

Unit Effectiveness Plan for 2001-2002
Department(Unit): Mechanical & Aerospace Engineering
College (Division): Dean - College of Engineering

Unit Mission or Purpose:

The mission of the Department of Mechanical and Aerospace Engineering is to:

1. Provide high-quality educational programs at the baccalaureate, masters, and doctoral level in mechanical and aerospace engineering,
2. Perform research in the various technical disciplines comprising the fields of mechanical and aerospace engineering, and
3. Provide service to the engineering profession through faculty involvement in professional societies, consulting and interaction with industry; and to the university community through faculty involvement in the life of the university.

In addition, the Department supports the core program of the College of Engineering by providing basic courses in engineering mechanics and thermal engineering and contributes to interdisciplinary programs at the graduate level in materials science and engineering.

Articulation of how unit mission/purpose relates to University mission:

As one of the many academic components of the University, the Department of Mechanical and Aerospace Engineering supports the University mission by offering undergraduate and graduate degree programs that instill in its students a desire to pursue knowledge, truth and excellence, a respect for the diversity of opinions, a sense of professional and social responsibility, a commitment to life long learning, and a commitment to discover new knowledge through research.

Intended outcome	Related Institutional Goal/Objective/Strategy	Action Steps	Method of Assessment (Who, What, When)	Results of Assessment	Proposed Changes and Recommendations for Improvement	Resources Needed for Proposed Changes
1. Undergraduate student learning outcome #1 -- Upon completion of the undergraduate program in Mechanical Engineering (ME) or Aerospace Engineering (AE), graduates will 1. Be able to apply knowledge of mathematics, science and engineering. 2. Be able to design and	Goal 1 The University of Texas at Arlington will provide an environment that fosters broad-based education as well as professional studies designed to facilitate successful careers, personal development, and community service. Objective 1.1 To promote and sustain the	Increased emphasis on these areas will be integrated into the undergraduate engineering program. The undergraduate laboratory sequence will be upgraded with new material and new equipment.	Annual surveys of students and faculty will focus on the student's preparedness in these areas. Additionally, mastery will be assessed by reviewing results of employer surveys and the FE exam, given each spring by the Texas Board of Professional Engineering. Results will be analyzed for areas of strengths and weaknesses	1. Surveys of student perception of preparation in these areas: Outcome 1.1,ME +13%, AE -14% Outcome 1.2,ME + 9%, AE - 5% Outcome 1.3,ME + 9%, AE - 7% Outcome 1.4,ME +12%, AE - 1%	Proposed changes (Chair and Executive Committee): 1. Additional effort by AE faculty is required to improve student perception of preparation in these four areas 2. develop program to improve ME	Funding expenditures of approximately \$200,000 will be required for additional laboratory upgrades.

<p>conduct experiments, as well as to analyze and interpret data. 3. Be able to use the techniques, skills and modern engineering tools necessary for engineering practice. 4. Be able to identify, formulate, and solve engineering problems.</p>	<p>excellence of undergraduate programs that prepare students for careers and graduate studies.</p>		<p>by the Executive Committee and presented to the faculty for review, with recommendations for improvement of the program as needed.</p>	<p>2. Insufficient data was obtained from employer surveys to draw any conclusions. 3. FE Exam passing rate FL01: ME 100%, AE N/A SP02: ME 61%, AE 100% This compares to 62% (ME) and 67% (AE) in SP99 4. Numerous complaints from students on state of equipment in several labs</p>	<p>student performance on FE Exam 3. Revise employer survey procedure 4. Improve lab equipment in ME Measurements II Lab and AE Structures Lab</p>	
<p>2. Undergraduate student learning outcome #2 -- Upon completion of the undergraduate program in Mechanical Engineering (ME) or Aerospace Engineering (AE), graduates will 1. Be able to design a system, component or process to meet needs 2. Be able to function on multi-disciplinary design teams</p>	<p>Goal 1. The University of Texas at Arlington will provide an environment that fosters broad-based education as well as professional studies designed to facilitate successful careers, personal development, and community service. Objective 1.1 To promote and sustain the excellence of undergraduate programs that prepare students for careers and graduate studies.</p>	<p>Engineering design will be integrated across the entire undergraduate curriculum, starting with the Freshman Introduction to Mechanical and Aerospace Engineering course and culminating with the capstone Senior Design Course sequence.</p>	<p>1. Senior design course presentations will be judged by a panel of faculty members on both technical content and quality of oral presentation. 2. Support will be solicited from industry for senior design projects, and representatives from those industries will be invited to the senior design team presentations. 3. Assessment results from faculty and industry judges will be reviewed annually by the Chair and Academic Program Directors.</p>	<p>Results 1. Senior design report presentations have improved in the last two years, with increased use of computer-generated power point presentations 2. Funding support for senior design projects has increased in ME. No income has been generated for AE</p>	<p>Proposed changes Increase efforts to attract industry funding support for senior design projects</p>	<p>None</p>

