3.k.

Course topics and lab session hours devoted to each topic:

Topics	**Lab Hours**
· Introduction: laboratory overview, relevance, and significance	1
· Safety in laboratory practice	3
· Professional ethics: a case study in how to proceed as a whistleblower in reporting of ethical lapses in industrial practice	2
· Use of codes and standards in practice	1
· Good practice guidelines for an employment search	1
· Good practice in the graphing of experimental data for technical reports	1
· Application of sample statistics in the evaluation of experimental data	1
· Application of error analysis in the planning of an experiment	1
· Thermodynamic properties, units and basic definitions; review of in practice	2
· Data acquisition techniques using TI graphing calculators	2
· Sensors types for temperature measurements	2
· Fundamental principles of temperature measurement	2
· Temperature sensor calibration in practice	2
· Use of fixed thermodynamic states in the calibration of temperature sensors	2
· Concept of simple-substance specific heat and practical applications	2
· Application of an IC-engine dynamometer in practice	2
· Concepts of torque, power, efficiency, and specific fuel economy as IC-engine performance characteristics	2
· Spreadsheet-based calculation of IC-engine performance characteristics	2
· Concept and application of the time constant in temperature measurement	3
· Concept of the latent heat of fusion and related application of the *T-h* diagram	3
· Use of an Hg barometer and corrections to readings of atmospheric pressure	1
· Application of software in cycle analysis	3
· Exposure to industrial-scale components such as pumps, heat exchangers, absorption refrigeration components, thermal energy storage pool, pipe and pipe fittings, gas turbine, vapor compression refrigeration system, measurement and control equipment, and utility tunnels; via a field trip to an on-campus co-generation plant.	2

Prepared by: Craig Ricketts **Date**: 12/20/10

Course Number and Name: ET 308, Fluid Technology

Credits & Contact Hours: 3cr., two weekly lectures of 75 min. each.
Total semester contact hours are approximately 40.

Instructor's name: Craig Ricketts
Textbook *title*, author, and year: *Applied Fluid Mechanics*, Mott, R. L., 2006.
Supplemental materials: *Spreadsheet tools* provided by author on CD that accompanies textbook, for calculation of friction losses in series and parallel flow pipe systems and for pump selection.

Specific Course Information:

q. Course Catalog Description – Application of basic principles of fluid mechanics to practical applied problems.
r. Prerequisites – ET 240 and Math 235.
s. Laboratory – See relevant documentation for separate laboratory course.
t. Augmenting – This is a required course in the CET and MET curricula.

Course Goals and Objectives:

Student acquires an understanding of the physical concepts and basic principles of applied fluid mechanics. Also, student becomes acquainted with relevant problem solving methods and tools of good practice. Through repeated application of systematic approaches to problem solving, student gains pertinent experience in the analysis of fluid technology systems of contemporary practice, as well as insights into their design.

Related ABET Outcomes:

The **following** are the MET (x.) and ABET student outcomes that directly relate to Criterion 3. *An ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline;* to include:

(5.) **Application of** algebra, trigonometry, Boolean mathematics, calculus, statistics and probability, **fundamental principles and concepts of science and engineering technology**, **good practice in problem solving**, and **methods of standard practice in the analysis** and applied design **of mechanical systems**.
Also ABET 3.a., 3.b., 3.f., and 3.k.

(4.) **The use of current software corresponding to good practice in the application of mechanical engineering technologies. Software application functions to include:** word processing, **spreadsheet calculations**, graphing, presentation media, computer assisted drafting and manufacturing, manufacturing processes, statistics, data acquisition, project management, and **the analysis** and **applied design of systems involving** mechanisms, machines, or **fluid and thermal processes**.
Also ABET 3.a., 3.b., 3.f., and 3.k.

Course topics and class hours devoted to each topic:

Topics	**Class Hours**
· Introduction: field overview and significance, historical perspectives	1
· Fluid properties, units and basic definitions	1
· Viscosity and *Newtonian* and non-*Newtonian* fluids	1
· Pressure-height relation and forces of static fluids on submerged surfaces	3
· Buoyancy and stability	3
· Continuity equation and *Bernoulli* equation	3
· *Torricelli*'s theorem and flows with falling heads	1
· General energy equation	1
· *Reynold*s No., laminar and turbulent flow regimes, and friction losses in viscous flow	2
· Velocity profiles for circular cross-sections, flow in non-circular sections	1
· Minor friction losses in viscous flow	3
· Series and parallel pipeline systems	3
· Pump applications and selection	3
· Application of spreadsheets to friction-loss calculations and pump selection	1
· Flow of liquids in open channels	3
· Flow measurement and forces of moving fluids on solid bodies	3
· Aerodynamic drag and lift	3
· Examinations	3
· Topic Reviews	3

Laboratory Projects: See relevant documentation for separate laboratory course.

Examples of lab topics: See relevant documentation for separate laboratory course.

Prepared by: Craig Ricketts **Date**: 12/19/10

Course Number and Name: ET 308L, Fluid Technology Laboratory

Credits & Contact Hours: 1cr., one weekly laboratory session of 2.5 hours.
Total semester contact hours are approximately 40.

Instructor's name: Craig Ricketts
Textbook *title*, author, and year: *Applied Fluid Mechanics*, Mott, R. L., 2006.
Supplemental materials: *Spreadsheet tools* provided by author on CD that accompanies textbook, for calculation of friction losses in series and parallel flow pipe systems and for pump selection. *Software application, Flowmaster of Bentley's Haestad Methods*, for open channel flow analysis and design.

Specific Course Information:

u. Course Catalog Description – Measurements in fluid statics, dynamics, and hydraulic systems.

v. Corequisite – ET 308 Fluid Technology

w. Augmenting – This is a required course in the CET and MET curricula.

Course Goals and Objectives:

Student acquires practical exposure to some of the fundamental concepts, experimental methods, and instrumentation encountered in the field of fluid technology. Also, student becomes familiar with the development and application of procedures for laboratory work and for the acquisition, processing, evaluation, and presentation of experimental data. Additionally, student gains experience in the preparation of well-organized technical reports that are accurate, comprehensive, and concise.

Related ABET Outcomes:

The **following** are the **MET** (x.) and ABET student outcomes that directly relate to Criterion 3. *An ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline;* to include:

(6.) **Application of** algebra, trigonometry, Boolean mathematics, calculus, statistics and probability, **fundamental principles and concepts of science and engineering technology**, **good practice in problem solving**, and **methods of standard practice in the analysis** and applied design **of mechanical systems**.
Also ABET 3.a., 3b, 3.c., 3.e, 3.g., and 3.k.

(7.) **Implementation of** the fundamental aspects of AC and DC circuits, electrical components, computer programming logic, instrumentation principles, **experimental techniques**, and **methods of standard practice** in the **testing** and **evaluation** of **mechanical systems**, **safety consciousness**, and **codes and standards**.
Also ABET 3.a., 3b, 3.c., 3.e, 3.g., and 3.k.

(8.) **The use of current software corresponding to good practice in the application of mechanical engineering technologies. Software application functions to include: word processing**, **spreadsheet calculations**, **graphing**, presentation media, computer

assisted drafting and manufacturing, manufacturing processes, **statistics**, **data acquisition**, project management, and the **analysis** and applied design **of systems involving** mechanisms, machines, or **fluid and thermal processes**.
Also ABET 3.a., 3b, 3.c., 3.e, 3.g., and 3.k.

Course topics and lab session hours devoted to each topic:

Topics	**Lab Hours**
· Introduction: laboratory overview, relevance, and significance	1
· Safety in laboratory practice	2
· Academic ethics: a case study in plagiarism of intellectual property in an academic laboratory setting	1
· Professional ethics: a case study in how to seek relevant counsel toward making the best decision to address ethical dilemmas in industrial practice	1
· Good practice in the graphing of experimental data for technical reports	1
· Use of codes and standards in practice	1
· Good practice guidelines for an employment search	1
· Application of sample statistics in the evaluation of experimental data	1
· Application of uncertainty analysis in the evaluation of experimental data	1
· Fluid properties, units and basic definitions; review of in practice	2
· Application of free body diagrams and equations of equilibrium in fluid systems under static equilibrium; review of in practice	3
· Viscosity measurement techniques for *Newtonian* fluids; review of in practice	2
· Pressure-height relation and forces of static fluids on submerged surfaces; review of in practice	3
· Application of buoyancy principles in fluid systems under static equilibrium	2
· Application of an inclined reservoir manometer in practice	1
· Pressure sensor calibration in practice	2
· Dimensionless No.'s in static fluid systems involving surface tension, gravity, buoyancy, and temperature, as an example	2
· Spreadsheet-based calculation of pipe and minor friction losses in viscous flow	3
· Friction loss in series flow piping systems, spreadsheet-based calculation of	3
· Friction loss in parallel flow piping systems, spreadsheet-based calculation of	3
· Generation of system resistance curve and pump selection using spreadsheets	3
· Application of software in open channel flow analysis and design	3
· Exposure to lab- and industrial-scale components such as a pump, a variable frequency drive, a diffuser, pipe and pipe fittings, flow conditioning hardware, a test section, and flow measurement and visualization techniques; via a field trip to an on-campus water channel test facility.	2

Prepared by: Craig Ricketts **Date**: 12/19/10

Title and Course Number: ET 310 and ET 310 Laboratory, Strength of Materials

Credits and Contact Hours: 4 cr. 42 contact hours -- lecture
40 contact hours – laboratory

Course Description: Application of the principles of strength of materials to practical design and analysis problems.

Prerequisites: ET 240 and Math 235

Textbook: Applied Strength of Materials, 4th or 5th Ed., by Robert L. Mott

Instructor: Kenny Stevens, P.E., ECIII Rm 383 and/or 183, 646-2491, Office hours: 3:00 - 4:30 M-T-W-Th.

Desired Outcomes	**Assessment Tool**
To conduct appropriate experiments in the laboratory as they apply to strength of materials and be able to interpret the results (ABET 9c).	Formal lab reports
To obtain a knowledge of appropriate engineering materials and their use in civil and mechanical construction (ABET 9e).	ASTM Standards presentation
To apply basic technical concepts to the solution of civil problems involving structures and material behavior (ABET 9f)	Class Homework
To perform standard analysis and design in the area of structures and machine elements (ABET 9g)	Design- based final exam
To promote awareness that material analyses are often keys in keeping projects on schedule and as such, reporting results in a timely manner is of the utmost importance (ABET 3k).	Timeliness of homework

Computer Usage: Excel, SolidWorks, MDSolids

Laboratory: Materials such as steel, aluminum, wood, plastics and composites are tested for their engineering properties. Topics include:

Report Writing
Stress-Strain Relationships (Data)
Static Tensile Test of Metals
Static Tensile Test of Plastics
Torsion Test of Cylindrical Rods
ASTM Standards
Direct Shear Test
Composite versus Traditional Materials
Hardness and Impact Tests
Small Clear Timber Tests
Stress in a Cantilever Beam (Strain Gages)
Observing Stress Concentrations
Finite Element Modelling

Oral and Written Communication Requirements: Periodic laboratory reports on material properties. These take the form of memoranda, business letters and formal reports.

Calculus Usage: Used in the development of shear, moment, slope & deflection equations.

Library Usage: The principal reference used in the class and laboratory is the ASTM Standards. Students must make use of these of these standards several times throughout the semester. These standards are available at the Zuhl Library.

Prepared By: Kenny Stevens 08/2010

Course Number and Name: ET 328, Kinematics of Machines
Credits & Contact Hours

Credits	Lectures	Lab	Contact Hours
3.0	(2) 50 min lectures/ week	(1) 2.5 hour /week	50

Instructor Name: Manuel Gomez

Textbook title, *Design of Machinery (4th Ed*)
author and year: Norton, Robert L., 2008

Specific Course Description:

a. **Course Catalog Description** – Kinematic analysis of machine elements with topics of linkages, cams, and gears. Graphical and analytical solutions using computer techniques.
b. **Prerequisites:** ET 241 (Dynamics)
c. This course is required for MET degrees.

Course Goals & Objectives: To familiarize students with the kinematic synthesis and analysis techniques for linkages, cams and gears.

Related ABET Objectives & Course Outcomes: An ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline, to include the following:

Student Outcomes of Instruction from MET (x.)	Student Outcomes /Criteria 3
(1.) **Algebra, trigonometry**, Boolean mathematics**, calculus**, statistics and probability, **fundamental principles and concepts of science and engineering technology, good practice in problem solving,** and **methods of standard practice in the analysis and applied design** of **mechanical systems** as applied to analysis and design of machine elements.	3.a, 3.b, 3.d, 3.f
(3.) **Basic knowledge of manufacturing processes, engineering materials and their selection, measuring tools, machine tools, quality systems and processes,** process improvement methods, **economic principles, cost analysis techniques, and project management relevant to mechanical technology areas**	3.a, 3.b, 3.c, 3.d, 3.e, 3.f, 3.g
(4**.) Current software corresponding to good practice in the application of mechanical engineering technologies**. Software application functions to include: **word processing**, spreadsheet calculations, graphing**, presentation media**, **computer assisted drafting and manufacturing, manufacturing processes**, statistics, **data acquisition, project management**, and the **analysis and applied design of systems involving mechanisms, machines**, or fluid thermal processes. (Mathcad, Working Model, Dynacam, Solidworks)	3.a, 3.b, 3.c, 3.d, 3.f, 3.k

Course Topics	**Class Hours**
Course Introduction & overview	1
Design, Kinematic Fundamentals	3
Lab: Mechanical Mechanism Analysis, DOF, Classification, Grashof	
Graphical Linkage Synthesis	3
Lab: Linkage Synthesis – Working Model	
Position Analysis	3
Analytical Linkage Synthesis	3
Review, [Exam I]	2
Linkage Position Analysis	3
Linkage Velocity Analysis	6
Lab: Velocity Analysis – Motor/Piston Linkage	
Linkage Acceleration Analysis	6
Lab: Acceleration Analysis – Motor/Piston Linkage	
Review, [Exam II]	2
Cam Design/Analysis	5
Lab: Cam Design -	
Intro to Gears & Gear Trains	5
Lab: Gear Train Design – Amatrol Mechanical Bench	
Review, [Exam III]	
Final Exam	2
	2

Prepared by Manuel Gomez, 01/11/2011

Course Name and number: ET 365 "Building Utilities"

Credits & Contact Hours:3 credits (2+3p)- course 30 contact hours and Lab is 37.5 contact hours

Course Instructor: Anthony Hyde

Required Text Book - Code Check Complete: An Illustrated Guide to Building, Plumbing, Mechanical, and Electrical Codes (Code Check) by Redwood Kardon, Michael Casey, and Douglas Hansen (Hardcover - Sep 4, 2007) – Illustrated

Specfic course information: course is a required for students in the mechanical ET program and can be used as a technical elective for other ET program options. Course is an introduction and applications in design and code applications for mechanical, plumbing, electrical and HVAC systems for buildings and residents

- PREREQUISITES: Junior Standing in E T
- Course is required

Course Goals

- Students gain a general technical knowledge of electrical, plumbing, HVAC and Building systems
- Knowledge of site selection, building construction, residential house systems and commercial building considerations
- Thorough understanding of plumbing and electrical codes commonly used in residential and light commercial applications.
- Knowledge of building systems and HVAC systems

Course Outcomes

- ability to design a plumbing, electrical and heating system based on standard codes
- ability to interpret specific codes and stands for multiple applications.

- An ability to apply current knowledge and adapt to emerging applications of mathematics, science, engineering and technology;
- An ability to conduct, analyzes, and interpret experiments and apply experimental results to improve processes;
- An ability to apply creativity in the design of systems, components or processes
- An ability to function effectively on teams;
- An ability to identify, analyze and solve technical problems;
- An ability to communicate effectively;

ET 365 Building Utilities Course Topics

Site Selection: Location to from airport/interstate and rail yard, other
Location to and from utilities, electrical water and sewer

Construction: Green- sips, foam, ceb, adobe straw bail
How location and temperatures affect building
Houses- wood frame, metal frame, green

Residential home: Site selection and plot plan
Water, plumbing plan and sewer planning
Electrical plan
Heating and cooling a house

Commercial building: Electrical power options and considerations
Electrical usage and how you pay for electricity, peak loads
Sizing a panel box
Equipment layout in a building.

Building : Bracing, wall framing, roof and ceiling framing
Wall and roof coverings, attics, fireplaces and chimneys
Egress, windows, safety glass, pool barriers

Plumbing : Underground drains traps support tables
Vent terminals, water supply sizing
Gas piping, fixtures water heaters

HVAC : System and general requirements
Gas and related appliances. Venting and heaters
Appliances exhaust, other heating, radiant, combustion
Heat pumps, evaporative coolers

Electrical: Service, sizing,
Grounding, panels branch circuits, receptacles
Appliances, lighting wiring methods, boxes

Prepared by: Anthony Hyde **Date: 5/26/11**

Course Number and name: ET 381 Renewable Energy Technologies

Credits & Contact Hours: 3cr. Each week has two lectures of 75 min. Total semester contact hours are approximately 45 hr.

Instructor's name: Thomas Jenkins

Textbook: G. Masters, "*Renewable and Efficient Electric Power Systems*", Wiley, 2004
ISBN 0-471-28060-7
References: G. Boyle, "*Renewable Energy*", Oxford University Press, 2004

Specific Course Information:

g) Course Catalog Description - Renewable energy systems, including topics in thermal-solar, photovoltaic, wind, geothermal systems, and other current topics. Theory, practical applications, safety considerations and the economics of renewable energy systems compared to conventional systems.

h) Prerequisite – Math 121

i) This course is required for the ECET majors and can be used as a technical elective for MET, IET, and IET degrees

General Course Goals: The main goals and objectives of this class are:

- To learn the engineering and technology terminologies associated with renewable energy technologies (RET);
- To learn the engineering theory foundations which enable the generation of energy from RET sources;
- To gain an understanding of the cost-benefit ratio and economics of various RET compared to traditional sources;
- To understand some of the various obstacles associated with actual implementation of production and distribution of RET facilities in large and small scale systems;

To introduce social and environmental issues related to basic human needs and ideas of sustainability.

Related ABET Objectives and Outcomes: The department of Engineering Technology and Survey Engineering ECET option has an objective of having its graduates possess the following skills and knowledge.

a. an appropriate mastery of the knowledge, techniques, skills and modern tools of their disciplines; including:

1. Digital circuit analysis and design techniques, analysis of analog and digital electronics, architecture and applications of microcomputer systems, local area networks, **and the building, testing, operation and maintenance of electronic, instrumentation**, communications, control, and/or computer systems (both hardware and software). **Also ABET 2.b, 2.c, 2.d, 2.f**

4. **The use of** statistics and probability, transform methods, discrete and/or Boolean **mathematics, algebra**, trigonometry and/or calculus mathematics **in support of the analysis, design, and application of electronic, instrumentation, communications, control,** and/or computer systems.

