Revised Assessment Plan Mechanical Engineering Technology Program College of Engineering Architecture and Technology Oklahoma State University Fall 2001

## 1. Name of Academic Program

Mechanical Engineering Technology Department

### 2. Degree programs that are assessed under this plan

B. S. in Engineering Technology Mechanical Engineering Technology Option Oklahoma State University Major 4331

# **3.** Mission, objectives or goals of the Mechanical Engineering Technology program:

The Department of Mechanical Engineering Technology (MET) has goals that are in line with the three mission charges of the Oklahoma State University–instruction, research, and extension services. The goals of MET for each of these missions are described below.

#### **Goals for instruction**

- Goal 1: Offer a quality program that is eligible for ABET (TAC) accreditation.
- Goal 2: Actively recruit outstanding faculty members and provide excellent supports for continuous improvements of their teaching effectiveness.
- Goal 3: Actively recruit outstanding students and educate them to be highly qualified engineers and technologists.

#### **Goals for research**

- Goal 1: Encourage and support faculty to develop funded research programs and to become recognized experts at the national and international level.
- Goal 2: Develop and strengthen collaborative relationships between MET and the industry for research and development.
- Goal 3: Contribute to the economical growth of the state, nation, and world through applied research in selected areas.

#### Goals for extension and public services

- Goal 1: Develop and continue training seminars for engineers in industry in selected areas.
- Goal 2: Provide educational opportunities to employees in engineering and manufacturing companies.

#### **OBJECTIVES**

In order to achieve these goals, we will accomplish the following specific objectives:

#### **Objectives for instruction**

Goal 1: Offer a quality program that is eligible for ABET accreditation. Objectives related to this goal are:

- 1. Review each year the following elements for every course: syllabus, use of computer language, use of library, lab activities, design project requirements, written reports, and oral presentations.
- 2. Compare the review results with the ABET accreditation criteria.
- 3. Make adjustments to each course that does not meet the criteria for accreditation.

Goal 2: Actively recruit outstanding faculty members and provide excellent supports for continuous improvements of their teaching effectiveness.

Objectives related to this goal are:

- 1. Increase the number of tenure-track faculty members by one in the next two years.
- 2. Encourage sabbatical leaves, and make it possible for eligible faculty members to be on leave.
- 3. Hire temporary teaching faculty and invite visiting faculty of high quality to provide support for regular faculty.
- 4. Encourage faculty members to attend education-related professional conferences of national or international level, and provide travel funding if needed.

Goal 3: Actively recruit outstanding students and educate them to be highly qualified engineers and technologists.

Objectives related to this goal are:

- 1. Publicize the Fluid Power Educational Foundation (FPEF) scholarship available for high school seniors who have committed to attend the MET program and pursue fluid power education.
- 2. Publicize scholarships available for MET students. The Society of Manufacturing Engineers (SME) and FPEF provide continuous scholarships specifically for MET students.
- 3. Actively contact and visit high schools and engineering/manufacturing companies to recruit new students.
- 4. Be proactive in recruiting international students.

#### **Objectives for research**

Goal 1: Encourage and support faculty to develop funded research programs and to become recognized experts of national and international level.

Objectives related to this goal are:

- 1. Encourage and help faculty members to find funding opportunities.
- 2. Encourage every faculty member to publish peer-reviewed papers in technical or educational journals.
- 3. Encourage every faculty member to present papers in technical or educational conferences, and provide funding for travel if needed.

Goal 2: Develop and strengthen collaborative relationships between MET and the industry for research and development.

Objectives related to this goal are:

- 1. Increase awareness of the willingness and capabilities of the faculty to collaborate the industry.
- 2. Encourage faculty to contact and visit engineering/manufacturing companies for possible mutual supports.

Goal 3: Contribute to the economical growth of the state, nation, and world through applied research in selected areas.

