



Arkansas Academy of Mechanical Engineering

Strategic Plan

21 April 2012

Revision History

23 Jan 2012: Creation and refinement of the AAME Strategic plan

20 Apr 2012: Added 6.4 to address diversity in AAME, Added Revision History page

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Executive Summary

Mechanical Engineering is an engineering discipline that is at the center of solving many of humanity's grand challenges. Mechanical engineers are involved in exploring new sources of renewable energy, improving energy efficiency of mechanical systems, developing new tools for medical diagnostics and treatments, and devising ways to create a cleaner and healthier environment.

Society has a growing need for highly trained and well-educated engineers who are able to contribute to the solution of the grand engineering challenges.

This strategic plan concludes with a set of actions that are aimed at further enhancing the efforts of the Arkansas Academy of Mechanical Engineering and its support to the profession, the University of Arkansas Mechanical Engineering department, the State of Arkansas and the Nation.

This strategic plan is the result of the recommendations put forth by the Board of Directors for the Arkansas Academy of Mechanical Engineering working with and in conjunction with the University of Arkansas Department of Mechanical Engineering.

Mission of the Arkansas Academy of Mechanical Engineering

To promote and support the mechanical engineering profession, to honor the Mechanical Engineer and to work with the University of Arkansas Department of Mechanical Engineering to increase the appeal of Mechanical Engineering and further the educational development of future engineers.

Vision

The Arkansas Academy of Mechanical Engineering vision is to be one of the premier organizations in supporting the development of the mechanical engineering profession and to work with the utmost devotion to boost the standard of excellence within the field. We do this by promoting strong moral integrity, supporting the mechanical engineer educational experiences, mentoring young engineers and educating the state and the nation in the importance of mechanical engineers in our society.

Goals

Goal 1. Clearly define a vision and plan for AAME and create an administrative structure to maintain that vision and plan.

Strategies:

- 1.1 Establish low-overhead communications with alumni via annual newsletter.
- 1.2 Implement an informative and attractive web site.
- 1.3. Define the role of the Board of Directors in administering the Academy.

Goal 2. Promote the Mechanical Engineering Profession.

Strategies:

- 2.1. Recognize mechanical engineers for career achievement
- 2.2. Promote the mechanical engineering profession throughout industry and education.
- 2.3. Work with the state and communities promoting an understanding and benefits of the mechanical engineering discipline.
- 2.4. Serve as mentors to junior engineers
- 2.5. Support and work with professional engineering societies to help promote the Mechanical Engineering discipline

Goal 3. Clearly define the roles and responsibility of the AAME in the context of the University of Arkansas Department of Mechanical Engineering.

Strategies:

- 3.1. Work with the ME Department Head to achieve common goals
- 3.2. Understand and delineate the expectations of the department and faculty.
- 3.3. Understand the position of the ME department in the college and university structure.

Goal 4. Support the Mechanical Engineering Department's Conceive, Design, Implement, Operate (CDIO) program

An engineering education set in the context of Conceive, Design, Implement, Operate (CDIO) product-process life cycle is more closely aligned with industry's work environment than prior engineering education programs. Product-based and hands-on learning techniques dramatically increase student learning and the retention of engineering students in engineering programs

Strategies:

- 4.1. a. Conceive: Help define customer needs and then develop conceptual, technical and business plans to meet those needs while considering technology, enterprise strategies and regulations that apply.
- 4.1. b. Design: Help create the plan, drawings and algorithms that describe the product, process and systems that will be implemented
- 4.1. c. Implement: Help transform the design into a product that includes hardware, manufacturing, software coding, testing and validation
- 4.1. d. Operate: Use the delivered, implemented product, process and system to satisfy the intended value, to satisfy the customer.