Course topics and lecture hours devoted to each topic:

TOPICS	**HRS.**
• Review of electrical principles, current electrical production	2
• Solar electrical energy principles	9
• Wind energy production principles	9
• Biomass, Hydroelectric and Geothermal energy principles	9
• Social, political and economic issues	4
• Miscellaneous topics	4
• Tests and Quizzes, Review, Problem Solving and Examples	8

Laboratory Projects: In the past, this class had a weekly laboratory session. Beginning in spring 2011 the class has been modified to be 3cr. without a laboratory section. The material which has been in these labs has been incorporated into work sessions and moved to ET 382 and ET 384 classes (complementary classes).

There was approximately twelve laboratory sessions per semester with each laboratory replacing a lecture class of two hours and thirty minutes. Laboratory exercises are done in teams and in conjunction with the text readings and the lecture materials. The laboratories are designed to apply the theory of renewable energy technologies. A *formal* lab write-up is required by each group. **Equipment utilized by the students include (but not limited to):** Digital Multimeters, Oscilloscopes, variety of sensors (thermocouples, pyronometers, etc.), solar PV panels, wind turbines, batteries, and "balance of system" components.

Example of topics for laboratories in which a team component existed, included:

- Determine via calculations and direct measurements, the solar azimuth and elevation angles, tilt angles, and "predicted" (**calc**) solar insolation values for the time and day of the lab experiment (use 2:00pm local) – use your previously designed EXCEL spreadsheet. Look up the appropriate values in the text p618 (**table**) appendices for the closest date to the day of the lab – record for later comparison to calculated and test values.
- Go to the NMSU weather site (use the link above) and get the hourly weather data for the 1st five days in March 2009 from the Leyendecker station – note the wind readings at this location are taken at a **3m height**. Enter ONLY the necessary hourly data into an EXCEL spreadsheet – use the median values. Assume a wind turbine that is placed in the **grassy field** at this site has a **blade axis height of 50m** and **blade diameter of 10m**. Determine the **air density*, wind speed and wind classification, wind power at the hub height, and power generated by the turbine*** *(*Assume a **Betz limit** efficiency on your wind turbine). Calculate the power in the wind using the formula of $P = (.5 * \rho) * A * V^3$.

Prepared by: Thomas Jenkins **Date: 9/1/10**

Course Number and Name: ET 396, Heat Transfer and Applications

Credits & Contact Hours: 3cr., two weekly lectures of 50 min. each, and one weekly 2.5-hour laboratory session.
Total semester contact hours are approximately 55.

Instructor's name: Craig Ricketts
Textbook *title*, author, and year: *Heat and Mass Transfer – Fundamentals and Applications*, Çengel, Y. A. and Ghajar, A. J., 2011.
Supplemental materials: *Virtual Experiments in Food Processing*, Singh, R. P. and Erdogdu, 2009; *CyclePad*, a shareware application for simple heat exchanger analysis; and *Engineering Equation Solver*, *(EES)* of F-Chart Software.

Specific Course Information:

x. Course Catalog Description - Fundamentals of conduction, convection, and radiation heat transfer. Application of heat transfer, thermodynamics, and fluid mechanics principles to thermal system analysis and design.

y. Prerequisites – ET 306 Applied Thermodynamics and ET 308 Fluid Technology.

z. Laboratory – See information below.

aa. Augmenting – This is a required course in the MET curriculum.

Course Goals and Objectives:

Student understands the physical concepts and basic principles of the three heat transfer modes and becomes better proficient in applying relevant problem solving methods and tools of good practice. Student also becomes more familiar with the development and exercise of laboratory procedures and the processing, evaluation, and professional presentation of experimental data. Through all of the above, student gains additional experience in the application of the fundamentals that underlie the design, testing, and performance evaluation of thermal systems.

Related ABET Outcomes:

The **following** are the MET (x.) and ABET student outcomes that directly relate to Criterion 3. *An ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline;* to include:

(9.) **Application of** algebra, trigonometry, Boolean mathematics, **calculus**, statistics and probability, **fundamental principles and concepts of science and engineering technology**, **good practice in problem solving**, and **methods of standard practice in the analysis** and applied design **of mechanical systems**.
Also ABET 3.a., 3.b., 3.c., 3.d., 3.e., 3.f., and 3.k.

(2) **Implementation of** the fundamental aspects of AC and DC circuits, **electrical**

components, computer programming logic, instrumentation principles, **experimental techniques**, and **methods of standard practice, safety consciousness**, and **codes and standards** in the **testing** and **evaluation** of **mechanical systems**.
Also ABET 3.a., 3.b., 3.c., 3.d., 3.e., 3.f., and 3.k.

(4.) **The use of current software corresponding to good practice in the application of mechanical engineering technologies. Software application functions to include:** word processing, **spreadsheet calculations**, **graphing**, presentation media, computer assisted drafting and manufacturing, manufacturing processes, statistics, data acquisition, project management, and **the analysis** and applied design **of systems involving** mechanisms, machines, or **fluid and thermal processes**.

Also ABET 3.a., 3.b., 3.c., 3.d., 3.e., 3.f., and 3.k.

Course topics and class hours devoted to each topic:

Topics	**Class Hours**
· Introduction: field overview and significance, historical perspectives	1
· Units and basic definitions, heat transfer modes	1
· Forms of the heat conduction equation; boundary and initial conditions	2
· Steady-state heat conduction	3
· Transient heat conduction	2
· Numerical methods for analysis of heat conduction	2
· Fundamentals of convection heat transfer	2
· External forced convection heat transfer	1
· Internal forced convection heat transfer	1
· Natural convection heat transfer	2
· Boiling and condensation	2
· Fundamental of thermal radiation	2
· Radiation heat transfer	2
· Heat exchangers	4
· Examinations	0
· Topic Reviews	3

Prepared by: Craig Ricketts **Date**: 12/28/10

Course Number and name: ET 410 Senior Seminar

Credits & Contact Hours: 1cr. Each week has one lecture of 50 min.

Instructor's name: Jeff Beasley

Textbook: None:

Specific Course Information:
Course Catalog Description –

a) **Prerequisite –** Senior standing
b) This course is required for all CET majors.

General Course Goals:
Assist students with their job search and career decisions. Provide an understanding of the professional, ethical and social responsibilities they will have as an employee and good citizen. Inform and prepare students for life after graduation.

Related ABET Objectives and Outcomes: The department of Engineering Technology and Survey Engineering ECET option has an objective of having its graduates possess the following skills and knowledge.

(h) a recognition of the need for, and an ability to engage in lifelong learning
(i) an ability to understand professional, ethical and social responsibilities, and
(j) a respect for diversity and a knowledge of contemporary professional, societal and global issues

Course topics and lecture hours devoted to each topic:

TOPICS	**HRS.**
• Planning a job search: using the NMSU Placement and Career Services Office, the interview, using the Internet, networking, trends in industry, where NMSU/ET Alumni are and what they do.	**2 hr**.
• The first step in professional registration: the Fundamentals in Engineering Exam.	**2 hr**
• An ability to understand professional, ethical and social responsibilities.	**1 hr**
• Planning your career and your first year on the job, finding a mentor(s), professional development and continuing education after graduation, is graduate school in your future?	**1 hr**
• Professional and technical societies.	**1 hr**
• Knowledge of contemporary professional, societal and global issues, having respect for diversity.	**2 hr**
• Personal finances including buying a house, saving and investing for retirement, and buying insurance.	**1 hr**
• Exit interview for graduating seniors	**1 hr**

ET 410 Couse Schedule

Aug. 23	Introduction
Aug. 30	FE Examination – Kenny Stevens, Deadline to register is Sept. 1
Sept. 6	Labor Day
Sept. 13	Roseanne Bensley - NMSU Career Services
Sept. 20	no class, get your materials ready for the career fair

September 22 – Career Fair

Sept. 27	Becoming a PE - Sonya Cooper
Oct. 4	Job Search Plan – Prepare a job application for a company you would like to work for.
Oct. 11	Be prepared to discuss your 5-year goal after graduation
Oct. 18	Randy Rankin – Invertix
Oct. 25	Develop a financial saving goal
Nov. 1	What to do when "Murphy" comes out to play.
Nov. 8	Counseling Center
Nov. 15	TBA

Thanksgiving Break – November 22 - 26

Nov. 29	Last Class

Prepared by: Jeff Beasley Date: 12/21/10

Course Number and Name: ET 422, Mechanical Measurements

Credits & Contact Hours: 3cr., two weekly lectures of 50 min. each, and one weekly 2.5-hour laboratory session. Total semester contact hours are approximately 55.

Instructor's name: Paul Ricketts
Textbook *title*, author, and year: *Mechanical Measurements*, Beckwith, T. G.; Maragoni, R . D.; and Lienhard, J. H., 2004.
Supplemental materials: *Instrument Engineers Handbook – Process Measurement and Analysis*, Lipták, B. G, Ed., 2009 and *Measurement Fundamentals*, http://zone.ni.com/devzone/cda/tut/p/id/4523.

Specific Course Information:

bb. Course Catalog Description -
Techniques in mechanical measurements, including topics in experimental techniques, measurement devices and systems, data acquisition, data transmission, signal conditioning, data analysis, data verification, and report writing.

cc. Prerequisite – Senior standing in ET.
dd. Laboratory – See information below.
ee. Augmenting – This is a required course in the MET curriculum.

Course Goals and Objectives:

Student understands the physical concepts and basic principles of mechanical measurements and instrumentation. The student becomes knowledgeable in applying relevant problem-solving tools and techniques of good practice. Student also becomes more familiar with laboratory procedures and the processing, evaluation, and professional presentation of experimental data. Through all of the above, the student gains experience in application of the fundamentals that underlie the design, testing, and performance evaluation of mechanical measurement and instrumentation systems.

Related ABET Outcomes:

The **following** are the MET (x.) and ABET student outcomes that directly relate to Criterion 3. *An ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline;* to include:

(10.) **Algebra**, trigonometry, **Boolean mathematics**, **calculus**, **statistics** and **probability**, **fundamental principles and concepts of science and engineering technology**, **good practice in problem solving**, and **methods of standard practice in the analysis** and applied design **of mechanical systems**.
Also ABET 3.a., 3.b., 3.c., 3.d., 3.e., 3.f., and 3.k.

(2) **Fundamental aspects** of **AC and DC circuits**, **electrical components**, computer

programming logic, **instrumentation principles**, **experimental techniques**, and **methods of standard practice, safety consciousness**, **critical thinking skills** and **codes and standards** in the **testing** and **evaluation** of **mechanical systems**.
Also ABET 3.a., 3.b., 3.c., 3.d., 3.e., 3.f., and 3.k.

(4.) **Current software corresponding to good practice in the application of mechanical engineering technologies. Software application functions to include:** word processing, **spreadsheet calculations**, **graphing**, presentation media, computer assisted drafting and manufacturing, manufacturing processes, **statistics**, **data acquisition**, project management, and **the analysis** and **applied design of systems involving mechanisms, machines**, or **fluid and thermal processes**.

Also ABET 3.a., 3.b., 3.c., 3.d., 3.e., 3.f., and 3.k.

Course topics and class hours devoted to each topic:

Topics	**Class Hours**
· Course overview, the process and standards of measurement	1
· Evaluation and presentation of experimental data	2
· Measurement system response	2
· Sensors for measurement of physical variables	2
· Signal conditioning	2
· Digital techniques in mechanical measurements	1
· Readout and data processing	1
· Measurement of counts, events, and time	1
· Measurement of displacement	1
· Strain measurement and stress analysis	2
· Measurement of force and torque	2
· Measurement of pressure	1
· Measurement of fluid flow	2
· Measurement of temperature	2
· Measurement of acoustic parameters	1
· Data acquisition and signal processing	2
· Examinations	3
· Topic Reviews	2

Prepared by: Craig Ricketts, Coordinator **Date**: 12/30/10

Course No. and Tiltle: ET 402 Instrumentation

Credit Hours: 3 (2 + 3P)

Course Description: This course, taken by both electronic and mechanical students, introduces the student to the fundamentals of control systems theory and to the principles of signal conditioning and measurement for such systems.

Pre-requisites: ET 190 and senior standing **Required Course**

Textbook: Process Control Instrumentation Technology, 8th edition, by Curtis D. Johnson, Prentice Hall.

Objective: Introduction to the principles of control theory, measuring instrumentation, and signal conditioning

Note: This course relates to ABET program outcomes a, b, c, d, e, f, and g as follows:
(a, b) Theory is explained with mathematical derivations and supported by examples of practical applications.
(c, d) A number of lab experiments require the students to determine component values based on design requirements before running the experiments; they then verify if experimental results are as expected.
(e) All students work in teams in laboratory and projects.
(f) Students have to work on homework, exams, and lab problems.
(g) Students need to write lab reports using proper written language.

COURSE TOPICS:		**Hours:**
1.	Introduction to process control: Control principles, the process or plant, measurement, control loop, control element, block diagram.	1
2.	Control system response: Steady-state regulation, stability, transient response types.	2
3.	Analog and digital processing: Analog and digital data, data conversion, digital control loop.	1
4.	Systems of Units: The metric and English systems, basic and derived units, equivalencies and conversion of units.	1
5.	Analog signal conditioning: Principles, signal levels, linearization, bridge circuits.	3
6.	Operational amplifier circuits, gain, inversion, dc-level shift, differential circuits, instrumentation amplifiers.	3
7.	Digital fundamentals, binary numbers, octal and hexadecimal notation, Boolean algebra and theorems.	2
8.	Voltage comparators, voltage-level detectors, analog-to-digital and digital-to-analog converters.	3

9.	Thermal sensors: Thermal energy, temperature, temperature scales, temperature conversion formulas.	2
10.	Metal resistance versus temperature, linear and quadratic approximations, resistance-temperature detectors, signal conditioning for RTDs, thermistors.	2
11.	Thermocouples: Principle of operation, characteristics, types, millivoltage tables, change of reference, signal conditioning for thermocouples.	3
12.	Mechanical sensors: Displacement and position, level sensors, stress and strain, strain gauges and their signal conditioning.	2
13.	Pressure sensors: Static and dynamic pressure, pressure units, absolute and relative pressure, sensor types.	2
14.	Flow sensors: Flow units, flow types, pipe flow principles, restriction type sensors, flow-pressure relationships.	2
15.	Controller principles: Definitions, control parameters, controller modes.	3
16.	Continuous control: Control modes (proportional, integral, derivative, and composite), error, transient response.	3

Class/Laboratory Schedule

Class meets twice a week for 50 minutes each time. The laboratory session is 2.5 hours once a week.

Laboratory Practice:

Major topics in the course are extensively practiced in laboratory through experiments designed by the instructors. Students are required to write lab reports that include measurements, observations, and answers to questions. Typical electronic instruments in the laboratory include: CADET breadboard, TEKTRONIX digital oscilloscope, TEKTRONIX function generator, FLUKE digital multimeters. Lab session duration: 2.5 hours

List of Lab Experiments:

- Introduction to LabView
- Plotting Static and Dynamic Data with LabView
- A Self-Regulated Control System Simulation
- An Electronic Scale Simulation
- Inverting Voltage Comparator with Hysteresis
- A Simple 4-bit DAC
- Signal Conditioning for Thermocouples
- Simulation of a 2^{nd}-order Differential Equation
- Simulation and Verification of a Proportional Controller

Prepared by: Guillermo Rico Date: 10 December 2010

Course Number and Name: ET 426, Analysis and Design of Machine Elements
Credits & Contact Hours

Credits	Lectures	Lab	Contact Hours
3.0	(2) 50 min lectures/ week	(1) 2.5 hour /week	50

Instructors Name: Manuel Gomez

Textbook title, *Machine Elements in Mechanical Design (4th Ed*)
author and year: Mott, Robert L., 2004

Specific Course Description:

a. **Course Catalog Description** - Analysis of machine elements including columns, springs, shafts, coupling mechanisms, gears, belts and chain drives, clutches, brakes, and bearings.
b. **Prerequisites:** ET 310 (Applied Strength of Materials) and Math 236 (Calculus II)
c. This course is required for MET degrees.

Course Goals & Objectives: To familiarize students with how the fundamentals of applied strength of materials are applied to analyzing machine components, and to introduce additional advanced topics such as fatigue, tolerance & fits, fasteners, and the sizing of shafts for power transmission. Further, to familiarize students with the characteristics of machine components.

Related ABET Objectives & Course Outcomes: An ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline, to include the following:

Student Outcomes of Instruction from MET (x.)	Student Outcomes /Criteria 3
(1.) **Algebra, trigonometry**, Boolean mathematics**, calculus**, statistics and probability, **fundamental principles and concepts of science and engineering technology, good practice in problem solving,** and **methods of standard practice in the analysis and applied design** of **mechanical systems** as applied to analysis and design of machine elements.	3.a, 3.b, 3.d, 3.f
(3.) **Basic knowledge of manufacturing processes, engineering materials and their selection, measuring tools, machine tools, quality systems and processes,** process improvement methods, **economic principles, cost analysis techniques, and project management relevant to mechanical technology areas**	3.a, 3.b, 3.c, 3.d, 3.e, 3.f, 3.g
(4**.) Current software corresponding to good practice in the application of mechanical engineering technologies**. Software application functions to include: **word processing**, spreadsheet calculations, graphing**, presentation media**, **computer assisted drafting and manufacturing, manufacturing processes**, statistics, **data acquisition, project management**, and the **analysis and applied design**	3.a, 3.b, 3.c, 3.d, 3.f, 3.k

of systems involving mechanisms, machines, or fluid thermal processes.	