			Recommendations for changes, if required, will be presented to the faculty.	Projects		
3. Graduate student learning outcome #1 -- Upon completion of graduate degrees in Mechanical Engineering (ME) or Aerospace Engineering (AE), our graduates will have skills comparable to those from outstanding schools across the country.	<p>Goal 1. The University of Texas at Arlington will provide an environment that fosters broad-based education as well as professional studies designed to facilitate successful careers, personal development, and community service.</p> <p>Goal 3. The University of Texas at Arlington will strive to meet the lifelong educational needs of all members of the community.</p>	1. An ongoing review of current graduate courses will be completed this fall. Revisions to several courses have been made, several new courses have been introduced, and other courses, if needed, will be developed for inclusion in the new graduate catalog.	<p>1. UTA course offerings will be benchmarked against other universities.</p> <p>2. The Industry Advisory Board will be requested to review the graduate course offerings and provide recommendations for further changes as needed.</p> <p>3. Employers of UTA graduates will be surveyed to assess how their performance compares with those from competitive schools.</p>	<p>Results</p> <p>1. UTA graduate courses are comparable to those of leading engineering institutions.</p> <p>2. Surveys of graduate students on their perception of the graduate program show a 7 % increase in theory, and a 7 to 8 % drop in tools and communication skills over the past two years</p> <p>3. IAB will focus on graduate program in its meeting next year</p> <p>4. Insufficient data were obtained from employer survey to draw any conclusions</p>	Proposed changes	None
4. Graduate student learning outcome #2 -- The quality of research performed by graduate	Goal 1: The University of Texas at Arlington will provide an environment that fosters broad-based	1. Graduate instruction will increase emphasize on the use of modern computational and	1. An evaluation form will be used by thesis, dissertation and comprehensive examination	Results	Proposed changes	None
				1. Laboratory upgrades have only recently	1. Perform the assessment during the next cycle	

students in Mechanical or Aerospace Engineering will be improved by providing access to modern tools and equipment.	education as well as professional studies designed to facilitate successful careers, personal development, and community service. Goal 3: The University of Texas at Arlington will strive to meet the lifelong educational needs of all members of the community.	experimental tools and equipment. 2. Additional funding sources will be sought to continue modernization of computational and experimental research laboratories. 3. Industry and government labs will be approached for equipment donations.	committees to assess the impact of using state of the art equipment on the quality of the student's research. 2. When appropriate, adjunct committee members from industry will be requested to provide an assessment of the quality of graduate student research.	been completed. Insufficient time has elapsed to perform a meaningful		
5. Oral communication student learning outcome -- MAE undergraduates will demonstrate proficiency in oral communication skills including the use of acceptable grammar and pronunciation in formal presentations.	Goal 1: The University of Texas at Arlington will provide an environment that fosters broad-based education as well as professional studies designed to facilitate successful careers, personal development, and community service. Objective 1.1: To promote and sustain the excellence of undergraduate programs that prepare students for careers and graduate studies.	1. Students, as part of their degree plan, are required to complete SPCH 3302 which includes one or more oral presentations which are assessed by the course instructor and others. 2. Students will be required to give oral presentations in their capstone design courses.	1. Successful completion of SPCH 3302 is required for the BS in ME and AE. It is on all degree plans and the registrar's office checks the degree plan prior to certifying students for graduation. 2. Oral presentations in the capstone design courses will be evaluated by the course instructor, other students, and a panel of invited faculty members. Presentations will be judged on clarity, technical understanding, organization and content.	Results 1. All students successfully complete SPCH 3302 2. Oral presentation skills have improved in the capstone design course	Proposed changes 1. Continue to emphasize the importance of oral communications	None
6. Computer literacy student learning outcome -- MAE undergraduates will demonstrate proficiency in computer literacy including email, word processing,	Goal 1: The University of Texas at Arlington will provide an environment that fosters broad-based education as well as professional studies designed to facilitate	1. Students, as part of their degree plan, are required to take MAE 1231, DG 1350 and MAE 2360, which include instruction in computer literacy and basic engineering tools. A lab	1. Correlate student performance on assignments designed to test computer literacy knowledge of basic engineering computational tools in upper division	Results 1. Faculty assessment of the student's computer skills ranked 2.27 on a scale of	Proposed changes Continue to upgrade software and hardware in department's computer labs	Approximately \$50,000 per year will be required to continue to upgrade computer software and hardware on a