- 4.2. Support the CDIO Goals
 - 4.2. a. Help develop and master a deep working knowledge of technical fundamentals
 - 4.2. b. Help the Department in becoming the leader in the creation of new products, processes and systems.
 - 4.2. c. Help develop an understanding in the importance and strategic impact of research and technological development on society.
- 4.3. Strive to develop internship opportunities in industry and the mechanical engineering field.
- 4.4. Serve as mentors to students and faculty members to help bridge the connection between the educational experience and professional development

Goal 5. Support the Mechanical Engineering education experience

Strategies:

- 5.1. Reinforce fundamental engineering and science principles and mathematical analysis skills throughout the curriculum
- 5.2. Help the ME Department provide state-of-the-art experimental facilities and a strong education in design, methods and data analysis
- 5.3. Emphasize skills for modern engineering practice including strong communication skills, teamwork, ethics, and the social/corporate context within which engineering decisions are made
- 5.4. Support industry involvement in the curriculum through capstone design projects, seminars, student research projects and co-instruction
- 5.5. Support national student design competition teams
- 5.6. Promote an active student professional society that achieves recognition regionally and nationally

Goal 6. Support diversity in the education and practicing Mechanical Engineering field

Strategies:

- 6.1. Increase the number of scholarships available for ME majors
- 6.2. Develop recruiting materials that reflect the friendly atmosphere and desired diversity of our students
- 6.3. Work closely with the U of A College of Engineering to assure we are serving our underrepresented students effectively
- 6.4. Strive to achieve the diversity goals of the Mechanical Engineering Department within AAME

Goal 7. Improve the mechanical engineers relationship within our community at the local, state and national level.

Strategies:

- 7.1. Achieve an effective advisory council, and steadily increase their participation in departmental activities
- 7.2. Establish low-overhead communications with alumni via annual newsletter
- 7.3. Implement and maintain an informative and attractive web site

7.4. Meet with local, state and national leaders

Strengths and Opportunities

- AAME is well established organization with dedicated active members
- Membership committed and driven to sustaining AAME and its goals in support of the U of A ME Department
- Budget in place and able to sustain drive to achieve goals
- Well established lines of communication open with the ME Department
- ME Department committed to meeting the needs of the students and faculty
- ME Department committed to the goals of CDIO
- Highly motivated and committed faculty
- Facilities and infrastructure in place

Threats and Weaknesses

- Uncertain future of state higher education system, and its support for U of A programs
- Ill-defined and constantly shifting expectations
- No clear vision of how program can progress to achieve excellence and recognition
- Lack of resources
- Diminished alumni resources, connections, and communications
- Development of innovative solutions to increase revenue to the maximum

Outcomes

The following attributes of our program and graduates reflect the priorities of our members and the Mechanical Engineering Department.

These attributes will be used to assess the success of our program.

Attributes of AAME

Career minded, experienced and successful mechanical engineers
Dedicated to support the U of A Mechanical Engineering Department
Philanthropic supporter of AAME and the ME Department
Mentor and supporter of ME students

Attributes of Bachelor of Science in Mechanical Engineering graduates

Highest priority:

Well-grounded in application of fundamental principles
Well-grounded in fundamental engineering & science principles
Ability to communicate effectively, oral and written
Ability to identify, formulate and solve engineering problems
Ability to work on teams
Recognition of the need to pursue life-long learning
Ability to design a system, component or process to meet needs
Interdisciplinary design ability

An understanding of professional and ethical responsibility
Ability to use computers and all design enhancement tools effectively
Ability to analyze and interpret data
Strong mathematical analysis skills
Faculty members who are professionally current and active
Strong mentoring between membership, faculty and students
Continuous self-assessment program in place
High quality student academic performance
Maintains close relationships with industry
Emphasis on teamwork
Hands-on design integrated throughout curriculum over all four years

Important, but lower priority:

Extensive internship and technical employment opportunities
Current technical issues integrated throughout curriculum
Good financial support available for undergraduates (scholarships, etc.)
External funds available to support applied research efforts
Modern experimental facilities
Attract and retain top high school students
Cross-disciplinary opportunities via minors, merged majors, breadth electives