Course Topics	**Class Hours**
Machine Design Course Introduction	1
Mechanical Design/Materials in Machine Design	1
Lab: Introduction to MathCAD	2.5
Stress Analysis	2
Lab: Intro to Finite Element Analysis (FEA)/Solidworks	2.5
Combined Stresses and Mohr's Circle	1
Design for Different Types of Loading	1
Lab: FEA 1 and validate model using analytical solution	2.5
Columns, Test review	1
Lab: FEA 2 and validate model using analytical solution	2.5
Belt Drives and Chain Drives, Kinematics of Gears	2
Exam #1	2
Gear Design	1
Lab: Belt Drives and Chain Drives/ Amatrol Bench – design/build belt drive system and analyze input/output speeds	2.5
Keys, Couplings, and Seals	1
Lab: Gear Layout Analysis/ Solidworks	2.5
Shaft Design	1
Lab: Gear Analysis/ Amatrol Bench – design/build gear drive train and analyze the input/output speeds	2.5
Tolerance and Fits, Test Review	1
Lab: Shaft Design FEA with Solidworks	2.5
Bearings	1
Design Project Start (Design a Power Transmission Drive system to achieve the desired output speed. Use analytical analysis and solidworks to design all of the machine elements for the drive system. A technical report and powerpoint presentation are required. Work in teams of 3)	
Exam #2	2
Linear Motion Elements, Fasteners & Springs	1
Lab: Design Project continued	2.5
Machine Frames, Bolted Connections and Welded Joints	1
Lab: Design Project continued	1
Electric Motors	2.5
Lab: Electric Motor Familarization – Electric Motor Analysis Bench	2.5
Final Exam	2

Prepared by Manuel Gomez, 01/11/2011

Course Number and Name: ET 435, Senior Design and Project Management

Credits & Contact Hours: 3cr., two weekly class meetings of 50 min. each. Students also meet together once weekly in separate project teams for 2.5 hours. Total semester contact hours to include class meetings and instructor-attended team meetings are approx. 50.

Instructor's name: Craig Ricketts
Textbook *titles*, author, and year: *The Unwritten Laws of Engineering*, Skakoon J. G., 2001; *The Elements of Mechanical Design*, Skakoon J. G., 2008.
Supplemental materials: selected readings of contemporary global and societal issues as assigned.

Specific Course Information:

a. **Course Catalog Description** – Capstone course. Practical application of student's cumulative knowledge to assigned design project that requires implementation of standard analysis techniques and design principles, teamwork, and project management skills. Stresses the importance of codes, standards, and economics in design practice. Demonstration of student's written and oral communication skills via project documentation and presentation of results.
b. **Prerequisite** – status of graduating senior.
c. **Laboratory** – weekly, primarily self-directed, 2.5-hour meetings of separate project teams, with instructor present as needed.
d. **Augmenting** – This is a required course in the MET curriculum.

Course Goals and Objectives:

This is a team-based, project-oriented course that furnishes the challenges of meeting expectation for good practice in mechanical design and project management in a technical workplace. Design projects typically reflect those to be encountered in industrial settings. Students are expected to demonstrate a certain minimum level of technical competency, based upon completing the requirements of a mechanical engineering technology curriculum. Additionally, student work is employed to assess most of the department's outcomes for program assessment.

Related ABET Outcomes:

As **specifically pertinent** to the assigned senior design project and topics covered on the senior competency exam, 3.a – 3.k. and 9.a – 9.e typically reflect course outcomes.

Course topics and class hours devoted to each topic:

Topics	Class Hours
· Introduction: Overview, background, and significance of course	1
· Professional and ethical responsibilities and issues of safety	2
· Discussions of contemporary global and societal issues	2
· Relevant aspects of the design process in multiple contexts	3
· Brainstorming: guidelines, process, documentation, and participation in	3
· Resume guidelines	2
· Good practice in career fair participation	1
· Review of experiences following student career fair participation	1
· Guidelines for creating a portfolio and its function	1
· The basics in preparations for a successful interview	1
· Employment search presentation by NMSU Career Services professional	1
· Career guidance and planning discussions	3
· Aspects of good practice in short- and long-term professional development	2
· Project planning and management fundamentals and their implementation	3
· Good practice in project documentation: journals, progress and final reports	1
· Important aspects of quality, timeliness, and continuous improvement	1
· Implementation of standard industry practices/codes and standards	1
· Recognizing and drawing upon available resources toward project and career success	1
· Economic and cost analysis in project planning	1
· Generation of a project timeline; its function and significance	1
· Good practice guidelines for positive working relations with a client	1
· Oral presentations of proposed project goals and timeline by students	1
· Informal oral presentation of updates on project progress by students	4
· Midterm oral presentation of project progress by students	1
· Final oral presentation of project results by students	2
· Senior competency exam	1

Project-Team Meetings: Weekly, primarily student-directed, 2.5-hour meetings of separate teams, with instructor present as needed. Total semester hours of students in team meetings are approximately 45.

Tasks Addressed in Team Meetings:

All relevant aspects of technical project planning, implementation, and completion: typically to include brainstorming or communications with instructor, clients, mentors, and vendors; as well as calculations, coordination, documentation, product/vendor searches, fabrication, construction, and economic or cost analyses.

Prepared by: Craig Ricketts **Date**: 12/21/10

CE 450: Engineering Economy and Law

Credits & Contact Hours: 3 credit hours

Instructor's name: Andrew Daumueller

Textbook title, author, and year:

Basics of Engineering Economy, 1st Edition, Leland Blank and Anthony Tarquin, 2008

Specific Course Information:

a. Course Catalog Description:

Discounted cash flows, economics of engineering projects, contracts and specifications

b. Prerequisite
Senior Standing.

c. This course is required for all Undergraduate CE, GE, EE, and ET Programs

Course Goals & Objectives:

The objectives of CE 450 contribute to the objectives of the engineering program objectives. The course objectives are:

- To introduce students to the concept of the time-value of money and the effect that interest rates have on present worth and future cash flows (Skills)
- To provide techniques required to compare the relative economics of alternative engineering projects (Skills)
- To introduce the concept of depreciation and its role in economics and taxation
- To introduce students to law, systems of courts, tort, and environmental law (Skills)
- To familiarize students with different types of contracts, contract bidding, and contract plans and specifications (Skills)
- To instill in students a sense of professionalism and engineering ethics (Skills)

COURSE REQUIREMENTS:

In this course, students are required to show competency in the following areas:

- Determining economic equivalence as a function of time and interest
- Distinguishing between nominal and effective interest rates
- Generating cash flow diagrams

- Performing a routine economic analysis of relatively complex systems of cash flow and depreciation on alternative pieces of equipment, manufacturing or construction techniques, or investments.
- Understanding the purpose of a code of ethics and the high ethical standard that is expected of a professional engineer.
- Possessing knowledge about construction contracts and bidding

Course topics and lecture hours devoted to each topic:

TOPICS	**HRS.**
Foundations of Engineering Economy (introduction and definitions)	2.00
Factors: How Time and Interest Affect Money	2.38
Nominal and Effective Interest Rates	1.25
Present Worth Analysis	3.50
Annual Worth Analysis	1.25
Rate of Return Analysis	2.50
Benefit/Cost Analysis and Public Sector Projects	1.25
Breakeven, Sensitivity, and Payback Analysis	1.50
Replacement and Retention Decisions	1.00
Effects of Inflation	0.80
Estimating Costs	1.50
Depreciation Methods	1.60
After-Tax Economic Analysis	1.70
Spreadsheet Solutions	0.75
Engineering Ethics	0.75
Contracts and Legal Considerations for Engineers	2.25

Prepared by: Andrew Daumueller **Date: 06/01/2011**

Syllabi for Math / Science Requirements

Course number and name: Math 190: Trigonometry and Pre-Calculus

Credits and contact hours: 4 credit, 5 contact hours

Instructor's or course coordinator's name: Dr. Amal Mostafa

Text book, title, author and year: Precalculus With Calculus Previews, Fourth Edition. Expanded Volume by Zill and Dewar, 2010.

b.other supplemental materials

Supplement materials on complex numbers and Euler's formula.

Specific course information

An emphasis on functions included trigonometric functions expressed in words, equations, graphs, and tables of values, especially logarithm, exponential and inverse functions. Also included are translation and composition of functions, absolute value and rational functions, root finding and applications of functions with a view toward the study of calculus. Above average symbolic manipulation skills are assumed as a prerequisite. Technical reading and writing are an important part of this course. Much of the material and activities are geared to preparing students with the prerequisite skills and concepts needed to succeed in calculus.

Prerequisites or co-requisites: The prerequisite is "having passed Math 121G with a grade of C or better." A student can also place into Math 190 via a combination of ACT scores and GPA or by performing well on the departmental Mathematics Placement Exam.

Indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program

It's a required course

Specific goals for the course: Specific outcomes of instruction, ex. The student will be able to explain the significance of current research about a particular topic.

Students will internalize fundamental algebraic, trigonometric, exponential, and logarithmic concepts necessary for success in calculus and be able to apply them in new situations.

Students will internalize fundamental algebraic, trigonometric, exponential, and logarithmic computational skills necessary for success in calculus and be able to apply them in new situations.

Students will use mathematics as a language for describing relationships and as a tool for solving problems.

Students will become better technical readers.

Students will become more comfortable and more skilled with oral and written communication of mathematical ideas.

Students will gain confidence in their ability to solve problems and will display greater endurance and less frustration when confronted with mathematical challenges.

Brief list of topics to be covered

- Inequalities, Equations, and Graphs (Absolute Value, Circles)
- Functions (Symmetry and Transformations, Quadratic Functions, Piecewise-Defined Functions, combining functions)
- Polynomials and Rational Functions(Division of polynomial functions, Zeros and factors of polynomial functions, real zeros of polynomial functions, rational functions)
- Trigonometric Functions
- Triangle Trigonometry
- Exponential Logarithmic Functions
- Conic Sections

Syllabi for Math / Science Requirements

Course Name and Number: Math 235 "Calculus for the Technical Student 1"

Credits & Contact Hours: 3 credits, 2.5 contact hours per week

Instructor: Debra Zarret

Textbook: "Technical Calculus with Analytic Geometry" 4th edition, Peter Kuhfittig, 2006

No supplemental materials

Specific Course Information:

Course Catalog Description

Intuitive differential and integral calculus with applications to engineering.

Pre-requisite: C or better in Math 190G.

This is a required course.

General Course Goals:

a. The primary goals for the student are to understand some basic concepts of differential and integral calculus, to appreciate the nature of their applications and to develop some facility in using such expressions in problem solving.

b. The students will know the definition of the derivative and the definite integral. The student will be able to compute derivatives and integrals of algebraic functions. The students will be able to apply what they have learned about derivatives and integrals in applications.

c. Limits, Definition of the Derivative, Derivative rules for Polynomials and other Algebraic Functions, Implicit Differentiation, Rates of Change, 1st and 2nd Derivative Tests, Optimization, Antiderivatives, Definite Integral, Fundamental Theorem of Calculus, Area, Means, Volumes of Revolution, Centroids, Work and Fluid Pressure.

Syllabi for Math / Science Requirements

Course Number and Name: Math 236, Technical Calculus II

Credits & Contact Hours: 3 credits, 3 hours/week

Instructor's Name: Marta Reece, mreece@nmsu.edu

Textbook: *Technical Calculus with Analytic Geometry* (Fourth Edition) by Peter Kuhfittig, Thomson Brooks/Cole, 2006.

Specific Course Information:

a) **Course Catalog Description –** A continuation and extension of the material in MATH 235.

b) **Prerequisite –** Grade C or better in Math 235, Technical Calculus I

c) This course is required for the CET majors

General Course Goals: The main goals and objectives of this class are:
The primary objective is understanding basic concepts of differential and integral calculus, appreciating the nature of their applications, and developing some facility in using them in problem solving.

Equipment: A scientific calculator capable of handling exponential and trigonometric functions is required. TI 89 calculator capable of symbolic differentiation and integration is recommended, however for testing purposes derivatives and integrals will be done by hand.

Grading will be based on: Four tests, 70% total
Problem solving assignments, 30% total
Letter grades will be assigned as follows: 90-100% A, 80-89% B, 70-79% C, 60-69% D, 0-59% F. A plus sign will be added to a passing grade with last digit 7 or better, a minus to grade with digits 2 or lower.

Tests: Each of the tests will go over material within that section. Specifically, there will be no cumulative final. The first three tests will not include material covered during the last class period before that test. If we get behind schedule, only the material covered will be on the test. Test date will not change.

Problem Solving Assignments will concentrate on new material. They may contain some review questions, but if so, these questions will be from that section of the course. Students will be expected to start work on assignments in class and finish them at home. All assignments will be due the following class period. Late work will be graded down 10% unless excused.

Redone work: Any work may be redone, but only once, and it will carry a 10% penalty. If this would result in a lower grade, the original grade will be kept. Redoing of tests will be done at the Testing Center and a chance to do so will need to be specifically requested by the student. New work on assignments has to be on a newly printed assignment sheet, available from the course website. It must contain some work on all problems done incorrectly or missed in the original and be stapled to it.

Absences: Students absent for a short period of no more than a week will be expected to make up the missed work within a reasonable time. Longer absences excused for well-documented reasons will be handled by prorating the appropriate grades or may in extreme cases lead to a grade of I (incomplete). Students absent one month or more prior to the mid-semester drop date will be dropped from the course for non-attendance unless they contact the instructor with explanation.

E-mail: Students are responsible for regularly checking their NMSU e-mail box or forwarding its contents to their current use address.

Prepared by: Marta Reece Date: 9/23/10

Syllabi for Math / Science Requirements

Syllabus: Physics 211: General Physics I; 3 Credits
Spring 2011 Semester
Meeting Time: M W F: 9:30-10:20am; Gardiner Hall, Rm. 230
Instructor: Dr. Jennifer Neakrase
Contact Information:
Office: Gardiner Hall, Rm. 259A
Office Hours: MWF 10:30 – 11:30 am or by appointment
Email: neakrase@nmsu.edu
Phone: 575-646-3428

Catalog Description: Non-calculus treatment of mechanics, waves, sound. Knowledge of simple algebra and trigonometry is required. Prerequisite: a C or better in MATH 120 or higher.

General Education: The Physics 211-212 sequence can only be used to satisfy the basic natural science General Education requirement if you also register for either PHYS 211L or PHYS 212L.

Core competencies: The course will expand several of your competencies, namely, the description of the process of scientific inquiry, how to solve problems scientifically, how to communicate scientific information, how to apply quantitative analysis to scientific problems, and how to apply scientific thinking to real world problems.

Textbook: James S. Walker, *Physics*, 4th edition, Addison-Wesley, 2010
with Mastering Physics access. ISBN: 9780321541635
CPS Response Pad (clicker): eInstruction, ISBN: 9781881483717
Course website: http://learn.nmsu.edu
Check the course webpage for solutions to past homework assignments, quizzes, and exams, announcements of review sessions and other important class related information.
You can also go to the Student Technology Help web page and the Student Resource tab on learn.nmsu.edu for additional information on NMSU Technology requirements.
Schedule: A ***tentative schedule*** is available through the class website on Blackboard.

Homework: Homework assignments will be handled through **Mastering Physics**, a web-based service. You will receive and return your homework by accessing
http://www.masteringphysics.com
Instructions how to use **Mastering Physics** are handed out separately. Homework assignments are accessible through **Mastering Physics** after each class period and due before 11:59pm on the day of the next class.
Homework extensions are at the discretion of the instructor and must be requested before the due date of a homework assignment. Requests for extensions after the due-date will not be granted.
Tests: Three exams ("midterms") will be given during the semester. The two exams with the highest grades (percentages) will count towards your course grade and the exam with the lowest grade (percentage) will be dropped. The final exam is comprehensive and will be given on 05/02.

You are only eligible for make-up exam(s) if you are on university business the day of an exam. Calculators may not be shared.

Grade Scheme: The letter grade earned in this class will be determined as follows:
A = 90.0% - 100%
B = 75.0% - 89.999%
C = 60.0% - 74.999%
D = 45.0% - 59.999%
F = 0.0% - 44.999%
Grade composition: Your lowest midterm grade will be dropped.
Class Participation 10%
Homework 25%
Midterm Grade #1 20%
Midterm Grade #2 20%
Final Exam 25%

University Policies: General university policies can be found in the NMSU Undergraduate Catalog and
on the NMSU web site: http://www.nmsu.edu/reference.html

Plagiarism: Plagiarism is using another person's work without acknowledgment, making it appear to be one's own. Any ideas, words, pictures, or other source must be acknowledged in a citation that gives credit to the source. This is true no matter where the material comes from, including the internet, other students' work, unpublished materials, or oral sources. Intentional and unintentional instances of plagiarism are considered instance of academic misconduct. It is the responsibility of the student submitting the work in questions to know, understand, and comply with this policy. Even with a citation, failure to put quotation marks around direct quotations also constitutes plagiarism, because it implies that the writing is your own. Material should either be paraphrased or clearly designated as a quotation. Note that replacing words with synonyms, changing verb tense or other minor alterations do not qualify as paraphrasing.
If no citation is given, then borrowing any of the following would be an example of plagiarism:

Prepared by: Jennifer Neakrase, 9/23/10

Syllabi for Math / Science Requirements

Physics I Lab: PHYS 211-M01 Spring 2010

Lab: Monday 11:30 AM – 2:00 PM Foster Hall, Room 145
Instructor(TA): Dilli Raj Paudyal, dpaudyal@nmsu.edu
Office Hours: Tuesday 4:45 – 5:45 PM and Wednesday 1:15 – 2:15 PM
Office: Regents Row 405
Coordinator: Chris Pennise, Regents Row Room 434, 646-4906, cpennise@nmsu.edu
Website: http://learn.nmsu.edu

Purpose: The purpose of this Physics laboratory is to illustrate the physical principles discussed in the Physics course, to gain skill in asking and answering scientific questions and in using scientific reasoning.

Materials: The laboratory materials you will need will be available on the course website as .pdf files. We will print out materials for lab 1. You are responsible for printing out your copy of the lab and the associated homework before you attend the lab. It is recommended you bring a calculator and come to class prepared to write.

Reading: It is strongly suggested you read through the lab handout before lab.

Course grade: Your lab course grade will be based on: **attendance/participation** (22%); **homework** (58%) and a *comprehensive* **final examination** (20%). Your lab grade is independent of your grade for the course. When calculating your overall lab grade, the lowest score on *one* lab will be dropped.

Attendance/Participation: Attendance and participation are essential components of the laboratory. We expect you to do all the labs and all the homework. You should tell your TA when you are done with the lab, they will check your work for completeness and may ask questions to ensure you understood what was intended. If you leave without checking with your TA, you will not get full credit for the lab.

A pretest will be given at the beginning of the lab. Although we will not grade these for correctness, they will be considered as part of your participation grade and thus in order to receive full credit you must make an honest attempt to answer the questions.

The apparatus used in the laboratory is generally only available when the experiment is scheduled. If you must miss a class, arrange with your instructor to attend another section during the same week. If you make up a lab in a different section, you must fill out a lab make-up form (available on the class web site) and have it signed by the TA whose class you attend. This form and the previous lab homework that is due will be returned to your TA so that your attendance can be recorded and homework graded. If there are *three incomplete* labs at the end of the semester you will be in *danger of failing* the lab.