spreadsheets, use of the internet and on-line library resources for research; and engineering tools including FORTRAN, C, ProE and MATLAB.	successful careers, personal development, and community service. Goal 2: The University of Texas at Arlington will provide access to learning opportunities for all students.	was added to MAE 2360 to include hands-on instruction in FORTRAN, C and MATLAB, and ProE is now introduced in DG 1350. 2. Implement assignments in upper division courses that require demonstration of computer competencies acquired in MAE 1231 and MAE 2360.	courses with student's performance in MAE 1231, DG 1350 and MAE 2360. Use the results as feedback for changes in curriculum content as needed. 2. Survey student perception of quality of computer instruction during exit interviews.	1 ? No improvement 2 ? Some improvement 3 ? Substantial improvement 2. Student perception of their computer skills increased 4 5 for ME students and 14 % for AE students over the last two years.		timely basis
7. Service outcome -- The department will increase the number of faculty involved in service activities in the mechanical and aerospace engineering community.	Goal 6: The University of Texas at Arlington, in partnership with the broader community, will contribute to dynamic and continuing economic, social, and cultural development.	1. Encourage more members of the faculty to become involved in professional society activities (service on technical committees, chairing sessions, reviewing articles for journal publication, consulting, etc.) 2. Initiate efforts to have qualified faculty promoted to Fellow status in their professional societies.	1. The Chair will track the number of faculty involved in professional service activities and include in the annual report to the MAE Industry Advisory Board. 2. Each year the Industry Advisory Board (IAB) reviews the MAE education, research and professional service programs. Department faculty and administrators will evaluate IAB recommendations and incorporate changes as appropriate.	Results 1. Faculty participation in professional society service activities has increased 60 % over the past few years 2. IAB recommendations are to continue to emphasize faculty participation in professional society activities	Proposed changes Continue to emphasize faculty participation	Increased travel funds are needed to allow faculty to attend professional society meetings, serve on technical committees and assume leadership roles in organizing technical meetings.
8. Research outcome -- The funding level and quality (as indicated by number of publications in archival journals) of faculty research will be	Goal 4: The University of Texas at Arlington will support an environment conducive to basic and applied research and creative activity, and the	1. Seek funding sources needed for improvement in research facilities. 2. Encourage faculty to develop more competitive research proposals.	Chair will compile data from faculty research activities, including number of proposals submitted, research funds received, and papers published for	Results 1. Proposals: 14% decline in number 2. Awards: 66 % increase in funding	Proposed changes 1. Continue to emphasize importance of scholarly research 2. Provide travel	Increased funding for travel to visit funding agencies is needed

<p>improved, which will increase the research reputation of the MAE department.</p>	<p>acquisition, preservation, and dissemination of knowledge.</p> <p>Objective 4.1 To increase the University's commitment to research and creative activity.</p> <p>Objective 4.2 To increase the number of opportunities for faculty development</p> <p>Goal 5: The University of Texas at Arlington will ensure that research programs of the highest quality involve qualified students.</p>	<p>3. Encourage faculty to involve more graduate students in funded research programs.</p> <p>4. Continue to provide research salary supplements to faculty that are successful in acquiring funded research programs.</p>	<p>each academic year. Chair will compile data on growth of research productivity (proposals, awards, publications, etc.)</p>	<p>3. Journal articles: 8 % decline</p> <p>4. Conference papers: 14 % increase (Period: AY 2000 to AY 2002)</p>	<p>funds for faculty to visit funding agencies to market proposals</p> <p>3. Increase visits to industry to discuss research programs</p>	
<p>9. Advising outcome -- each lower division ME and AE student will receive a level of advising that will allow them to make satisfactory progress, based on individual capabilities, toward admission to the professional (upper division) program.</p>	<p>Goal 1: The University of Texas at Arlington will provide an environment that fosters broad-based education as well as professional studies designed to facilitate successful careers, personal development, and community service.</p> <p>Goal 2: The University of Texas at Arlington will provide access to learning opportunities for all students.</p>	<p>1. Each lower division ME or AE student will be advised each semester by the academic program director in their respective programs</p> <p>2. The Academic Program Directors will track students to determine level of progress.</p> <p>3. Continue to provide more online advising opportunities for students.</p>	<p>Student surveys will be conducted on an annual basis by the undergraduate advisor and used to determine student's perception of academic advising and whether additional improvements are needed.</p>	<p>Results</p> <p>1. Student surveys and exit interviews indicate increased satisfaction with quality of advising</p> <p>2. Students in the AE Program are enthusiastic about on-line advising</p>	<p>Proposed changes</p> <p>1. Implement on-line advising in ME Program</p>	<p>None</p>

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