

**DATE:** July 27, 2006**SUBJECT:** University of Tennessee Chattanooga, Bachelors of Science in Mechanical Engineering**ACTION RECOMMENDED:** Approval

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**BACKGROUND INFORMATION:** The Engineering program at UT Chattanooga began in 1969 with approval of the Bachelor of Science in Engineering (BSE) degree offered to graduate students of a multidisciplinary academic program with concentrations in various engineering disciplines. The program was accredited by the Accreditation Board for Engineering and Technology (ABET) as a “non-traditional” program in 1975. Over the next two decades the program grew steadily by establishing a niche for multidisciplinary engineering education that differentiated UT Chattanooga from programs at other institutions. In the early 1990’s, engineering graduates from UT Chattanooga began to experience difficulties, particularly when seeking employment outside the immediate area of Chattanooga. Most corporate recruiters were seeking engineers with discipline specific degrees. The difficulties experienced by UT Chattanooga graduates continued and the College also experienced difficulty recruiting students. The faculty began moving toward discipline specific degree programs in the late 1990’s. By 2001, a revised mechanical engineering curriculum was in place and students were enrolled in the new concentration. The proposal is to establish the concentration as a free standing program.

**PROPOSED START-UP DATE:** Upon approval

Commission staff has reviewed program proposals according to the academic standards adopted by the Commission on November 14, 2002. Each standard is referenced below.

**1.1.20A MISSION:** The proposed program is consistent with the role and scope of the university. “UTC is dedicated to the education of students: to providing quality education to a diverse population of students to...enlighten and discipline their minds and their preparation for ethical and active leadership in civic, cultural, and professional life.” UTC is committed to “utilizing its intellectual resources and external partners to serve as a national model of an engaged metropolitan university whose faculty, staff, and students, in collaboration with external partners, employ the intellectual resources of the liberal arts and professional programs to enrich the lives of those served.”

**1.1.20B CURRICULUM:** The proposed curriculum requires completion of 128 semester hours. All courses are currently being offered and there are no proposed changes to the curriculum now offered as a concentration. The mechanical engineering curriculum provides options in Energy Systems and Mechanical Systems. The Energy Systems option emphasizes applications of

thermodynamics, fluid mechanics and heat transfer. The Mechanical Systems option emphasizes applications in the analysis and design of machine elements and mechanisms.

**1.1.20C ACADEMIC STANDARDS:** Admission, retention, and graduation requirements will be consistent with the institutional requirements of other undergraduate programs in the College of Engineering, as published in the institution's *Catalog*.

Student Projections	Projected Program Productivity		
	Full-time Enrollment	Part-time	Graduates
Year 1	110	28	16
Year 2	115	33	17
Year 3	125	38	18
Year 4	135	42	19
Year 5	150	47	20

**1.1.20D FACULTY:** No additional faculty is required.

**1.1.20E LIBRARY RESOURCES:** No additional library resources are required.

**1.1.20F ADMINISTRATION/ORGANIZATION:** The proposed program will be housed in the College of Engineering and administered by the Director of the Mechanical, Chemical, Civil, Environmental and Industrial Engineering Department.

**1.1.20G SUPPORT RESOURCES:** None indicated.

**1.1.20H FACILITIES/INSTRUCTIONAL EQUIPMENT:** In summer 2003, the College of Engineering and Computer Science at UT Chattanooga moved into a new Engineering, Mathematics, and Computer Science (EMCS) building. The 200,000 square foot facility provides adequate space and instructional equipment for all existing programs.

**1.1.20I STUDENT/EMPLOYER DEMANDS:** The nearest engineering program to UTC is at George Tech in Atlanta. Tuition for Tennessee residents attending Georgia Tech could be a financial hardship for many students as well as a drain on the state's future pool of engineering talent.

Mechanical engineering represents the largest segment of engineering with approximately 20 percent of all engineering enrollment. Most of the 330 colleges of engineering in the US offer BSME degrees. Demand for mechanical engineers is expected to remain strong for the foreseeable future, driven partly by the sharp decline since 9/11 in immigration of degreed mechanical engineers from abroad. In addition, there is a growing recognition that the United States needs to increase investment in engineering education in order to respond to the global competition coming from China and India where more than 1,000,000 students are now studying engineering, compared to less than 400,000 in the United States. This is reflected in the "National

SMART” program that will provide \$3.75 billion in funding over the next five years for low-income students majoring in physical, life, computer sciences, mathematics, technology or engineering.

**1.1.20J NO UNNECESSARY DUPLICATION:** Due to demand and location, approval of the proposed program is not expected to have a significant impact on enrollment at any other institution in the state. Similar programs exist at TSU, TTU, UTK, UTM, UoM and Vanderbilt University.

**1.1.20K COOPERATIVE INSTITUTIONS:** UTC is coordinating a joint grant with the Tennessee Department of Education, “Project Lead the Way,” designed to encourage more K-12 students to study engineering.

**1.1.20L DESEGREGATION:** The program will not impede the state’s effort to achieve racial diversity.

**1.1.20M ASSESSMENT/EVALUATION AND ACCREDITATION:** To ensure an ongoing evaluation process, the faculty and the program coordinator will assess the program based on progress toward established goals and attainment of objectives. Assessment results developed by individual faculty members are presented, reviewed, and approved monthly. The evaluation process will be used to provide feedback for program improvements. The existing concentration meets all ABET requirements for Mechanical Engineering programs, and was awarded the maximum six year term of accreditation in Fall 2004.

**1.1.20N ARTICULATION:** Significant increases in enrollment are anticipated due to the new articulation agreement with Chattanooga State Technical Community College to allow a seamless 2 + 2 plan of study for their pre-engineering students. Recruitment of transfer students will likely be enhanced by ten \$1,000 scholarships provided by the University of Chattanooga Foundation. These scholarships are matched by corporations and the College gift account will make it possible to offer full tuition scholarships to as many as 10 new transfer students. The Chattanooga Manufacturers Association has already committed to provide matching scholarships for new transfer students that come from Chattanooga State.

**1.1.20O EXTERNAL JUDGMENT** (Graduate Programs): N/A

**1.1.20P COST/BENEFIT/SOURCE:** The mechanical engineering program prepares mechanical engineering students for successful careers in industry and academia, and will enhance the mechanical engineering profession in the State of Tennessee. Most of the engineering students at UT Chattanooga are from the counties that make up the Chattanooga metropolitan area within Tennessee borders. UTC enrolls more part time students than any other Tennessee engineering program in Tennessee. UTC also enrolls many commuting engineering students. It would be a financial hardship for these students to attend any of the comparable institutions in Tennessee. UT Martin is the only other university in Tennessee that awards BSE degrees. Immediate, tangible benefits will accrue to graduates. Long term benefits will accrue to the university by making it easier to recruit students because of the ability to award the

discipline specific degree. There are no additional costs associated with establishing the concentration as a free standing degree.

**1.1.30 POST APPROVAL MONITORING:** An annual performance review of the proposed program will be conducted for the first five years following approval. The review will be based on goals established in the approved program proposal. At the end of this period, campus, governing board, and Commission staff will perform a summative evaluation. These goals include, but are not limited to enrollment and graduation, program costs, progress toward accreditation, library acquisitions, student performance and other goals set by the institution and agreed upon by governing board and Commission staff. As a result of this evaluation, if the program is found to be deficient, the Commission may recommend that the governing board terminate the program. Copies of such recommendation will be forwarded to the Education Committees of the General Assembly. The Commission may also choose to extend this period if additional time is needed and requested by the governing board.