Homework: Labs meet once a week, and all labs will require homework based on the lab. The homework for each lab will be turned in *one week later* and must be turned in at the *beginning* of the lab session. Missing a lab, does not change the previous lab's homework due date; therefore contact your TA as soon as possible to make arrangements to turn it in. Late homework will be accepted, but will be penalized appropriately. *No* homework will be accepted for labs you did not attend! The last lab homework will be turned in no later than April 30, 2010.

Academic and non-academic misconduct, including intentional and non-intentional plagiarism: For definitions please refer to the Student Code of Conduct. This information may be accessed through the web at: http://www.nmsu.edu/%7Evpsa/SCOC/misconduct.html

Equity: Feel free to call Jerry Nevarez, Director of Institutional Equity, at 575-646-3635 with any questions you may have about NMSU's Non-Discrimination Policy and complaints of discrimination, including sexual harassment.

Students with Disabilities: Feel free to call Michael Armendariz, Coordinator of Services for Students with Disabilities, at 575-646-6840 with any questions you may have on student issues related to the Americans with Disabilities Act (ADA) and/or Section 504 of the Rehabilitation Act of 1973. All medical information will be treated confidentially.

Below is a tentative schedule of topics. This schedule is also posted in the lab room and you can download a pdf copy from the course website.

Lab	Dates:	Topic
1	Week of January 25	Descriptions of Motion
2	Week of February 1	Acceleration in One Dimension
3	Week of February 8	Motion in Two Dimensions
4	Week of February 15	Forces
5	Week of February 22	Addition of Forces
6	Week of March 1	Newton's Second Law
7	Week of March 8	Energy
8	Week of March 15	Conservation of Momentum
	Week of March 22	Spring Break!
9	Week of March 29	Rotational Motion
10	Week of April 5	Torque
11	Week of April 12	Simple Harmonic Motion
12	Week of April 19	Standing Waves
	Week of April 26	Lab Final Examination

Syllabi for Math / Science Requirements

PHYS 212G: General Physics II Spring 2011 Department of Physics

Date and Time: 2:35 pm – 3:50 pm Tuesdays and Thursdays

Location: Gardiner Hall Room 230

Instructor: Dr. Michael DeAntonio
Office: Gardiner Hall Room 250
Phone: (575) 646-3707
Email: Use BlackBoard Email (http:/learn.nmsu.edu/)

Textbook

Walker, Physics w/Mastering Physics2, 4e
CPS RF Student Response Transmitter3, EInstruction
ISBN: 9781881483717
Concepts in PhysicsTM 1 electronic textbook – For each Section you will find...

Exam Materials
You will need 4 NMSU test score sheets (available at the campus bookstore) and a No. 2 pencil. For the 3 exams, and the final, please purchase the full page size blue and white test score sheet with 184 question lines (92 on each side) and which is labeled "New Mexico State University Test Score Sheet" on the top. You also will be asked to show a photo ID when you hand in your test score sheet at each exam. So bring your test score sheet, a #2 pencil, and an ID to each exam.

Concepts to be Covered

A tentative schedule of chapters to be covered from the Concepts in PhysicsTM 11 electronic textbook is shown below. Changes to lectures on this schedule will be posted on BlackBoard under Class Schedule. Note: The dates for the exams will not be changed unless an announcement is made in class at least one week prior to the exam.
11

Physics 212 (Charge) 2:35-3:50 26 27
Physics 212 (Electricity) 2:35-3:50 28 29 30 31
Physics 212 (Electricity) 2:35-3:50 2 3
Physics 212 (Electricity) 2:35-3:50 4 5 6 7 8
Physics 212 (Electricity) 2:35-3:50 9 10
Physics 212 Physics 212 (Exam 1) 2:35-3:50 11 12 13 14 15
Physics 212 (Electricity) 2:35-3:50 16 17
Physics 212 (Circuits) 2:35-3:50 18 19 20 21 22
Physics 212 (Circuits) 2:35-3:50 23 24

Physics 212 (Circuits) 2:35-3:50 25 26 27 28
Physics 212 (Circuits) 2:35-3:50 2 3
Physics 212 (Circuits) 2:35-3:50 4 5 6 7 8 Last Day to Drop with "W"
Physics 212 (Magnetism) 2:35-3:50 9 10
Physics 212 (Magnetism) 2:35-3:50 11 12 13 14 15
Physics 212 (Exam 2) 2:35-3:50 16 17
Physics 212 (Magnetism) 2:35-3:50 18 19 20 21
Physics 212 (Magnetism) 2:35-3:50 30 31
Physics 212 (Magnetism) 2:35-3:50
Optics) 2:35-3:50 6 7
Physics 212
(Optics) 2:35-3:50 8 9 10 11 12
Physics 212 (Optics) 2:35-3:50 13 14
Physics 212 (Optics) 2:35-3:50 15 16 17 18 19
Physics 212 (Optics) 2:35-3:50 20 21
Physics 212 (Exam 3) 2:35-3:50 22
Physics 212 (Final Exam Preview) 2:35-3:50 27 28
Physics 212 (Makeup Exam) 2:35-3:50 29 30
EXAM WEEK

Grading

The total percentages for each type of assignment are shown below. There are NO extra credit assignments. Grades will NOT be curved. Student's taking the course on an S/U basis must earn at least 70% to receive an S.

Homework 5%
Quizzes 10%
Worksheets 10%
3 Exams 20% ea. (total 60%)
Final Exam 20%

The letter grade assigned for a given total grade is12
12 All class final grades will be rounded to the nearest integer. (e.g. 79.5 = 80 = B and 79.4999... = 79 = C)
13 This part includes the final exam! Missing the final exam leaves out 30% of your grade and you cannot get higher than a C in the class!

A+ = 100-105 A = 90-99
B = 80-89 C = 70-79
D = 60-69 F = 0-59

If the student has completed ALL of the quizzes, homework, and exams, the final grade for the class will be the higher of the overall total grade13 or the final exam grade. All unexcused, missed assignments will be counted as a zero – no exceptions. Rules for proper excuses are given below in the section titled Missed Work.

Syllabi for Math / Science Requirements

Physics II Laboratory: PHYS 212-M01 Spring 2011

Lab: Wednesday 6:00 – 8:30 PM Gardiner Hall Room 108
Instructor (TA): TBA
e-mail address:
Office Hours: TBA
Office: Gardiner Hall Room
Coordinator: Chris Pennise, Gardiner Hall Room 207, 646-4906, cpennise@nmsu.edu
Website: http://learn.nmsu.edu

Purpose: The purpose of this Physics laboratory is to illustrate the physical principles discussed in the Physics course, to gain skill in asking and answering scientific questions and in using scientific reasoning.

Materials: *Tutorials in Introductory Physics* (with homework). We will provide you with any additional printed lab materials that you will need. It is recommended you bring a calculator and must come to class prepared to write.

Reading: It is strongly suggested you read through the lab manual beforehand.

Course grade: Your lab course grade will be based on: **attendance/participation** (20%); **homework** (60%) and a *comprehensive* **final examination** (20%). Your lab grade is independent of your grade for the course. When calculating your overall lab grade, the lowest score on *one* lab will be dropped.

Attendance/Participation: Attendance and participation are essential components of the laboratory. We expect you to do all the labs and all the homework. You should tell your TA when you are done with the lab, they will check your work for completeness and may ask questions to ensure you understood what was intended. If you leave without checking with your TA, you will not get full credit for the lab.

The apparatus used in the laboratory is generally only available when the experiment is scheduled. If you must miss a class, arrange with your instructor to attend another section during the same week. If you make up a lab in a different section, you must fill out a lab make-up form (available on the class web site) and have it signed by the TA whose class you attend. This form will be returned to your TA so that your attendance can be recorded. If there are *three incomplete* labs at the end of the semester you will be in *danger of failing* the lab.

Homework: Labs meet once a week, and all labs will require homework based on the lab. The homework for each lab will be turned in *one week later* and must be turned in at the *beginning* of the lab session. Missing a lab, does not change the previous lab's homework due date; therefore contact your TA as soon as possible to make arrangements to turn it in. Late homework will be accepted, but will be penalized appropriately. *No homework will be accepted for labs you did not attend!* The last lab homework will be turned in no later than December 3, 2010.
Academic and non-academic misconduct, including intentional and non-intentional plagiarism: For definitions please refer to the Student Code of Conduct, including the current University definition of plagiarism. This information may be accessed through the web at:
http://www.nmsu.edu/%7Evpsa/SCOC/misconduct.html.

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Students with Disabilities: Feel free to call Michael Armendariz, Coordinator of Services for Students with Disabilities, at 575-646-6840 with any questions you may have on student issues related to the Americans with Disabilities Act (ADA) and/or Section 504 of the Rehabilitation Act of 1973. All medical information will be treated confidentially.

Physics 212/216 Tentative Lab Schedule Spring 2011

Lab 1 Charge
Lab 2 Field and Flux
Lab 3 Electric Potential Difference
Lab 4 Circuits I
Lab 5 Circuits II
Lab 6 Magnets and Fields
Lab 7 Measurement of e/m
Lab 8 Magnets and Interaction
Lab 9 Faraday's Law
Lab 10 Plane and Curved Mirrors
Lab 11 Ray Diagrams and Convex Lenses
Lab 12 Interference and Diffraction
Lab Final

Syllabi for Math / Science Requirements

Course Number and Name: CHEM 110G Principles and Applications of Chemistry

Credits & Contact Hours: 4 credits, 3 hours/week-lecture, 2.5 hours lab/week

Instructor's Name: Dr. Sergei Smirnov and Dr. David Smith

Textbook: Chemistry in Focus: A Molecular View of Our World, by Nivaldo Tro, 4th Edition, Brooks/Cole, Cengage Learning, 2009.

Specific Course Information:

c) **Course Catalog Description –** A survey of the properties and uses of the elements and their compounds. In addition to classical chemistry, attention is paid to the materials from which consumer products are made, to the production of energy, and to environmental considerations.

d) **Prerequisite –** There are no prerequisites for this course.

e) This course is required for the CET majors

General Course Goals:

The student will:
• describe the process of scientific inquiry
• solve problems scientifically
• communicate scientific information
• apply quantitative analysis to scientific problems
• apply scientific thinking to real world problems

In CHEM 110, these objectives will be realized by stressing the applications of chemistry to the real world. Our hope is to help build a more scientifically literate citizenry for the future. This will be achieved through traditional assessments such as homework, quizzes and exams, but will also include opportunities of verbal expression of ideas through written laboratory and demonstration assignments.

LAB MATERIALS:
Goggles and proper clothing are required for all. Lab and demo materials will either be emailed to you or provided at the session, depending on the lab or demo being done. Please see Laboratory and Demonstration section for more safety requirements.

GRADING SCHEME:
Three hour exams and the final exam (15% each)… ……..……..…...60%
Attendance…….…....5%
Quizzes, assignments, participation …….……15%
Lab experiments.....10%

Demonstrations…….……10%

EXTRA HELP:
1. Both your lecture instructor and laboratory TA have posted office hours.
2. A list of tutors from the chemistry department, who can be hired for hourly fee, will be available in CB 100.
3. Supplemental Instruction Workshops, a one credit hour course, are available for enrollment. SI workshops are peer instructed and provide small group activities to help you master content and gain better study strategies. The workshop associated with CHEM 110G is listed as CHEM 103. They are first come/first served so register promptly!
4. The Student Success Center located on the second floor of Zuhl Library has free tutoring. Please
see them for a list of their tutoring hours.

EXAMINATIONS:
The three midterm exams will be given on Thursday nights from 7:30-9:00 pm as noted below. The exams will be given on the following dates, make sure that you are available during the exam times. THERE ARE NO MAKE-UPS !!!
Exam 1 Thursday September 16 7:30 – 9:00 p.m.
Exam 2 Thursday October 14 7:30 – 9:00 p.m.
Exam 3 Thursday November 11 7:30 – 9:00 p.m.
Final Exam Wednesday December 8 3:30 – 5:30 p.m.
NO EXAM SCORES WILL BE DROPPED! Exam keys will be posted at the end of the examination period. NO ELECTRONIC DEVICES OTHER THAN NON ALPHA-NUMERIC CALCULATORS WILL BE ALLOWED DURING THE EXAMINATION.
For each exam, you are required to bring with you:
_ a NMSU Test Score Sheet (4-columned, full-sized blue sheet)
_ a #2 (soft) lead pencil
_ your school ID (with photo)

Titles of Labs and Demonstrations.
Lab 1. Some Typical Chemical Reactions
Lab 2. Qualitative Analysis of Cations and Identification of Ions by Flame Tests
Lab 3. Solubility of Sodium Chloride in Water
Lab 4. Gas Laws
Lab 5. Acid-Base Neutralization and Titration
Lab 6. Equilibrium
Demo 2. Colloids
Demo 3. Water Purification: Removal of Salts
Demo 4. Chemical Kinetics
Demo 5. Polymers
Demo 6. Chemical Equilibrium and LeChatelier’s Principle

Appendix B – Faculty Vitae

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

1. Name

2. Education – degree, discipline, institution, year

3. Academic experience – institution, rank, title (chair, coordinator, etc. if appropriate), when (ex. 1990-1995), full time or part time

4. Non-academic experience – company or entity, title, brief description of position, when (ex. 1993-1999), full time or part time

5. Certifications or professional registrations

6. Current membership in professional organizations

7. Honors and awards

8. Service activities (within and outside of the institution)

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

10. Briefly list the most recent professional development activities

Name: Craig I. Ricketts, Dr.-Ing.

Education:

Dr.-Ing. Mechanical Process Engineering, Universität Karlsruhe †, 1992
MS Mechanical Engineering, New Mexico State University, 1981
BS Mechanical Engineering, New Mexico State University, 1974
† now *Karlsruhe Institute of Technology*

Academic Experience:

2004 – present Associate Professor, Engineering Technology and Surveying Engineering
Coordinator of the mechanical option program, 2006- present
1998 – 2004 Assistant Professor, Department of Engineering Technology and Surveying Engineering, New Mexico State University
1992 – 1998 College Assistant Professor, Department of Mechanical Engineering, New Mexico State University

Non-academic Experience:

1990 – 1992 Technical Consultant in Nuclear Safety, Karlsruhe, Germany
1985 – 1990 Staff Member, Karlsruhe Nuclear Research Centre, Karlsruhe, Germany
1982 – 1985 Guest Scientist, Karlsruhe Nuclear Research Centre, Karlsruhe, Germany
1976 – 1982 Research Associate, Mechanical Engineering Department, New Mexico State University
1974 – 1976 Mechanical/Electronic-Packaging Engineer, Garwood Development Laboratory, Las Cruces, NM

Certifications / Professional Registrations:

Engineer in Training Exam - State of New Mexico, 1975

Membership in Professional Organizations:

International Society of Nuclear Air Treatment Technologies
American Society of Mechanical Engineers *(ASME)* Sigma Xi
ASME Standards Committee on Nuclear Air and Gas Treatment *(CONAGT)*
Subcommittee on Filtration of ASME *CONAGT*
American Society for Engineering Education Tau Alpha Pi Tau Beta Pi

Honors & Awards:

ASME *Certificate of Acclamation*, Standards Committee of ASME *CONAGT*, 2010
ASME *Certificate of Appreciation*, Standards Committee of ASME *CONAGT*, 2009
Professor of the Year Award in Engineering Technology Dept., NMSU, 2005
Bromilow Award for Teaching, New Mexico State University (NMSU), 1998
Roush Award for Teaching, NMSU, 1996
Award for Most Valuable Professor in Mech. Engineering Dept., NMSU, 1994, 1995
German Patent No. 36 22 629, 1989 (with V. Rüdinger et al.)
Award for Best Paper at Nuclear Technology Conference, Karlsruhe, Germany, 1987 (with V. Rüdinger and J. G. Wilhelm)

Service Activities:

ASME Standards Committee on Nuclear Air and Gas Treatment *(CONAGT)*, 2007 – present
Subcommittee on Filtration of ASME *CONAGT*, 1990 – present
Project Technical Manager for creation of AG-1 Code Section FM, 2006 – present

Project Technical Manager for major revisions of AG-1 Code Sections FA and FG, 2005 – 2009
Project Team Member for routine revisions of AG-1 Code Sections FC and FK, 2005/08 – present

Publications:

Realization of Performance Specifications for the Qualification of High-Strength HEPA Filters; in Proceedings of 31st Nuclear Air Cleaning Conference, Charlotte, NC, 19-21 July 2010. (with A. Stillo and W. Cambo).

Realization of a Prototype Full-Scale Test Rig for the Qualification of High-Strength HEPA Filters; in Proceedings of 31st Nuclear Air Cleaning Conference, Charlotte, NC, 19-21 July 2010. (with R. Altamirano, A. R. Lucero, J. K. McNierney, J. R. Saulietis, and A. Toledo).

Toward Realization of Filter Performance Specifications for the Qualification of Higher-Strength HEPA Filter Units; in Proceedings of 30th Nuclear Air Cleaning Conference, Seattle/Bellevue, WA, 25-27 August 2008. (with W. Cambo and A. Stillo)

Sustainable Energy Technology Curriculum Components: A Model Methodology for Engineering or Engineering Technology Programs, T. W. Jenkins, C. I. Ricketts, and R. Foster, Sixth LACCEI International Latin American and Caribbean Conference for Engineering and Technology (LACCEI' 2008), Partnering to Success: Engineering, Education, Research and Development, June 4–6 2008, Tegucigalpa, Honduras.

Improving Air-Cooled Condenser Perf. in Comb. Cycle Power Plants; V. Gadhamshetty, N. Nirmalakhandan, M. Myint, and C. Ricketts; **Journal of Energy Engineering**, August 2006, v.132, no.2, p. 81-88.

