

Department: Mechanical, Materials, & Aerospace Engineering  
 Chair: L.C. Chow  
 Contact: J.F. Nayfeh  
 Participating faculty: All

Program Name & CIP Code: Mechanical Engineering 14.1901  
 Level: BSM/E Undergraduate

Example of Linkage between Expanded Statement of Institutional Purpose,  
 Departmental/Program Intended Outcomes/Objectives, Assessment Criteria and Procedures,  
 Results, and Use of Results at our University

Expanded Statement of Institutional Purpose	Departmental/Program Intended Outcomes/Objectives	Assessment Criteria & Procedures	Assessment Results	Use of Results
Offer the best undergraduate education in Florida	1. Students completing the undergraduate program in Mechanical Engineering will be competent in the application of engineering principles.	1a. Surveys of graduating seniors and employers will be conducted, with the goal of at least 75% of the respondents expressing satisfaction with the program in providing competency in the application of engineering principles. 1b. Senior capstone design reports will be reviewed by the Undergraduate Student Performance Assessment Committee to assess whether at least 80% of the students have acceptable competency in the application of engineering principles.	1a. 100% of graduating seniors responded to survey. 96.77% expressed satisfaction with the program in providing competency in the application of mathematics, science, and engineering principles (3.23% - not satisfied; 58.06% - very satisfied; 38.71% - satisfied). Local employers and the MAAE Industrial Advisory Committee expressed an overwhelming satisfaction with the program. 1b. USPAC conducted a total of 64 independent evaluations of all senior capstone interdisciplinary Mechanical / Aerospace design projects. 96.88% of all evaluations indicate that the students have acceptable competency in the application of mathematics, science, and engineering principles (96.88% - yes; 3.12% - no).	1a. USPAC recommended minor curricular improvement measures (as suggested by the students) to the Undergraduate Curriculum and Standards Committee and the faculty. No deficiencies are found. 1b. USPAC recommended minor curricular changes and adjustments to be acted upon by the UCSC. No deficiencies are found.

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	<p>2. Graduates will be able to apply the principles of engineering design, formulating requirements and constraints, following an open-ended decision process involving tradeoffs, completing a design addressing a mechanical engineering need.</p>	<p>2a. Senior capstone design projects will be reviewed by the Undergraduate Student Performance Assessment Committee to assess whether or not at least 80% of the students have acceptable design competency.          2b. Senior capstone design projects* will be reviewed by the Undergraduate Student Performance Assessment Committee to assess whether or not at least 80% of the students demonstrate effective written and oral communication competency.</p>	<p>2a. USPAC evaluators of all senior capstone interdisciplinary Mechanical / Aerospace design projects show that 92.19% of the students have acceptable design competency and are judged to be able to identify, formulate, and solve real-world engineering problems. (92.19% - yes; 7.81% - no).          2b. USPAC evaluators of all senior capstone interdisciplinary Mechanical / Aerospace design projects show that 93.75% of the students demonstrated effective written (judged from documented reports) and oral communication (judged from recorded video presentations) competency (93.75% - yes; 6.25% - no).</p>	<p>2a. USPAC recommended to the UCSC that all faculty get involved in the senior capstone design projects. Faculty mentors and advisors will be assigned to all projects. No deficiencies are found.          2b. USPAC recommended improvement measures to the UCSC as suggested by students, faculty, and the MAAE Industrial Advisory Committee. No deficiencies are found.</p>

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	<p>3. Graduates will be competent in the use of computer methods.</p>	<p>3a. Senior capstone design reports will be reviewed by the Undergraduate Student Performance Assessment Committee to assess whether or not at least 80% of the students demonstrate satisfactory use of computer technology.          3b. Students' satisfaction with their computer competency in preparing them for their careers will be surveyed* with the goal of 80% expressing satisfaction.</p>	<p>3a. USPAC evaluations of all senior capstone interdisciplinary Mechanical / Aerospace design projects show that 95.31% of the students demonstrated satisfactory use of in-house computer software and/or hardware. (95.31% - yes; 4.69% - no).          3b. 100% graduating seniors responded the survey. 87.1% expressed satisfaction with their competency and ability to use the computer as an effective technical problem solving tool.</p>	<p>3a. USPAC recommended to the UCSC and the faculty that MMAE computer hardware and software resources (and laboratory equipment) should be increased in quantity and quality and updated continuously. No deficiencies are found.          3b. USPAC reviewed comments on students' evaluations and recommended to the UCSC and the faculty that more computer and laboratory hands-on experience projects should be implemented. No deficiencies are found.</p>

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	<p>4. Students completing the undergraduate program in Mechanical Engineering will compare favorably with students who complete a similar program nationally.</p>	<p>4a. At least one student team will enter one major mechanical engineering competition, with the goal of placing in the top 25%.            4b. Surveys* of graduating seniors and employers will be conducted, with the goal of at least 75% of the respondents expressing satisfaction with the program in providing ABET competencies.</p>	<p>4a. MMAE SAE/Mini Baja Club placed 4<sup>th</sup> in the East Competition (Cookeville, Tennessee, April 1998). Over 40 teams from the US and Canada universities) and 3<sup>rd</sup> in the West Competition (El-Paso, Texas, May 1998; 72 teams from the US, Canada, and Mexico universities). MMAE Aerospace Engineering students placed 3<sup>rd</sup> in Aero Design East (Deland, Florida; April 1998). Over 20 international teams). AIAA, SAE, ASME, ASHRAE, ASM and SAE student chapters participated in regional and national design competitions and placed in the top 20%.            4b. 100% of graduating seniors responded to survey. 83.8% expressed satisfaction with the program in providing ABET competencies and quality of education received in "core" and "major" engineering courses offered at UCF. Local employers and the MMAE Industrial Advisory Committee expressed an overwhelming satisfaction with the program's ABET competencies.</p>	<p>4a. USPAC recommended the continuation of encouragement, recognition, and support of all MMAE professional student chapters and club activities relating to regional and national engineering competitions. No deficiencies are found.            4b. USPAC recommended curricular renewal changes to UCSC and the faculty that will address ABET 2000 criteria. No deficiencies are found.</p>