Objectives related to this goal are:

1. Help faculty recognize the need and direction of the state and nation for applied research.

#### **Objectives for extension and public services**

Goal 1: Develop and continue training seminars for engineers in industry in selected areas. Objectives related to this goal are:

- 1. Conduct Ground Source Heat Pump Seminars at least twice a year.
- 2. Publicize applications of ground source heat pump technology.
- 3. Encourage companies and individuals to install ground source heat pump technology for heating and cooling, and provide technical support.

Goal 2: Provide educational opportunities to employees in engineering/manufacturing companies.

Objectives related to this goal are:

- 1. Publicize educational opportunities to employees in engineering/manufacturing firms.
- 2. Offer televised courses for students in other locations.

# 4. Expected student outcomes of the Mechanical Engineering Technology program (ABET 2000)

The expected outcomes for graduates (as defined by TAC of ABET) of the Mechanical Engineering Technology department are graduates who:

- demonstrate an appropriate mastery of the knowledge, techniques, skills, and modern tools of their disciplines,
- apply current knowledge and adapt to emerging applications of mathematics, science, engineering, and technology
- conduct, analyze and interpret experiments and apply experimental results to improve processes,
- apply creativity in the design of systems, components, or processes appropriate to program objectives,
- function effectively on teams,
- identify, analyze, and solve technical problems,
- communicate effectively,
- recognize the need for and possess the ability to pursue lifelong learning,
- understand professional, ethical, and social responsibilities,
- recognize contemporary professional, societal, and global issues and are aware of and respect diversity, and
- have a commitment to quality, timeliness and continuous improvement.

These expected outcomes must be addressed during the next accreditation cycle in 2005. The present evaluation methods detailed in Section 5 of this report will form the basis for our response to ABET for the year 2005 report. The faculty believes that our evaluation methods are good to this time, but will need to be continually reviewed in advance of our next accreditation cycle.

# 5. Methods used to evaluate student achievement

The MET department has over the years used the following methods to evaluate student achievement:

- Telephone Survey
- Fluid Power Certification Exam
- Exit interviews with graduating seniors
- Feed back from employers
- Employment statistics
- Feedback from MET industrial advisory board

The following course evaluations, national surveys and examination are being added to provide measurable outcomes:

• Capstone design course performance

The capstone course will use external jurors to evaluate course objectives. Survey instruments to be used for course evaluation will be modeled after the SUCCEED survey instrument developed for capstone courses. Specific survey instruments available for the capstone course from SUCCEED include:

Student Survey Faculty Course Instructor or Coach Survey Industrial Coach or Project Contact/Sponsor Survey Student Peer Survey Project Scoring Rubric for Final Project Presentations

- University national surveys provided by the OUA
- Selected questions from past Fundamentals of Engineering (FE) Exam will be used in selected courses that are key for success on the FE exam. These questions will allow the faculty to determine how the MET students are performing to a national standard. This approach should allow the faculty to determine if specific curricula areas need to be strengthened.
- Performance of seniors on national Fundamentals of Engineering Exam. While this exam is for engineering and not engineering technology, some states including Oklahoma still allow ET students to sit for the exam. In the past year (2000/2001) five out of six (80%) attempting the exam were successful.

# 6. Assessment results are integrated into curriculum planning and program improvement by means of the department's Continuous Quality Improvement Plan (CQIP) that is structured as follows:

- A. Inputs to the CQIP are solicited from the following sources
  - Industrial Advisory Board (TAC of ABET accreditation requirement)
  - Student Exit Interviews
  - Alumni Assessment Survey
  - Employer Satisfaction Survey

- ABET Accreditation Reports
- IAB meeting minutes
- Results of the Fundamental of Engineering Exam
- B. MET prepares Summary Report of information from the CQIP sources
- C. The Summary Report is submitted to the IAB Set meeting date with IAB and MET
- D. IAB and MET faculty discuss Summary Report
  - Review past recommendations
  - Make suggested curriculum and program changes
  - Set timelines for implementation
- E. Prepare OSU Assessment Report
- F. Prepare Summary Newsletter for students/alumni/employers

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