Gaining Retention & Achievement for Students Program (GRASP): A Faculty Development Program,
J. McShannon, P. Hynes, N. Nirmalakhandan, G. Venkataramana, C. Ricketts, A. Ulery, and R. Steiner;
Journal of Professional Issues in Engineering Education & Practice, July 2006, v.132, no.3, p. 204-208. [1]

Specifications and a Prototype Test Apparatus for Qualification of High-Strength HEPA Filter Designs,
in Proceedings of 29th Nuclear Air Cleaning Conference, Cincinnati, OH, 17-19 July, 2006. (with P. H. Ricketts, and P. R. Smith)

The Evolution of a Capstone Design Course to Include Outcomes Assessment, in Proceedings of the 2006 ASEE Gulf Southwest Section Conference, Baton Rouge, LA, 15 - 17 March, 2006. (with P. H. Ricketts and L. Cox)

Number of Years in Service to Department: 13 years

Date Hired: 15 August 1998

Name: Manuel Gomez

Education

PhD, Mechanical Engineering, 1999, (all but dissertation)

-Dissertation Title: Acousto-Ultrasonic In-Situ Resin Cure Monitoring System (Patent)

M.S., Mechanical Engineering, 1991
M.A., Economics, emphasis on advanced statistical analysis, 1990
B.A., Economics, 1989
B.S., Mechanical Engineering, 1988

Academic Experience

2009 – present: Assistant Professor, Department of Engineering Technology and Surveying Engineering, New Mexico State University**,** Las Cruces NM
2002: Adjunct Faculty member, Department of Engineering Technology and Surveying Engineering, New Mexico State University, Las Cruces, NM (Taught course on 6Sigma)
1995-1999: College Professor, part-time, Department of Engineering Technology, New Mexico State University, Las Cruces NM, courses taught: Dynamics, Statics, Applied Mechanics, AutoCAD and C-programming.

Non-Academic Experience

2007- Jan 2009 Cummins Inc., Global Quality Manager / Six Sigma Project Leader
Duties included to managed/supervise four senior Manufacturing Quality Engineers to provide engineering quality support and functional excellence to Cummins Parts & Service Manufacturing worldwide, to include Juarez MX, San Luis MX, Memphis US, Cumbernauld UK, Sidney AUS, create a yearly workplan to improve product quality and lead the execution of the workplan to assure that all quality targets were achieved on-time and within the allocated budget. Also, to provide quarterly Quality business updates to upper management.

2004-2006 Cummins Inc., Parts & Service Six Sigma Master Black Belt
Duties included to mentor, coach, and conduct monthly project reviews for an average of 30 Cummins Six Sigma Belts per year, lead at least four DMAIC Six Sigma training launches per year with 25 students per launch, lead at least one business improvement project/year.

2002- 2003 Cummins Inc., Diesel ReCon JRZ/ELP Six Sigma Black Belt
Duties included providing Six Sigma Project Leadership and support to Cummins JRZ/ELP plants. This included identifying, scoping leading manufacturing Six Sigma projects.
Closed three Black Belt Projects for a combined annual savings of $1.3M per year.

1999-2002 Cummins Inc., Diesel ReCon, JRZ/ELP Engineering Technical Advisor
Duties included providing Engineering Support to the Product and Manufacturing Groups, lead cost reduction projects, lead the Cummins recruiting team for UT Austin.

1995-1996 Rosenburg Detenographics, Las Cruces NM Design Engineer, Consultant Worked with a team of engineers from NMSU to design and fabricate a wind powered "Clock of Dreams" Public Art Project

1994 Los Alamos National Laboratory, Los Alamos, NM, Engineering Assistant
Supported a team of structural engineers to design and build the world's first all composite satellite structure, "FORTE".

1992-1993 New Mexico State University, Las Cruces NM, Research Specialist
Duties included: Fabricate composite samples, Conduct research on nondestructive testing of composite materials, instruct and supervise students on using lab equipment.

Certifications/Professional Registrations

Cummins 6Sigma Certified Master Black Belt, Black Belt, Green Belt, & Project Sponsor.
Cummins Certified Project Manger
Certified/Trained in ISO/TS – 16949, 2005
Recipient of U.S. Patent 5911159, Resin Cure Monitoring

Membership in Professional Organizations

ASQ: American Society of Quality
ASEE: American Society for Engineering Education
ASME: American Society of Mechanical Engineering

Honors and Awards

Cummins "Million Dollar" status for achieving >$1M in Six Sigma project savings. 2004
NASA Doctoral Graduate Fellowship, 1993-1996
Los Alamos National Laboratory Graduate Researchers Assistantship, 1994
NACME, National Action Council for Minority Engineers Scholarship, 1982

Service Activities

Resumania- Resume Reviewer, 2009-2010
New Mexico Alliance for *Minority* Participation, (AMP), Poster Judge, 2009-2010
Project Lead the Way (PLTW) NMSU Affiliate Professor
Member of NMSU ETSE Recruiting Committee
NMSU Chapter Society of Professional Engineers (SHPE) Faculty Advisor, 2010

Publications/Presentations

What is Six Sigma, Presentation NMSU, 2009
Effective Communication/Presentation Skills, Workshop to NMSU ETSE students, 2010

Professional Development Activities

ABET Symposium on Assessment Processes, Las Vegas Nevada, April 15-17, 2010,
Project Lead the Way, Affiliate Professor Training (Aerospace), June 7-11
How to Beat the Lecture/Textbook Trap, NMSU Teaching Academy, March 17, 2010
Faculty Mentoring Program: Work/Life Integration for Faculty, Thursday, March 11, 2010
New Faculty Orientation to Assessment, NMSU Teaching Academy, January 8, 2010
I-Clicker Demonstration for Classroom, NMSU Teaching Academy, December 9, 2009
Participation in Faculty Mentoring Program, NMSU Teaching Academy, September 2, 2009

Number of Years in Service to Department: 2 years

Date Hired: August 1999

Name: Anthony M. Hyde

Education: *B.S.* in *Engineering Technology - Mechanical Program*, New Mexico State University, December 1985.
M.S. in Manufacturing *Engineering*, University of Texas at El Paso, May, 1991.

Academeic Experience

Director (75%): Manufacturing Technology and Engineering Center 8/2000- present
Responsible for the management and operation of a state funded organization housed with-in the College of Engineering at New Mexico State University. Organization's primary objective is to help develop the manufacturing and business sector in New Mexico through technical assistance, training and outreach activities. M-TEC provides business and industry with specialized training, technical advice and training along students with manufacturing experience.

Professor (25%): Department of Engineering Technology, New Mexico State University 2006-Present. Teach one course per semester including ET 101, 217, 305, 365, 415.
***Associate Professor* and Manufacturing Program Coordinator**. 5/96-8/2005.
Department of Engineering Technology, New Mexico State University.
Responsible for curriculum and course development along with course and laboratory instruction. Taught freshmen through senior courses in the areas of manufacturing and mechanical engineering technology. Course areas include manufacturing history, manufacturing processes, computer aided manufacturing, computer aided drafting, manufacturing management and productivity, static's, introduction to mechanical engineering technology and production and assembly.
Assistant Professor *8/91-5/96,*
Same basic duties as above.
Manufacturing Processes Lab Instructor, Department of Engineering Technology, New Mexico State University, August 1986 - June 1990. Taught Lab which is 2.5 hours a week approximately 4 times a week with 20 students in each lab. Lab included sand casting, machining, fabrication and general shop safety and instruction.

Non Academic Experience

Supervisor - Manufacturing Lab/Machine Shop, Department of Engineering Technology, New Mexico State University, August 1986 -1991 Supervisor of all aspects of Manufacturing Laboratory. Responsibilities included overall supervision, project management, instruction, machining, maintenance fabricating and prototype work. Manufacturing Laboratory used for teaching and support of research and student projects.
Manufacturing Engineer - General Motors Corporation, Buick City Assembly Plant, Flint, Mich. Summer 1995. Project Manager in Manufacturing Engineering/Quality control. Responsible for suggesting corrective action for problems in the assembly of automobiles. Also hired for the implementation of computer controlled tooling system to control torque on power tools. Quality assurance and evaluation of assembly systems on dash and instrument cluster of automobile.
***Mechanical/Manufacturing Consultant*:** 1990 - present. Rockwell International, General Motors, Advanced Manufacturing Center, Naval Research Center, Modern Cooling Systems, and National Institute of Standards and Technology, and the Carlsbad Economic Development agency. Consulting areas: product design and development, training programs, new production setup, jig and fixture design, design for manufacturability, and quality and methods improvement.

Certifications:

Certifed in PLTW-Engineering Design and Develp. 2009 PLTW School Certifier 2010
Certified Level 1 – Solidworks "Basic" 40 training -2008
Certified in Economic Development I. 2005
Certified – Geometric Dimensioning and Tolerancing – 40 hour training.1999
Certified Manufacturing Engineer, 1994.
Certified Manufacturing Engineering Technologist,
1993. Fundamentals of Engineering Exam, 1986.

Societies American Society of Engineering Educators **(ASEE)**
Society of Manufacturing Engineers (SME)
American Society of Agricultural and Biological Engineers (ASABE)

Honors and awards

- Dean's Award of Excellence for Senior Faculty - 2010
- NMSU College of Engineering "Faculty of the Year Award"- 2004
- Manufacturing Educator of the Year. Society of Manufacturing Engineers-2001
- Excellence in Mentoring Awards-1995-2003, NMSU AMP Program

Service Activities-

University Affiliate Director: Project Lead the Way in New Mexico; 2007-Present. Responsible for Teacher and School Certifications, Administrators/ councilor and teacher conferences- other miscellaneous activities

Principal publications of last five years

- ASABE 2010– Pittsburg, Pa- International Conference on American Society of Agricultural and Biological Engineers- Presenter/Paper- "Designing of a High Production Chile Destemmer"
- ASEE National Conference- Paper/ Presenter- "A Bridge to Somewhere, Creating STEM Pathways in New Mexico Higher Education". Austin Texas, 2009
- ASEE/CIEC Conference- March 2009 –Orlando Florida-ASEE Conference on Industry and Education Collaborations- Presenter/Paper – "Changing the STEM Landscape in New Mexico through Community Colleges".
- "Using Visual Aids to Improve the Instruction of Manufacturing Process," coauthored with Julieta -Valles-Rosales, Christopher Hoy, Leon Cox, IEEE Conference, Houston, May 2005 **.**

Professional Development

- Attended Regional Meetings for Texas A&M Engineering Extension
- Solidworks Basic Course, Taught Short Courses,
- PLTW National Conferences 2007- Presnter, ASEE Regional Conferences, CIEC Conferences, Director- National Affiliate Directors meter held at this conference, American Society of Agricultural and Biological Engineering Conferences.

Name: Kenny A. Stevens

Education: New Mexico State University:

- MS in Civil Engineering w/ emphasis in Water Resources, May 1990
- BS in Civil Engineering, May 1983
- BA in Spanish (Minor in French), May 1983
- **Foreign Student Associate's Degree, University of Salamanca, Spain, 1979**

Academic Experience

- Associate Professor & Program Coordinator, 2005 - present
- Assistant Professor, 1999-2004
- Instructor - Department of Civil Engineering, 1991-1995
- Graduate Teaching Assistant - Department of Civil Engineering, 1988-1990

Non Academic Experience

- Co-owner, Triple-S Well Drilling Services, Las Cruces, New Mexico, 2003 – 2006
- Project Engineer, Southwest Technology Development Institute, Las Cruces, New Mexico, 1997-1999
- Project Engineer, CARE International, Mozambique, SE Africa, 1995-97
- Staff Engineer, George V. Sabol Consulting Engineers, Denver, Colorado, 1990-91
- Field Engineer, New Mexico Dept. of Energy, Minerals, and Natural Resources, Las Cruces, New Mexico, 1989
- Training Consultant, Peace Corps, Ecuador, S. America, 1987-88
- Project Engineer, Peace Corps, Ecuador, S. America, 1984-87

Professional Registration

- Registered Professional Engineer, State of New Mexico
- Licensed Well Driller, State of New Mexico
- Certified Concrete Testing Technician, American Concrete Institute

Membership in Professional and Scientific Societies

- Member: American Society of Civil Engineers
  - Vice President of Southwestern New Mexico Branch, 2001
  - Corresponding Member for the Body of Knowledge Committee, 2002-2003
- Member: American Society of Engineering Education
- Member: Engineers Without Borders USA
- Member: New Mexico Ready Mix and Aggregate Association

Honors and awards

- Received Roush Award for Teaching Excellence in the College of Engineering, NMSU, 2000 & 2009
- U.S. Coast Guard Academy Appointment Tendered
- Received B.S. and B.A. with Honors
- Completed fourteen marathons, five ultra-marathons and thirteen triathlons

- Climbed four mountains over 20,000 feet
- Nominated for Peace Corps Volunteer of the Year in Ecuador

Current Service Activities:

Advisor

- Curriculum Advisor
- Student Advisor – ASCE
- Student Advisor-Engineers Without Borders
- Student Advisor – Associated General Contractors

Committees

University

Mexico-US University Task Force

College, Team Chair – Service Learning and Outreach**,** Masters Committees

Department, Recruitment, Renewable Curriculum Development**,** Civil and Mechanical Program Search Committees

Service outside the university

Associate Editor – Concrete Canoe Magazine

Extra-Territorial Zoning (ETZ) Ad-Hoc Committee on Regulations and Zoning

Consultant to Colonias Development Council on Engineering Issues

Publications:

The Mysteries of the Oral Presentation, Kubinski, H., Chapler, M., Cline, M., and Stevens, K., Concrete Canoe Magazine, Spring 2008

Distillate Water Quality of a Single-Basin Solar Still, Hanson, A., Zachritz, W., Stevens, K., Mimbela, L., Polka, R., and Cisneros, L., Solar Energy, January 2004

Learning: It's Not Just for Breakfast Anymore, Changes in the Civil Engineering Technology Program at NMSU, Stevens, K., Cooper, S., 4th Annual Science, Engineering & Technology Education Conference Proceedings, Las Cruces, NM, January 2002

Estimation of Runoff and Sediment Yield in Albuquerque, NM, Using Rainfall Simulation: Ward, T.J. and Stevens, K.A., Watershed Management 2000, ASCE, p. 105, July 2000

Modeling Erosion and Transport of Depleted Uranium, Yuma Proving Ground; Ward, T.J. and Stevens, K.A., New Mexico Water Resources Research Institute Technical Report 286, June 1994

Sewage Sludge Application in Semiarid Grasslands: Effects on Vegetation and Water Quality; Aguilar, R., Loftin, S.R., Ward, T.J., Stevens, K.A., and Gosz, J.R., New Mexico Water Resources Research Institute Technical Report 285, April 1994

Estimating Watershed Runoff from Lightning Data—A Case History; Ward, T.J., Stevens, K.A. and Bolton, S.M., Proceedings: Management of Irrigation and Drainage Systems, ASCE, July 1993, p. 327-334

Professional Development:

- ASCE State Section Conference, Ruidoso, NM 2009, Socorro, NM 2008, Las Cruces, NM 2007.
- Quality Concrete School, Las Cruces, NM 2005-2009

Number of Years in Service to Department: 12 years

Date Hired: 1999

Name: Ruinian Jiang

Education:

Ph.D. in Civil Engineering at New Mexico State University, Las Cruces USA (2005)
M.S. in Civil Engineering at the University of New Mexico, Albuquerque, USA (1998)
B.S. in Civil Engineering, Hunan University, China (1984)

Academic Experience:

August 2006-Present, Assistant Professor, the Department of Engineering Technology and Surveying Engineering, New Mexico State University, Las Cruces

January 2005-August 2006, Specialist and Instructor, the Department of Civil Engineering, New Mexico State University, Las Cruces

August 2001-December 2004, Graduate Teaching/Research Assistant, the Department of Civil Engineering, New Mexico State University, Las Cruces

August 1999-August 2001, Research Assistant, the Department of Civil Engineering, the University of New Mexico, Albuquerque

Non-academic Experience:

October 1997-August 1999, Executive Director, The Patent Services Center of the Ministry of Transportation of China

September 1996-September 1997, Project Manager, China Academy of Transportation Sciences, Slope Protection and Landscaping Project, Chuxiong-Dali Freeway Construction, Yunan Province, China (about 100 miles)

March 1995 – September 1996, Chief Engineer, China Overseas Engineering Cooperation, National Road Overlay and Improvement Project, Contract No.2, Bangladesh (about 60 miles); Asian Development Bank Loan Project

March 1993 – February 1995, Assistant Project Manager and Associate Chief Engineer, China Overseas Engineering Cooperation, National Road Improvement Project, Contract No.10, Bangladesh (about 20 miles); Asian Development Bank Loan Project

January 1991 – February 1993, Team Leader, the Information Research Institute of the Ministry of Transportation of China

August 1984 – December 1990, Research Engineering, the Information Research Institute of the Ministry of Transportation of China

Membership in Professional Organizations:

American Society for Engineering Education
American Society for Civil Engineers

Honors & Awards:

Patricia Chrismore Teaching Award, NMSU, 2009 – 2010
Professor of the Year, Dept. of Engineering Technology and Surveying Engineering, 2009
Best Research Product of 2004, New Mexico Institutes of Higher Education, New Mexico Department of Transportation
Outstanding Academic Achievement, Graduate School, New Mexico State University, 2004/2005
Best Research Product of 2001, New Mexico Institutes of Higher Education, New Mexico Department of Transportation
Innovative Research on Transportation Design, Institute of Alliance of Transportation Research, University of New Mexico, 2001
Excellent Research Product, China Society of Highway and Transportation, 2000

Service activities:

Co-advisor, Association of General Contractor NMSU Student Chapter, since 2006
President, American Society of Civil Engineers (ASCE) Southern Branch of New Mexico, 2007 – 2009
ETSE students advising, Graduate committees, Mentoring for the minority students and students with disabilities, etc.

Publications:

Jiang, R., Jauregui, D., "Development of a Digital Close-Range Photogrammetric Bridge Deflection Measurement System." Measurement: Journal of the International Measurement Confederation, 2010, in press, available on-line.

Jiang, R and S. Cooper, "A Dilemma in Engineering Class Design Project", Journal of Technology Interface, Spring 2009

Jiang, R, Jauregui, D, and White, K, "Close-Range Photogrammetry Applications in Bridge Engineering: Literature Review." Measurement: Journal of the International Measurement Confederation, 41, 823 -834, 2008.

Jiang, R and Jauregui D, "A Novel Network Control Method for Photogrammetric Bridge Measurement" Journal of Experimental Techniques, May / June, 2007, 48 -53.

Jiang, R, Lowe, E, and Du, H, "Effect of Fibrillated Polypropylene Fiber Reinforcement on Concrete Behavior", Journal of Technology Interface, Fall 2007.

Jiang, R., "Life-Cycle Integrated Capstone Project Design" Proceedings of the First National Capstone Design Conference, Boulder, 2007.

Jauregui D; Tian Y, and Jiang R, "Photogrammetry Applications in Routine Bridge Inspection and Historic Bridge Documentation," Journal of Transportation Research Record, No. 1968, 24-32, 2006.

