**Texas A&M University-Central Texas**

ATTACHMENT TO ITEM

Bachelor of Science

with a major in Mechanical Engineering Technology

(CIP 15.0805.00)

**Program Review Outline**

BACKGROUND & PROGRAM DESCRIPTION

Administrative Unit: Department of Sciences and Mathematics within the College of Arts and Sciences

The Bachelor of Science (B.S.) in Mechanical Engineering Technology (MET) at Texas A&M University-Central Texas (A&M-Central Texas) is designed to prepare graduates for the application and implementation of mechanical engineering principles to mechanical systems. Though it is closely related to mechanical engineering, it is distinct in that the proposed curriculum focuses on hands-on learning and application in both laboratory and real-world settings rather than theory and conceptual designs. The B.S. MET will be the first engineering technology program at the university and extends the university’s mission of providing affordable and high-quality education into an important area of study. With its large military presence and growing industrial base, an engineering education will be very important to the local region. Additionally, the program ties into a highly popular program at Central Texas College and provides a path for students engaged in that program to complete a bachelor’s degree in engineering technology. The program is designed to be offered on the main campus in a face-to-face or hybrid format, as well as online.

Student Learning Outcomes

1. Identify, analyze, and solve broadly-defined engineering technology problems
2. Apply the knowledge, techniques, skills, and modern tools of the discipline
3. Apply current knowledge and adapt to emerging applications of mathematics, science, engineering, and technology
4. Design, develop, implement- , operate, and maintain mechanical systems
5. Improve processes by conducting, analyzing, and interpreting experiments using standard tests and measurements
6. Apply written, oral, and graphical communication in both technical and non-technical environments
7. Collaborate with others as a member or leader in an engineering team
8. Understand and commit to professional and ethical responsibilities including a respect for diversity
9. Commit to quality and continuous improvement by engaging in lifelong learning
10. Recognize the impact of engineering technology solutions in a societal and global context

The program will require 120 semester credit hours (SCH). The major field of study will consist of 12 SCH of lower level courses, 44 SCH of upper level required courses and 12 SCH of technical electives.

The proposed implementation date is fall 2019.

A&M-Central Texas certifies that the proposed new degree program meets the criteria under Texas Administrative Code, Title 19, Part 1, Chapter 5, Subchapter C, Rule §5.45 in regard to need, quality, financial and faculty resources, standards and costs. New costs during the first five years will not exceed $2 million.

# NEED

1. **Employment Opportunities**

With the rapid and continual advancement of new technologies in the United States, it is imperative that skilled professionals are available and able to maintain and even further advance these technologies in order to remain competitive in an increasingly digital global community. The Bureau of Labor Statistics reports that the job outlook for mechanical engineers is expected to grow 5% nationally between 2016 and 2026, with 48,400 annual job openings by 2026. The national average annual income is $55,360. Texas is expected to experience a 15% growth in jobs for this occupation (6,050 in 2014 to 6,930 by 2024), and has one of the highest average salaries at $121,470, making the projected growth in job openings for mechanical engineering technologists in Texas three times that of the national average. Additionally, the skills acquired in this program enable graduates to be competitive members of the workforce in other occupations such as petroleum engineers, electrical engineers, mathematicians, drafting technicians, solar energy engineers, and manufacturers.

1. **Projected Enrollment**

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| **Projected Enrollment** |  |  |  |  |  |
|  | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** |
| Students Returning from Previous Year |   | 28 | 48 | 63 | 73 |
| New Students | 28 | 32 | 36 | 40 | 44 |
| Total Number of Students | 28 | 60 | 84 | 103 | 117 |
|   |   |   |   |   |   |
| FTSE | 18 | 44 | 60 | 72 | 80 |
| Attrition Following Current Year | 0  | 2 | 1 | 2 | 2 |
| Graduates During Current Year |   | 10 | 20 | 29 | 36 |

1. **Existing State Programs**

Currently, there are four public universities in Texas offering similar programs (CIP 15.0805.00): Texas A&M University-Corpus Christi, University of Houston, University of North Texas, and Tarleton State University. No institutions in Bell County or adjacent counties offer a similar program.

# QUALITY & RESOURCES

1. **Faculty**

One current faculty member will dedicate full-time and another part-time to the program. One new faculty member will be hired prior to the second year of the program and another by the third year.

1. **Program Administration**

The B.S. in M.E.T. will be administered in the Department of Sciences and Mathematics within the College of Arts and Sciences with no additional administrative costs anticipated.

1. **Other Personnel**

At least one graduate assistant will be required to help faculty with laboratory projects and other classroom administrative needs.

1. **Supplies, Materials**

$15,000 has been allocated for unique supplies and laboratory item upkeep. The bulk of the cost for laboratory items has been allocated under equipment and facilities, and the upkeep and replacement of consumable items (i.e. tubing, flow meters, heating elements, etc.) has been allocated here.

1. **Library**

The library currently has access to an extensive range of engineering technology literature to support the university’s ongoing solar project. An additional $15,000 for material has been allocated in the first year to increase the library’s core holdings in the field, and $5,000 has been allocated each year thereafter to sustain the collection.

1. **Equipment and Facilities**

Courses will utilize current classrooms and laboratories. Additionally, one laboratory in Heritage Hall will be outfitted with the proper electrical requirements for program needs. $80,000 has been allocated in the first three years for initial laboratory set-up.

1. **Accreditation**

Faculty intend to apply for national accreditation through ABET following the first five-year academic program review.

1. **NEW FIVE-YEAR COSTS & FUNDING SOURCES**

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| **NEW FIVE-YEAR COSTS** |  | **SOURCES OF FUNDING** |
| Faculty | $1,381,100  |  | Formula Income | $363,276  |
| Program Administration | $0 | Statutory Tuition | $409,954 |
| Graduate Assistants | $35,000 | Reallocation | $151,730 |
| Supplies & Materials | $75,000 | Designated Tuition | $1,209,917 |
| Library & IT Resources | $60,000 | Course Fees | $92,646 |
| Equipment, Facilities | $80,000 |  |  |
|  |  | Other Funding: |  |
| Other |  | Yr2 Formula Funding | $21,603 |
| **Estimated 5-Year Costs** | $1,631,100 | **Estimated 5-Year Revenues** | $2,249,126  |