Jiang, R, Jauregui, D, and White, K, "Review of Close-Range Photogrammetry Applications in Bridge Engineering." Proceedings of the 85th Annual Conference of Transportation Research Board, Washington, D.C., January 2006.

Ruinian Jiang, White, K. R., and Albright, D. P. "Development of Integrated Transportation Design Curriculum." Proceedings of the 84th Annual Conference of Transportation Research Board, Washington, D.C., January 2005.

Professional Development:

Participating in online and NMSU campus courses/workshops and association activities.

Number of Years in Service to Department: 4.5 years
Date Hired: August 2006

1. **Name:** Sonya Leigh Cooper

2. **Education:**
   - Doctor of Philosophy (June 2000), New Mexico State University. Materials Science.
   - Master of Engineering (May 1984) University of Virginia. Civil Engineering: Structural Option. Graduate Teaching Assistant.
   - Bachelor of Science (May 1982) North Carolina State University. Civil Engineering: Construction Option. Graduated Cum Laude, Member Chi Epsilon, Tau Beta Pi Honor Societies.

3. **Academic Experience:**
   Professor, August 2010-present
   Department Head and Professor, Jan. 2006-June 30, 2010
   Interim Department Head, Jan. 2005 – Jan. 2006
   Associate Professor & Program Coordinator, 1999 – Dec. 2004

   Assistant Professor, 1994 - 1999

   Graduate Teaching Assistant, University of Virginia, 1983-84

4. **Non-Academic Experience:**
   -US Army Community and Family Support Center, Project Manager, Washington DC 1992-1994.
   -Lucon Construction Company, Manager, Annandale VA 1991-1992.
   -Mastermind Enterprises, Owner, Arcola VA 1990-1991.
   -Leo A. Daly A/E, Structural Engineer, Washington, DC 1989-1990.
   -Rinker-Detwiler & Associates P.C., Civil Engineer/Project Manager Manassas, VA 1985-1989.
   -Consulting and In-kind Work (continuous since 1994) in historic preservation, structural analysis and design, land development, construction engineering, and infrastructure.

5. **Professional Registration:** Registered Professional Engineer in New Mexico

6. **Membership in Professional and Scientific Societies:**
   Member: American Society of Civil Engineering
   Vice President: ASCE New Mexico Section
   Member: American Society of Engineering Education
   Member: Associated General Contractors

7. **Honors and awards**
   Selected as ASCE CTC&A officer and member 5 years
   Selected as ABET Inc. Commissioner 5 years
   Selected as ASCE NM Section officer (in 2nd year of 5 year term)
   Selected as Board member for two 501-3c non-profit organizations

8. Current Service Activities:

Advisor/Mentor Service

- Curriculum Advisor
- Crimson Scholar Advisor
- Student Advisor – ASCE student chapter
- Student Advisor-Associated General Contractors student chapter
- Student Advisor-Engineers Without Borders
- Student Advisor-NMSU Lady Chiles Rugby Club
- Junior and Senior Faculty Mentor (formal arrangements)

Committees

University

Doña Ana Community College: Civil Drafting Advisory Committee
Assessment Committee

College

Chair – Engineering Extension Development Committee
College P & T Committee
Assessment Committee
Masters and PhD Committees

Department

Recruitment
P&T Committee
Surveying Search Committee

Service outside the university

- Have offered in-kind engineering and construction services for over 50 projects since 2005
- Member on two Boards: Amador Hotel Foundation, Mesilla Valley Preservation
- Chair of the New Mexico Report Card Initiative

9. Publications

Cooper, S.L., *Socorro Mission Preservation Project,* Proceedings of the Texas Section of the American Society of Civil Engineers, El Paso, Texas. October 8, 2010.

Cooper, S. and Jiang, R. *A Dilemma in Engineering Class Design Project,* http://technologyinterface.nmsu.edu/Spring09/

Cooper, S.L., and K. Stevens, *Learning: It's Not Just for Breakfast Anymore, Changes in the CET program at NMSU.*

Cooper, S.L., *A Project Delivery Technique for Historic Structures: A Case Study,* Proceedings of the 2002 American Society for Engineering Education Annual Conference & Exposition. Copyright © 2002, American Society for Engineering Education.

10. Professional Development:

Attended ASCE Regional and State Conference technical sessions 2008, 2009, 2010
Attended EAC/ABET Evaluator Training, 2000, 2005, 2010
Attended TC2K TAC/ABET Evaluator Training, Baltimore, MD, October 2004
Attend seminars for consulting work on materials and construction methods
Attend training seminars on scheduling and estimating software used in classes

Number of Years in Service to Department: **Date Hired:** 15 August 1998

Name: Carmen C. Boje

Education:

Ph.D. in Industrial Engineering at New Mexico State University, Las Cruces USA (In Progress)
M.S. in Computer Networks and Multimedia from the Polytechnic University of Turin (1998)
M.S. in Electronic Engineering from the Polytechnic University of Turin (1997)
M.S. in Electronics and Telecommunications Engineering from the Polytechnic University of Bucharest (1985)

Academic Experience:

January 2007-Present, College Associate Professor, New Mexico State University, Las Cruces

August 2006-December 2006, Adjunct Faculty, Ivy Tech College Fort Wayne, Mathematics Department

August 2004-June 2006, Visiting Assistant Professor, Indiana University Purdue University Fort Wayne

September 2001-June 2004, Assistant Professor, Indiana University Purdue University Indianapolis

1995 to 2001 Professor, European Center for University Training and "Radio-Elettra" Studies Center

1988-1992 Assistant Lecturer and Laboratory Engineer, Polytechnic University of Bucharest

Non-academic Experience:

1997-2001 Technical Writer and Software Validation Engineer, ARTIS Software Corporation in Turin, Italy – Full Time

1994-1995 International Business Consultant, SOGES S.p.A. in Turin, Italy – Full Time

1992-1993 International Business Consultant, CGM International S.p.A. in Milan, Italy – Full Time

1987-1988 Telecommunication Engineer, Center of Research for Technological Engineering and for Telecommunications Instruments in Bucharest, Romania – Full Time

1985-1987 Project Engineer, Equipment Research Enterprise (IAUC) in Bucharest, Romania– Full Time

`Membership in Professional Organizations:

American Society for Engineering Education

Honors & Awards:

Distinguished Member 2009-2010, Teaching Academy, April 2010

Service activities:

ETSE students advising, ETSE departmental meeting participation,
Teaching at NMSU "Mathematics applied in Electronics Engineering" for Las Cruces high school students, summer 2007, Volunteering for different activities organized by Salvation Army in Indianapolis and Fort Wayne, 2003-2006

Publications:

"How Do We Provide an International Experience for Undergraduate Technology Students at Regional Campuses?" Iskandar Hack, Carmen Boje (ASEE Chicago Conference, June 2006)

"The Evolution of Digital Divide in Europe" Carmen Boje, Gary Stephen and Nicolae Dragulanescu (ASEE Fort Wayne Conference, April 2006)

"Higher Standards for Online Education" Carmen Boje (the sixth annual Teaching Online in Higher Education online conference, Nov 2004)

"Epistemological Approach of Information Concept within Different Disciplines" Carmen Boje, Nicolae Dragulanescu (ASEE Salt Lake City UT, June 2004)

"Digital Divide in Eastern European Countries" Carmen Boje, Nicolae Dragulanescu (ASEE Nashville TN, 2003),

"The Technique of Transmission with Priorities" Carmen Palalau, Rodica Stoian (Transport and Telecommunications Journal – Bucharest, 1987)

"Data Transmission models with priorities, based on the Queues Theory" Carmen Boje, (Session of Scientific Communications for Electronics, organized by Electromagnetic Industry – Poiana Brasov – 1988/1989)

Artifex 4.2. and 4.3 Users Manuals 1997-2001: Getting Started , Installation Guide, Modeling Guide, Validating Guide, Deploying Guide, Reference Manual
OptSim Users Manuals review 1997-2001: User Manual, Components Library

Professional Development:

Participating in online and NMSU campus courses/workshops and training related to software, mathematics, statistics, electronics, and telecommunications.

Number of Years in Service to Department: 3.5 years
Date Hired: 2007

Name: Thomas W. Jenkins

Education:

MS - Electrical and Computer Engineering, NMSU, 1988
MS - Computer Science, NMSU, 1977
BBA - Business Systems Analysis, NMSU, 1974
BA - Spanish, NMSU spring 2004

Academic Experience:

2008 – present, Professor, Department of Engineering Technology and Surveying Engineering, New Mexico State University
1998 – 2007 Associate Professor, Department of Engineering Technology, New Mexico State University, coordinator of the electronics program, 1994-1998.
1990 – 1998 Assistant Professor, Department of Engineering Technology, New Mexico State University

Non-academic Experience:

1983-86, 1987-1990 Member of Technical Staff, TRW, White Sands Johnson Center, Las Cruces, NM
1986 Member of Technical Staff, Eagle Signal Controls, Austin, TX
1981-83 Head of Software Engineering, Computer Technology Associates, El Paso, TX
1979-81 Data Base Management Specialist / Senior Scientific Programmer, OAO Corporation / Kentron International, White Sands Missile Range, Las Cruces, NM
1976-78 Programmer Analyst, NMSU, Las Cruces, NM

Certifications / Professional Registrations:

Hewlett Packard RTE software school.
North Star application software school

Membership in Professional Organizations:

Institute of Electrical and Electronic Engineers
American Society for Engineering Education

Honors & Awards:

Tau Alpha Pi Professor of the Year 2002-2003; member Tau Alpha Pi National Honor Society; TRW Roll of Honor Award for Artificial Intelligence IR&D project; TRW/NASA Group and Individual Achievement Awards for support of the TDRSS launch, deployment, and on-orbit testing; TRW/NASA Certificate of Recognition; ARMTE letter of commendation for superior service to this agency.
New Mexico Alliance for Minority Participation mentor certificate of appreciation; Nominated and included in "Who's Who Among America's Teachers".

Service activities:

Member (and chair) of several departmental, college, and university, regional, national, and international committees.
Heavily involved in student advising along with Recruitment and Retention activities.
Grant and proposal efforts resulting in increased departmental and college resources.

Continuous and ongoing efforts to develop and improve effective labs and general curriculum. New Mexico Alliance for Minority Participation mentor.
Reviewed submitted papers for journals as well as various conferences.

Publications:

"Sustainable Energy Technology Curriculum Components: A Model Methodology for Engineering or Engineering Technology Programs*"* - **Sixth LACCEI International Latin American and Caribbean Conference for Engineering and Technology (LACCEI'2008)**

"Renewable Energy Technology: Engineering and Engineering Technology Educational Opportunities" - **Fifth LACCEI International Latin American and Caribbean Conference for Engineering and Technology (LACCEI'2007)**

"*WebCT in Assessment: Using On-Line e-Tools to Automate the Assessment Process*" – **Proceedings of the 2007 National ASEE Conference** – 2007

"Programming the 8254 PIT: A Tech-Tip Example and Boilerplate" -**The Technology Interface**, 2007

"Opportunities in Engineering and Engineering Technology Education: Renewable Energy Technologies", **2007 ASEE Rocky Mountain Section Conference**, 2007

"*The Use of a Project Oriented Capstone Course in an Assessment Process"* - **New Mexico Space Grant Consortium 8th Annual Science, Engineering, & Technology Education Conference** 2006

"Undergraduate Recruitment: A Model Strategic Plan for Undergraduate Recruitment of Students for Engineering Technology Departments" -**The Technology Interface**, 2006

"A Project-Oriented Capstone Course: The Design and Use in Assessment"- **Proceedings of the International Conference on Engineering Education**, 2006

"Programming the 8259 PIC: A Tech-Tip Example and Boilerplate" -**The Technology Interface**, 2006

Professional Development:

Attended "Teaching Seminars" over a variety of specific topics sponsored by NMSU Center for Educational Development. These are designed specifically for improving college-teaching skills. Attended a three credit graduate education course - "Designing Instruction for the College Classroom". Extensive use of professional organizations (IEEE, ASEE, etc.) and professional journals to maintain currency to areas related to teaching and professional expertise.

Attended several Internet and distance education related seminars, workshops, and conferences to improve my knowledge and skills related to this topic area and incorporate these into the classroom.

Obtained proficiency in second language – Spanish

Number of Years in Service to Department: 20 years **Date Hired:** 1990

Name: Jeffrey S. Beasley, Ph.D.

Education:

Ph.D. Electrical Engineering, 1995
MS Electrical Engineering, 1987
BA New Mexico State University, 1978
BS Engineering Technology, 1988

Academic Experience:

July 1, 2010 - present, Department Head, Engineering Technology and Surveying Engineering

1998– June, 2010 Professor, Department of Engineering Technology and Surveying Engineering, New Mexico State University

1992 – 1998 Associate Professor, Department of Engineering Technology, New Mexico State University, coordinator of the electronics program, 1994-1998.

1988 – 1992 Assistant Professor, Department of Engineering Technology, New Mexico State University

Non-academic Experience:

1984 - 1988 Engineer II, Agricultural Information Video Studio, Cooperative Extension Service. Duties included the supervision of the studio technical operation including video systems, studio upgrades and modifications, and satellite receiving system installation and daily operation.
Last position held: Engineer II - Full-time

1979 - 1984 Broadcast Engineer, KRWG-TV.
Duties included design, installation, and maintenance of all broadcast electronic equipment including Video and RF (UHF, VHF, and Satellite) systems. Last position held: TV Engineer III – Full Time

Certifications / Professional Registrations:

Registered Engineering Intern - State of New Mexico, Certificate # 3763
Federal Communications Commission General Radio-Telephone License, originally issued as a First Class Radio-Telephone License

Membership in Professional Organizations:

Institute of Electrical and Electronic Engineers
American Society for Engineering Education

Honors & Awards:

Tau Alpha Pi Professor of the Year 2006-2007
Outstanding Professor from the Society of Hispanic Professional Engineers, April, 1999
1998 Donald C Roush Award for Teaching Excellence, Jan. 1999.
Engineering Dean's Award of Excellence, December, 1998
1997-98 El Paso Energy Foundation Faculty Achievement Award in recognition of outstanding University Teaching, August 1998
Certificate of Recognition, National Aeronautics and Space Administration for a Class I NASA Tech Brief, 1992
Tau Alpha Pi National Honor Society

Service activities:

Editor and founder of the ***Technology Interface, a peer-reviewed on-line Journal. Founding*** editor 1996-1999, returned as editor in 2006 to 2010.

NMSU College of Engineering Tenure and Promotion Committee, 1998 – 2010

Development of an Information Assurance Center of Academic Excellence, joint with the NMSU Physical Science Laboratory, Business and Computer Information Systems, and the Computer Science Department. Submitted to the National Security Agency.

Publications:

Kelly, L., Morrell, M., Beasley, J., "Delivering Lab Based Courses Via Distance Education," 2006 Science, Engineering, and Technology Education Conference, Jan. 2006, **Note: Received the "Best Paper" award.**

CCNA 640-802 Network Simulator – Academic Edition, by Wendell Odom and Jeffrey S. Beasley, 2010

Network Simulator Mapping Guide: for Networking, **2nd** edition**,** Jeffrey S. Beasley, Prentice Hall, 2010

Networking, 2nd edition, Jeffrey S. Beasley, Prentice Hall, 2009

Modern Electronic Communication, Co-author with Gary Miller, Prentice-Hall, **9th** edition, 2008.

Lab Manual to accompany Modern Electronic Communication by Mark Oliver, Jeff Beasley, and David Shores, 9/e, 2008

Lab Manual with System Projects to accompany Modern Electronic Communication 3/e by Jeff Beasley and Michael Fairbanks, 2006.

Electronic Devices and Circuits, 6th. Edition, Bogart, Beasley, and Rico, Prentice Hall , 2004.

Professional Development:

Cisco Network Academy Instructor – requires continual professional development related to computer networking.

Participated in online workshops and training related to electronic communications.

Number of Years in Service to Department: 22 years

Date Hired: 1988

Name: Chris Wise

Education: MS, Industrial Engineering, 2004
BS, Mechanical Engineering Technology, 2010
BS, Electrical Engineering Technology, 1984

Academic Experience:

2001-present, Departmental Engineer, NMSU

- Taught freshman level classes such as 3-D modeling using Solid Works and Introduction to Engineering Materials w/ intro to COSMOS (FEA) (6 years)
- Teach Applied Strengths of Materials lab (use of compression/tension, torsion and rockwell hardness equipment, since spring 2007)
- Teach course on the History of Manufacturing and Technology
- Taught manufacturing processes lab, introduces students the use of manual and CNC mills and lathes (2 years)
- Taught senior level machine design lab (1 year)
- Mentor students (graduate and undergraduate) on special project
- Mentor students for the Alliance for Minority Participation (AMP) and Summer Community College Opportunity for Research Experience (SCCORE)

Non-academic Experience:

2001-present, Departmental Engineer, NMSU

- Project Manager for Solar Furnace refurbishment/operation
- Serve as academic advisor for the Society of Automotive Engineers, Mini-Baja Team
- Served as Technical liaison for Rural Renewable Energy Alliance
- Developed and operate system utilizing Solidworks/CamWorks (CAD/CAM) to fabricate printed circuit boards (thru hole and surface mount) using a table top CNC mill
- Design and fabricate new applications/upgrades for Civil, Electrical and Mechanical Labs
- Responsible for the operation and maintenance for the materials testing equipment for torsion, tension and compression experiment

4-99 to 10-01, QA Manager, CALCULEX, INC

Calculex designs electronics and software for high-rate digital instrumentation data recorders for military aircraft.

- Developed and implemented quality assurance programs and inspection plans per Mil-I-45208
- Performed static structural analysis on mechanical enclosures
- Designed production tooling fixtures and QA go/no-go gauges
- Conducted readiness reviews for new designs and prototypes as they related to mechanical hardware
- Assisted in development of cost justification for outsourcing of flight hardware
- Performed audits of potential sub-contractors as well source inspections

6-98 to 4-99, Senior Quality/ Test Engineer SMART CORPORATION

SMART Corporation designs and develops Home Automation and Energy Management Systems for both residential and commercial applications. These systems use a language known as CEBus that communicates over the power line using a spread spectrum signal format.

- Developed Acceptance Test Procedures (ATP) for Software Programs based on the Windows 98 platform
- Performed first article functionality tests on hardware prior to production runs
- Responsible for outsourcing of new product lines
- Participated in product readiness reviews and concept realization reviews
- Developed Acceptance Test Procedures for testing and verification of firmware specific applications and their compatibility with other manufacturer's product

12-93 to 6-98, QA Manager, PHYSICAL SCIENCE LABORATORY

The Physical Science Laboratory (NMSU) Electronic Systems Branch primarily designs and manufactures command and telemetry systems for various launch vehicles for NASA and other various customers.

- Managed QA programs for NASA, inclusive of both electrical and mechanical fabrication of flight boxes
- Developed, implemented and monitored quality assurance programs and inspection plans Responsible for NASA hand soldering school Responsible for Configuration Control of drawings and procedures
- Chaired Material Review Board (MRB) and Corrective Action Board (CAB)
- Participated in source surveillance activities for critical suppliers
- Established and conducted a Total Quality Management (TQM) Training Program for 75 employees

Membership in Professional Organizations:

American Society of Mechanical Engineers
Society of Automotive Engineers

Honors and Awards:

Tau Alpha Pi National Honor Society

PUBLICATIONS:

- Wise, Chris, "Fabrication of Printed Circuit Boards Using a Table Top CNC Mill", Fall 2007, The Technology Interface
- Chavez, A., Kelly, L., Ricketts, P., and Wise, C., "A Discrete-Event Simulation Model For Optimizing Operations, Equipment, And Resources for a Geo-Technical Testing Facility", 85-92, Business and Industry Symposium, 2003 Advanced Simulation Technologies Conference, The Society for Modeling and Simulation International, March 30-April, 2003, Orlando Florida.

Professional Development:

Awarded Bachelors of Engineering, Mechanical Engineering Technology, August 2010

Name: Wesley T. Eaton

Education: New Mexico State University
B.S. Mechanical Engineering Technology, December 2001
Minor: Manufacturing Engineering, December 2001

Clarendon College, Clarendon Texas
Associates in Applied Science, May 1998

Present Position:

Project Manager/ Engineer: MTEC (Manufacturing Technology and Engineering Center) at New Mexico State University. July 2005 to Present
Project Management responsibilities include:

- Supervised, facilitated and coordinated all activities of Industrial related (non-academic) projects that M-TEC is involved with.
- Act as the primary point of contact with customers and industry representatives.
- Responsible for the timely delivery of manufacturing solutions to companies throughout New Mexico.
- Responsible for cost estimates, project timelines, scheduling, delegation of project needs to M-TEC staff (including students) and shop facilities.
- Support projects through all stages: Design, Prototype and Manufacturing.
- Engineering Mechanical and Agriculture systems for research and industry projects.

Previous Position:

Engineer I: MTEC (Manufacturing Technology and Engineering Center) at New Mexico State University. December 2001 to June 2005

Design Engineering responsibilities include:

- Design, Analysis and Prototyping of mechanical, manufacturing and farm related apparatus, machinery and components.
- Generate cad drawing using solid modeling software along with testing, evaluation and material requirements.
- Provide production drawings and presentation of designs as needed.

Work Experience:

- Strong mechanical aptitude and problem solving ability.
- Strong technical background in metal working areas including machining, welding etc.
- Ability to take an idea and develop it into a usable product.
- Excellent solid modeling ability using Solid Works.
- Strong ability and knowledge in TIG, MIG and Arc welding, including use of jigs and fixtures.
- Team player works well in-groups.

- Excellent written and oral communication skills.
- Very effective interfacing with customers and their needs.
- Management and supervision ability of both shop facility and personnel

Teaching Experience:

Product design and Development –NMSU Fall 2003-2004
Advanced CAD modeling with Solidworks Spring 2009-2011

Research/ Industry Projects:

Chile Research Projects:

1. Row Crop thinning Machine: One of the team members that designed and commercialized a mechanical row crop thinning machine that uses sensors combined with a mechanical cutting apparatus.
2. Chile Cleaning Equipment: Design and Evaluate numerous methods and designs for the cleaning of debris from mechanically harvested red chile.
3. Chile Destemming Machine: Responsible for the mechanical design and construction of main drive system and chile feeding section of the machine that images and cuts the stem off a chile pod.

Other Designed Research/ Industry Projects:

1. Investment Casting Oven used in jewelry industry.
2. Medical lifting device used in hospitals for lifting a patient.
3. Onion bagging and boxing equipment used in packaging plants to weight product and fill a bag or box.
4. Body identification and tagging system used to identify bodies in a mass casualty situation.
5. Rangeland spraying equipment used to spray invasive brush species with the use of less chemical and better effectiveness.
6. Precision fertilization equipment for row crops uses nitrogen sensors and control system to vary output rates on demand.
7. Gooseneck hitch redesign for manufacturability to be used in vehicles towing gooseneck trailers for a smoother ride.
8. Methane digester container construction for storage and collection of methane from dairy manure.
9. Herbicide applicator for applying herbicide on salt cedar without any chemical damage to ground or the grass species.
10. Ozone generator system implemented into a Clean in Place system for dairy industry.

Patent:

Crop Thinning apparatus and method
United States Patent 7,032,369
Eaton , et al. April 25, 2006

Award:

New Mexico Chile Task Force Outstanding Contribution Award 2003

Name: Eduardo Marcos Gamillo

Education:

MS in Industrial Engineering, New Mexico State University, Las Cruces NM, May 2010

BS in Mechanical Engineering Technology, New Mexico State University, Las Cruces NM, December 2005

Academic Experience:

M-TEC NMSU Manufacturing Technology and Engineering Center, Engineer I, Las Cruces NM, February 2007 to Present.

- Responsible for engineering design, fabrication, and development of agricultural machinery to enhance economic development in the State of New Mexico.
- Extensive use of SolidWorks through different projects and design applications.
- Interacted with different computer aided software such as CAMWorks and FeatureCAM to go from concept to prototype to a full project development.
- Extensive use of computer numerical control machines, (Vertical Machining Centers).

College Instructor, New Mexico State University, Las Cruces NM, August 2008 to present

- Responsible for teaching beginning and advance computer aid design courses.

Physical Science Laboratories, NMSU, Lead Field Service Representative, Ar Ramadi Iraq, January 2006 to January 2007.

Worked in support of operation Iraqi freedom providing Electronic Counter Measure knowledge (ECM) used to neutralize the threat of Radio Controlled Improvise Explosive Devices.

- Responsible for the installation, troubleshooting, upgrade, waveform upload, as well as quality control of all Electronic Counter Measures (ECM) systems
- Instruct US Marines, US Army Soldiers and US Navy Personnel in the proper use and maintenance of all ECM systems
- Advice Electronic Warfare Officers on the proper implementation of all ECM systems within a convoy
- Proficient use of Spectrum Analyzers, Signal Generators, oscilloscopes and Multi-meters

M-TEC NMSU Manufacturing Technology and Engineering Center, Undergraduate Research Assistantship, Las Cruces NM, May 2005 to Dec 2005.

- Assessment of an adobe making machine
- Designed and manufactured all the guards that the machine required to meet OSHA standards
- Provided advice and consultation on the use of equipment
- Worked as a liaison between company, university, and M-TEC

Non-academic Experience:

US Army Reserves, Specialist E-4, Motor Vehicle Operator, 281st Transportation Company, Las Cruces NM, May 2001 to Present.

- Served 10 months active duty in Iraq
- Completed over 150 missions - force protection for convoys.
- Responsible for equipment operation, training and directing both civilian and military operations

Doña Ana Branch Community College, Tutor, Las Cruces, NM, August 2002 to February 2003.

- Provided tutoring for all mathematical courses offered at DABCC
- Tutored other subjects such as chemistry, computer skills and electronics
- 100% Bilingual, tutored in English and Spanish
- Tutored on an individual basis and in classroom

Certifications:

Certified SolidWorks Associate

- Certificate ID**: C-98N2ZSQ28Y**
- **Cerified Project-Lead-the-Way instructor- Principles of Engineering**

Honors and Awards:

Honors Graduate. Graduated with the highest GPA of grad school, maintaining a 4.0 throughout my masters degree.

Appendix C – Equipment

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

Materials Testing Lab

Instron Universal Testing Machine - 50 kN
2- Soil Test Compression Machine – 60 kip
Tinius-Olsen Torsion Machine
Moore Rotating Fatigue Machine
Dynamic Penetrometer
Column Bucking Demo Apparatus
"Advanced Structures Set" including
-Truss members and connections
-slotted mass set
-load cell and amplifier
Beam Deflection Demo Apparatus
3 sets of Vishnay Cantilever Loading Frames with Analog Strain Indicators
Assorted Micrometers and Calipers
~ 30 - 4" x 6" Disposable Concrete Cylinder Molds
Rockwell Hardness Testing Machine
Shore Scleroscope

Material Strengths Lab

2- Tinius Olsen Universal Testing Machine – 60 kip
Tinius Olsen Universal Testing Machine – 120 kip with computer interface
Tinius Olsen Universal Testing Machine – 400 Kip
50 ft Composite (Concrete/Steel) Bridge Test Section w/ 100 k Loading Jack
Interchangeable fittings for Compression, Tension, and Modulus of Rupture Tests
Omega 10 kip Load Cell w/ Data Logger
Charpy Impact Machine
2 – 4000 g scale
1 – 60 lb scale
Assorted Extensometers
3 – Vishay Digital Strain Indicators
Concrete Consolidator
Dynamic Modulus Apparatus
2 – Drying Ovens
ASTM C-231 Type B Concrete Air Content Meter
ASTM C-173 Roller Air Meter
6 - Vishay Model P3 Strain Indicators

4 Slump Cones
Assorted Rods and Trowels
~ 20 each of 6x12, 4x8, and beam Re-usable Concrete Molds
Mortar Cube Molds

Fluid Technology Lab

Equipment: Flow Benches (2), Flow Meter Testing Apparatus, Vega Hydraulic Oil Bench, Pelton Wheel, Pressure Gage Calibration Device, Pipe Friction Testing Apparatus (2), Jet Impact Tester, Floating Vessel Stability Testing Apparatus, Open Channel Flow Apparatus, Self-Actuating, Hinged Gate Apparatus, *Ashcroft* Dead-Weight Testers (2), Pressure Volume Controllers (3), Inclined Reservoir Manometers (10), Variable-Reluctance Pressure Transducers (10), Carrier Demodulators for Variable-Reluctance Pressure Transducers (10), Bench-Top Windtunnel Apparatus, Table-Top Windtunnel, PC-based Data Acquisition System, digital analytical balances (2), triple-beam analytical balances (6), *Brookfield* Digital Viscometer, and misc. glassware.

Seven Table-Top Demonstration Devices (*borrowed from CAGE Dept.*): *Falling Ball Viscometer*, *Vessels Illustrating Pascal's Paradox*, *Set of Three Manometer Designs*, *Tanks with Falling Heads*, *Failure Modes of Dam under Hydrostatic Pressure*, *Hydraulic Jump Apparatus*, and *Two-Dimensional Trajectories of Liquid Efflux Streams*.

Ethics Videos (2): *Laboratory Efficiency* and *The Truesteel Affair*.

Field Trip Destinations: *Research Water Channel* in Aerolab of ME Dept. (on NMSU main Campus); Cheese Making Facility of *F&A Dairy* (in local industrial park).

Thermodynamics / Heat Transfer Lab / HVAC Lab

Equipment: Double Pipe Heat Exchanger, Air Flow Apparatus, Evaporative Cooling Test Apparatus, Finned-Tube Heat Exchanger Apparatus, Mixing Valve Apparatus with PID Controller, Engine & Dynamometer (single cylinder), Engine & Dynamometer (multi-cylinder), Vacuum Pump, Vacuum Chamber, Air Flow Meter (2), Digital Multimeters (6), Digital Oscilloscopes (3), Bench-Scale Vapor-Compression Refrigeration System, Handheld Electronic T/C Thermometers (3), Handheld Electronic Thermistor Thermometers (3), PC-based Data Acquisition System, Hot Plates (6), Hot Plate/Magnetic Stirrers (2), Magnetic Stirrers (2), Mercury Barometer, Watt Meter, Brake Fluid Boiling-Point Testers, (2) and Alcohol-in-Glass Thermometers (6).

Thermodynamics Lab (only)

Ethics Videos (2): *The Truesteel Affair* and *The Case of the Challenger Disaster*.

Field Trip Destination: *Cogeneration Plant* (on NMSU main Campus).

AutoCAD Labs

Our students have access to six labs that have current versions of AutoCAD and land development software. Two of these labs are located in the Doña Ana Community College Technical Studies building. This facility is within walking distance from the main campus.

Manufacturing Lab (EC1, Room 152)

Lathes (11)	Mills (8)	Saws (3)
CNC Machines (4)	Welders (3)	Drill Presses (8)
Grinders (8)	Belt Sanders (2)	Shears (2)
Brakes (3)	Rolling Machines (3)	Rapid Prototyping
Surface Grinder	Casting Kiln (3)	Cutting Torch
Spot Welder	Die Sink EDM	Glass Beader
Hydraulic Press (2)	Iron Worker	Thermal Forming

Student Project Center (EC II, Room 131)

Lathes (2)	Mills (2)	Drilling Presses (2)
Saws (3)	Welders (3)	Belt Sander
Ironworker	Grinders (2)	CNC Mill
Plasma Torch	Oxygen/Acetylene Torch	

Quality Assurance Lab (EC 3, Room 160)
Coordinate Measuring Machines (3)
Optical Comparators (4)
Isolation Table
Hardness Testers (2)
Surface Finish Tester

Kinematics and Machine Analysis Labs (EC3, Rooms 137 & 246)
GM Cam Shaft (for determining cam lift data)
Balmac Vibration Meter, Model 200
SPM Vibrameter, Model VIB-10
Quest Technologies Vibration Meter, Model VI-100
Assorted strain gages for various strain gage labs
Budd Strain Indicator
Vishey Strain Indicators (4)

Torque Strain Measuring Apparatus, Cam Testing Apparatus, Assorted Mechanisms, Load Cell (1000lb), Load Cell (5000 lb), Crank-Slider Testing Apparatus, Hydraulic Jack Testing Apparatus

Software Usage:

Design of Machinery (DOM) by Robert Norton (supplement to text, for ET 328)

MDESIGN by Robert Mott (supplement to text, for ET 426)

Excel

Computer Integrated Manufacturing Lab (EC3)

CNC Lathe
CNC Milling Machine
Coordinate Measuring Machine (CMM)
Rapid Prototyping Machine

Software Usage:

SolidWorks
CNC Programming
MS Project
Excel
Primavera

Appendix D – Institutional Summary

Programs are requested to provide the following information.

1. **The Institution**

a. New Mexico State University
Las Cruces, NM 88003-8001
USA
505-646-0111
www.nmsu.edu

b. Dr. Barbara Couture, President.

c. This self-study report was prepared and submitted by Dr. Jeff Beasley, head, Engineering Technology and Surveying Engineering department.

d. NMSU has been accredited by the Commission on Higher Education of the North Central Association (NCA) of Colleges and Schools since 1926, except for a brief period in 1940-1941. Since 1963, the institution has held preliminary to full accreditation status at the doctoral level. At our last general visit, New Mexico State University was once again reaccredited for the maximum period possible (10 years). At that time, the institution was commended for the contributions made by faculty and staff to teaching, research, and service; effective administration; and the significant increase in the quality and quantity of research during the past decade.

The College of Engineering is accredited by:

Accreditation Board for Engineering and Technology- Technology Accreditation Commission (date of first accreditation: 1968)
Accreditation Board of Engineering and Technology- Engineering Accreditation Commission (date of first accreditation: 1938)

2. **Type of Control**

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

New Mexico is a comprehensive state-funded land-grant institution of higher learning, Overall responsibility for the university resides in an autonomous Board of Regents appointed by the governor of the state and confirmed by the state Senate. The board delegates authority for the internal management of the institution to the president. The faculty elects a Faculty Senate, which has legislative jurisdiction over policies affecting the academic mission of the university.

New Mexico State University is dedicated to teaching, research, and service at the undergraduate and graduate levels. NMSU is a NASA Space Grant College, a Hispanic-serving institution and is home to the only Honors College in New Mexico. NMSU provides learning opportunities to a diverse population of students and community members at five campuses, a satellite learning center in Albuquerque, cooperative extension offices located in each of New Mexico's 33 counties, 13 research and science centers and through distance education

3. Educational Unit

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

Civil Engineering Technology is one of six programs located within the Department of Engineering Technology and Surveying Engineering. Engineering Technology and Surveying Engineering is one of seven academic departments within the College of Engineering. Engineering, in turn, is one of seven undergraduate academic colleges within New Mexico State University. The organization of the entire institution is shown in Figure 1. Details within the College of Engineering are shown in Figure 2, and details of the Department of Engineering Technology are shown in Figure 3.

In July of 2010, Dr. Jeff Beasley took over as department head from Dr. Sonya Cooper who returned to the Civil Engineering Technology faculty.

<u>Department Organization</u>

Head ……... Jeff Beasley
Associate Head …… Lynn Kelly
Coordinator, Civil Technology ……... Kenny Stevens
Coordinator, Electronics and Computer Technology..... ….. Lynn Kelly
Coordinator, Information Engineering Technology …… Michael Morrell
Coordinator, Mechanical Technology ……. Craig Ricketts
Coordinator, Information and
Communications Technology …….. Michael Morrell
Director, Security Technology Program……. Michael Morrell
Director, Manufacturing Technology Center …….. Anthony Hyde

The department offers both associate and baccalaureate degrees in Civil, Mechanical, and Electronics & Computer Engineering Technology and Information Engineering Technology. In addition, a distance education baccalaureate degree in Information and Communication Technology started in the fall of 2004. Of these programs, only the bachelor's in Civil, Mechanical, Electronics & Computer and Information Engineering Technology are being reviewed for accreditation.

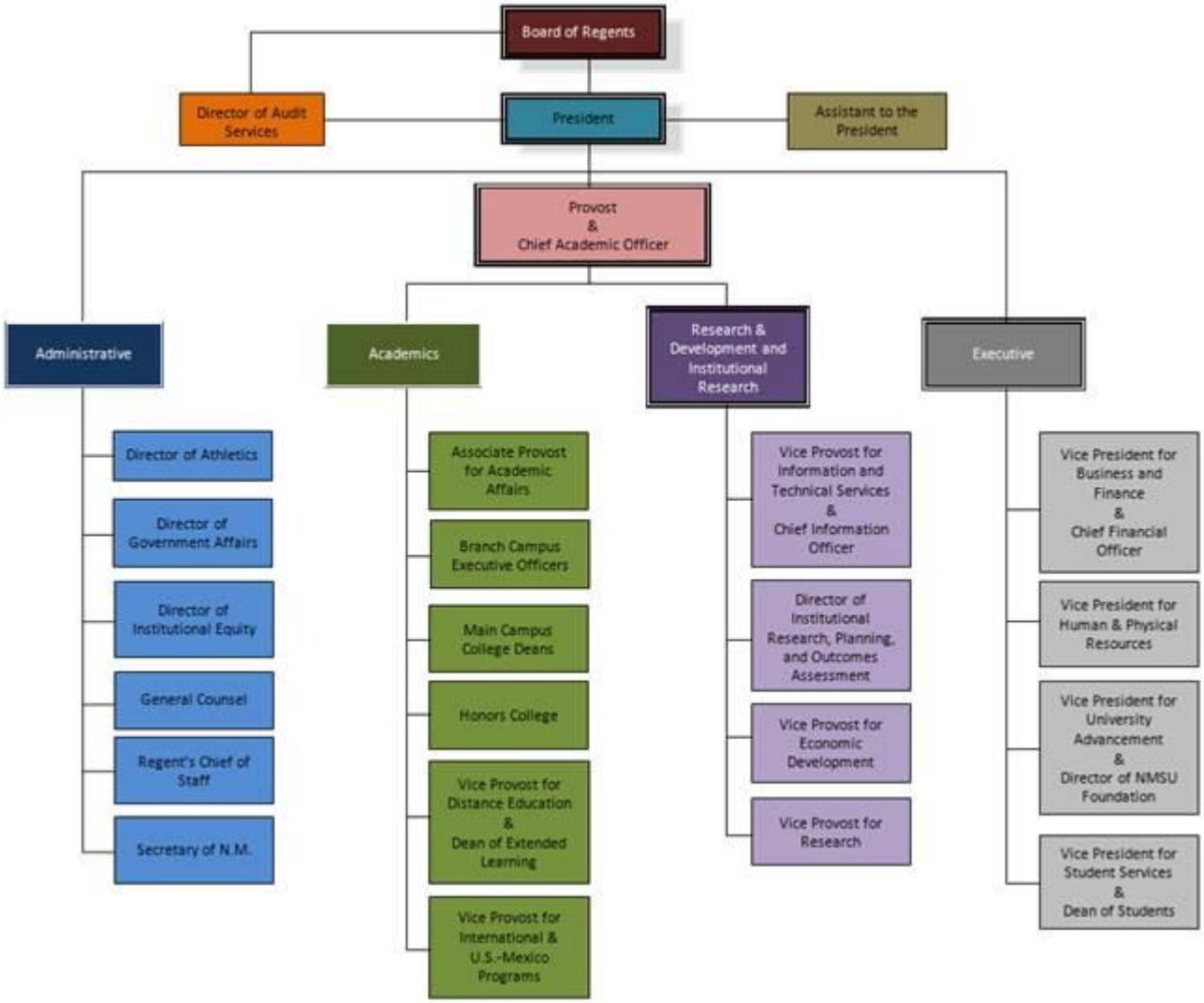

Figure 1. Organizational Chart (University)

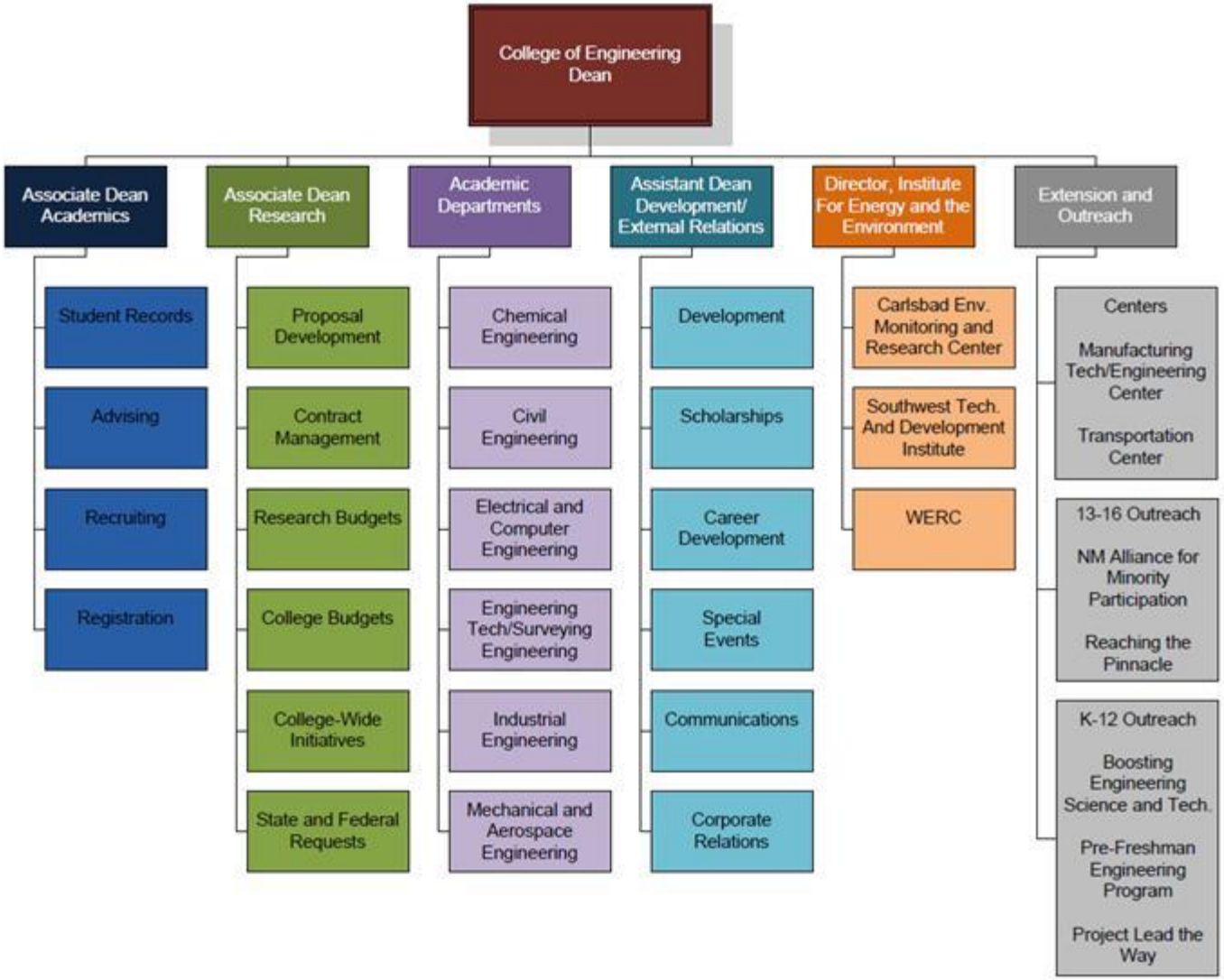

Figure 2. Organizational Chart (College)

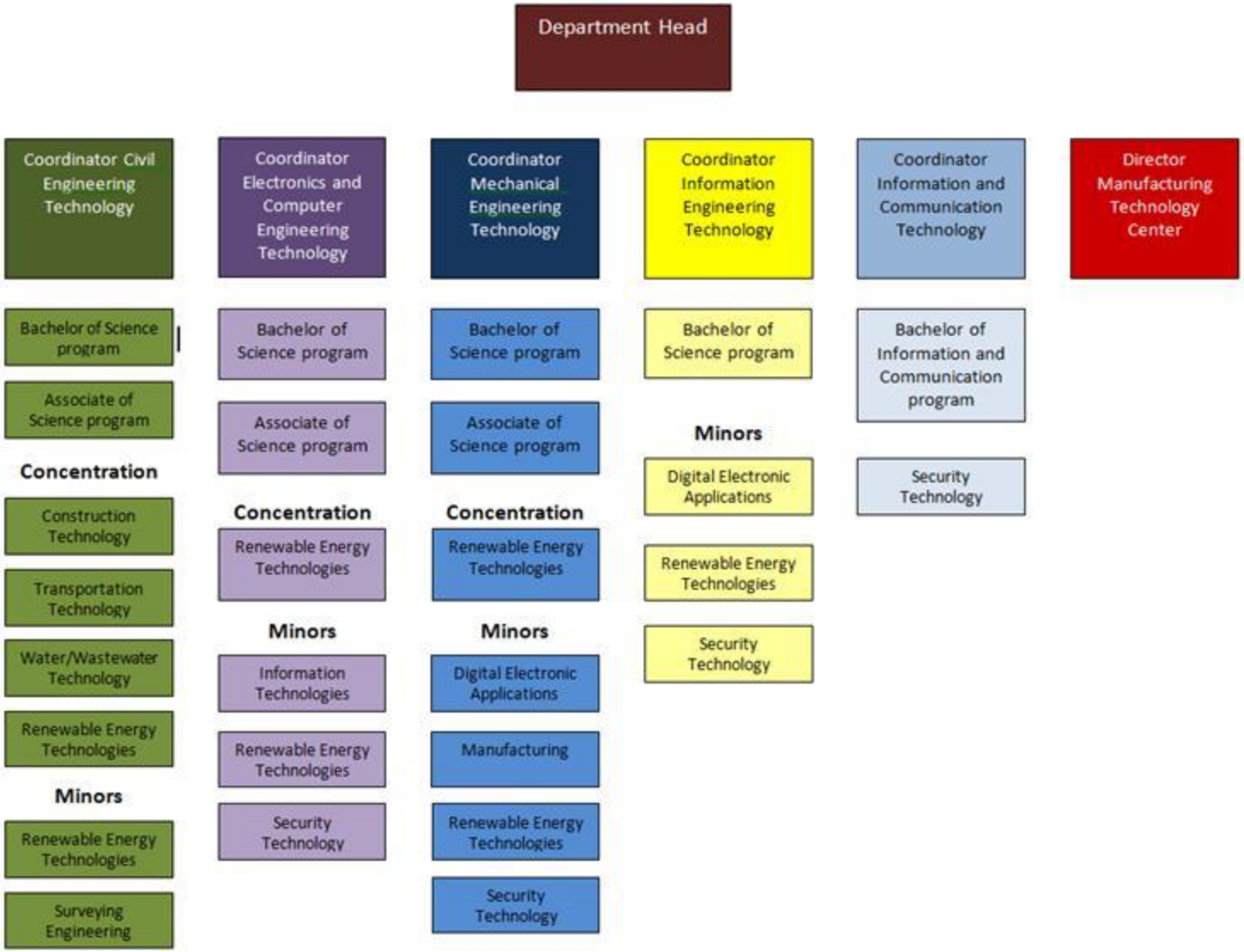

Figure 3. Organization Chart (Department)

4. Academic Support Units

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

Department of Mathematics
Dr. Joseph Lakey, Academic Department Head
Email: jlakey@nmsu.edu
Phone: (575) 646-3901

Department of Physics
Dr. Stefan Zollner, Academic Department Head
Email: zollner@nmsu.edu
Phone: (575) 646-3831

Department of Chemistry and Biochemistry
Dr. Michael Johnson, Academic Department Head
Email: jjohnson@nmsu.edu
Phone: (575) 646-3627

5. Non-academic Support Units

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

NMSU Library
Dr. Elizabeth A. Titus, Dean
Email: etitus@nmsu.edu
Phone: (575) 646-1508

Information and Communication Technology
Dr. Shaun H. Cooper, Associate Vice-President , Information Technologies
Email: socooper@nmsu.edu
Phone: (575) 646-6030

Career Services
Steven Salway, Director
Email: ssalway@nmsu.edu
Phone: (575) 646-1631

Math Success Center
Dr. Larry Hughes, Director
Email: lhughes@nmsu.edu
Phone: (575) 646-2145

Reaching the Pinnacle (RTP)
Randy Larry, Director
Email: rlarry@nmsu.edu
Phone: 575 646-2994

RTP is a National Science Foundation (NSF) funded program whose major objective is to promote Science, Technology, Engineering and Mathematics (STEM) for persons with disabilities. In order to accomplish this, RTP has established a number of avenues through which funding may be used to directly impact students' and educators' STEM pursuits.

The flagship activity under RTP is the Mentor Program. Mentors in this program are college students with identified disabilities majoring in STEM. The role of a mentor is to participate in projects set up by RTP at schools, assist with research projects, provide academic support/tutoring in schools, engage in other activities that RTP designates, or implement individual STEM education projects.

RTP also sponsors RTP Summer Science Institutes which are designed to pique students' interests in STEM before they enter college. RTP has educational and professional Partners throughout its entire region (all of New Mexico and most of West Texas). Partner projects are funded through RTP and provide support for Partners to participate in STEM activities designed to meet their needs.

Improving the quality of life for students with disabilities is not just a slogan; it's a mission for RTP and its partners. RTP is striving to increase the number of persons with disabilitiies in the STEM work force. RTP is providing the means, support and encouragement for students with disabilities to overcome the educational barriers they face in considering STEM careers.

Security Technology Center
Program Director: Prof. Michael Morrell
Location: Engineering Complex III, Room 389

First proposed by Sandia National Laboratories and funded by the Federal Bureau of Investigation, the Security Technology Center provides a unique, multidisciplinary, pro-active role in teaching security technology concepts at the University level. The center provides multimedia training for students and curriculum development support for security technology in the classroom.

Manufacturing Technology and Engineering Center (M-TEC)
Program Director: Mr. Anthony Hyde
Location: Engineering Complex III, Room 269

The Manufacturing Technology and Engineering Center (M-TEC) was initiated in August of 2000. M-TEC's mission is to support economic development in New Mexico by providing quality manufacturing education, technical assistance and other extension services to industries in New Mexico with an overall goal of improving the standard of living of citizens of New Mexico. M-TEC maintains five fully functional, professionally staffed manufacturing facilities. Among the capabilities provided by M-TEC are:

- Product design and development,
- Manufacturing processing and engineering,
- Prototyping,
- Manufacturing training, and
- Other services such as machining and metal fabrication.

These services are available to support academic, research, and service activities within the Department of Engineering Technology.

New Mexico Alliance for Minority Participation (NM-AMP)
Program Director: Dr. Ricardo Jacquez
Location: Engineering Complex I, Room 106

New Mexico AMP is dedicated to increasing the number of minority students pursuing degrees in science, technology engineering, and math (STEM). New Mexico AMP supports minority students with undergraduate research assistantships, opportunities to participate in research activities under the mentorship of faculty, and opportunities to present technical papers. New Mexico AMP is an Alliance of the 2 and 4-year institutions of higher education in New Mexico. The Associate Dean of Engineering works with New Mexico AMP to forge articulation agreements among the alliance members. New Mexico AMP also brings distinguished lecturers and role models in contact with minority students.

New Mexico AMP, through a generous grant from the Hewlett Foundation, has been instrumental in developing Integrated Learning Communities (ILCs) to address the low graduation rate among inadequately prepared students. Experience shows that incoming freshmen who do not qualify for MATH 185 (college algebra) are only one-third as likely to graduate as those who test into at least MATH 185. The ILCs are combating this problem by:

- Providing supplemental instruction and study help in math,
- Introducing basic engineering concepts during the first year, and
- Fostering a community spirit within the cluster groups.

A limited number of incoming engineering freshmen are selected to participate in the ILC program. Enrollment is restricted to students who test into MATH 115, the precursor to MATH 185. Currently, the number of seats available to ILC students is resource bound to two clusters of 25 students each. ILC participation is voluntary and on a first-come-first-served basis.

Students participating in an ILC all enroll in the same full-time block of classes and attend these classes as a cluster:

- EE 109 (The Engineering of How Things Work)
- ENGL 111G (Freshmen Composition)
- MATH 115 (Intermediate Algebra)
- MATH 101 (Supplemental Instruction)
- SMET 101 (Introduction to Science, Mathematics, Engineering, and Technology)

Whenever possible, projects and assignments in the various classes are related. For instance, while discussing stress and loading in EE 109, bridges may serve as an example. Then the SMET 101 instructor may assign a project to design and test balsa wood bridges. During the project will have to conduct research and make oral presentations on various aspects of bridge design. The math required to analyze the bridge designs would be provided in MATH 115, using bridge examples. The students may also write essays and reflections on the research topic for ENGL 111G. During the final exam period of SMET 101 the students would make an oral presentation of their bridge design to all cluster instructors. Since the students attend the classes as a cluster, a collective attitude develops while they use teamwork to complete their assignments.

6. Credit Unit

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

7. Tables

Complete the following tables for the program undergoing evaluation.

Table D-1. Program Enrollment and Degree Data

Table D-1. Program Enrollment and Degree Data

Mechanical Engineering Technology

Academic Year	Enrollment						Degrees Awarded		
	Status	1st Year Freshman	2nd Year Sophomore	3rd Year Junior	4th Year Senior	Total	Associates	Bachelors	Total
2010-2011	FT	25	23	14	37	99	0	17	0
	PT	3	2	2	4	11			
2009-2010	FT	30	16	19	30	95	0	17	17
	PT	2	0	1	5	8			
2008-2009	FT	16	13	17	37	83	1	19	20
	PT	0	4	0	6	10			
2007-2008	FT	13	15	20	31	79	0	13	13
	PT	0	1	2	7	10			
2006-2007	FT	14	18	23	21	76	0	12	12
	PT	0	2	1	7	10			
2005-2006	FT	14	25	11	35	85	0	22	22
	PT	0	1	1	8	10			

FT--full time
PT--part time

Table D-2. Personnel

Bachelor of Science in Engineering Technology
Mechanical Engineering Technology

Year[1]: __2011__

	HEAD COUNT		FTE[2]
	FT	PT	
Administrative[3]	1		1/6
Faculty (tenure-track)	3		3
Other Faculty (excluding student Assistants)	5		2/3
Student Teaching Assistants	0		0
Student Research Assistants	0		0
Technicians/Specialists	2		¼
Office/Clerical Employees	1		0
Others[4]	0		0

Report data for the program being evaluated.

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

[2] For student teaching assistants, 1 FTE equals 20 hours per week of work (or service). For undergraduate and graduate students, 1 FTE equals 15 semester credit-hours (or 24 quarter credit-hours) per term of institutional course work, meaning all courses — science, humanities and social sciences, etc. For faculty members, 1 FTE equals what your institution defines as a full-time load.

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

[4] Specify any other category considered appropriate, or leave blank.

Signature Attesting to Compliance

By signing below, I attest to the following:

That _____ (*Name of the program(s)*) has conducted an honest assessment of compliance and has provided a complete and accurate disclosure of timely information regarding compliance with ABET's *Criteria for Accrediting Technology Programs* to include the General Criteria and any applicable Program Criteria, and the ABET *Accreditation Policy and Procedure Manual.*

_____

Dean's Name (As indicated on the RFE)

_____ _____

Signature **Date**