

SAN DIEGO STATE UNIVERSITY
MESA ENGINEERING PROGRAM (MEP)
PROGRAM SUMMARY AND PROGRAM DESCRIPTION

July 18, 2005

SDSU-MEP PROGRAM SUMMARY

Program Overview

The SDSU MESA Engineering Program (MEP) is part of the California MESA Statewide Program, an exemplary and award winning statewide model for academic excellence in math, engineering and science with over thirty years of success in pre-college, community college and university levels. The goal of MEP at San Diego State University is to provide an environment and a support system, for educationally disadvantaged students and to graduate qualified engineers with marketable skills for industry and/or graduate school.

Student Services

On a yearly basis this program serves approximately 275 students. SDSU MEP, along with input from industry and other San Diego MESA programs, has pioneered the development of the MESA Academic Excellence Plan, based on specific industry driven standards. The MESA Standards is a comprehensive set of achievements for student development and success – academically, personally and professionally. The plan promotes standards in the areas of *Counseling, Academic Support, University Bridging, Industry Exposure and Community*.

Collaborative Efforts

An Industry Advisory Board made up of local engineering companies has been a great resource leveraged to assist MEP carry out its vision. The IAB provides key support to the professional development of the students. The IAB not only provides major-related internships, but also helps to gain financial support for scholarships, offers seminars and hosts activities.

In 1991 the SDSU College of Sciences implemented a Maximizing Science Potential Program (MSP) modeled after MEP. MSP via MEP provides services to physical science majors: astronomy, chemistry, computer science, mathematics, physics, and geological science.

In 2000, the SDSU MEP co-founded the San Diego MESA Alliance (SDMA), a statewide model for intersegmental regional collaboration in math, engineering and science education for underrepresented and economically disadvantaged student populations.

Awards and Successes

The California MESA Statewide Program received: 1) the *2001 Innovations in American Government* Award from the Ford Foundation and the Institute for Government Innovation at Harvard University's John F. Kennedy School of Government and 2) the *2000 U.S. Presidential Award for Excellence in Science, Mathematics and Engineering Mentoring*.

In the last 10 years, the SDSU MEP has successfully graduated over 400 students. Many of those graduates continue to support the program in many ways including participating on the IAB, mentoring, or donating funds. Since 1995, over 1,300 MEP/MSP students have attended Academic Excellence Workshops (some students participate in more than one workshop). On average, these students received a higher letter grade than those who did not participate.

New Initiatives

The College of Engineering at SDSU provides the core support for two professionals to facilitate the program. Donations from MEP alumni and local industry partially cover the operating expenses and program funding that MEP no longer receives from the California MESA Statewide Program, due to the California budget crisis. Only through these local industry and alumni donations are services currently available to students. With additional funding new initiatives include: 1) *Increase number of students*: by hiring two additional staff members to provide evaluation and program support, 2) *MESA Saturday Training Academies*: Company sponsored and facilitated training sessions to further prepare students for internships and/or careers, 3) *MESA Advantage*: Key internships in industry for those students who successfully work toward completion of MESA Standards, 4) *MESA Bridging*: providing community college students with summer cross-over classes prior to transfer assisting in their transition and allowing them to obtain internships at earlier levels, and graduate sooner, and 5) *MESA Scholars*: To provide students with scholarships and research projects with engineering faculty, improving their preparation, ability and desire to enter graduate school.

SDSU-MEP PROGRAM DESCRIPTION

Program Overview

The California MESA Program is an exemplary and award winning statewide model for academic excellence in math, engineering and science with over thirty years of success in pre-college, community college and university levels. The MESA Engineering Program (MEP) at San Diego State University (SDSU), although not funded by, is part of the California MESA Statewide Program. The goal of MEP at SDSU is to provide an environment and a support system, for educationally disadvantaged students, with the College of Engineering to graduate qualified engineers with marketable skills for industry and/or graduate school and to prepare each individual for lifelong learning beyond SDSU.

Student Services

The SDSU MEP Center serves approximately 275 students yearly. In fall of 2004 the enrollment was 268 students. See below for the enrollment and composition of the students.

Table 1. SDSU MEP Fall 2004 Enrollment by Major, Gender, Ethnicity

MAJOR	AFRICAN AMER.		LATINO		NATIVE AMER.		OTHER		Program Total	%	COLLEGE
	M	F	M	F	M	F	M	F			TOTAL
Aerospace Engr.	2	0	6	1	0	0	6	3	18	7%	162
Civil Engr.	5	2	24	8	1	0	12	4	56	21%	395
Computer Engr.	8	1	24	2	0	0	15	6	56	21%	365
Electrical Engr.	6	2	16	8	0	1	12	4	49	18%	381
Env Engr.	1	0	1	3	0	0	1	0	6	2%	34
Mechanical Engr.	2	0	18	4	0	0	11	2	37	14%	399
Computer Science	1	0	3	1	0	0	3	4	12	4%	401
Physical Sciences	1	3	10	7	0	0	7	6	34	13%	692
Sub-Total	26	8	102	34	1	1	67	29	268	100.0%	1736~
%	10%	3%	38%	13%	0%	0%	25%	11%	100%		

*Physical Science Majors (Astronomy, Bio-Engineering, Chemistry, Geology, Mathematics, Physics) are all housed in the College Of Sciences).

~1736 undergraduates in the College of Engineering

Chart 1. Ethnic/racial composition of fall 2004 SDSU MEP enrollment

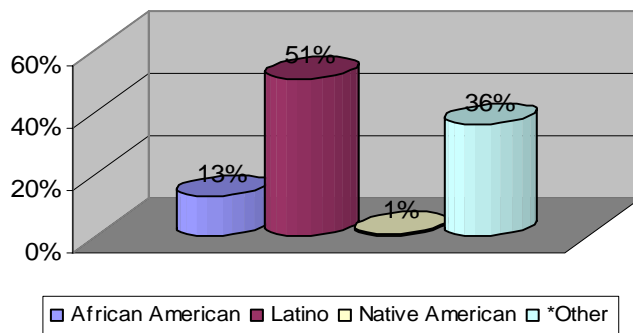
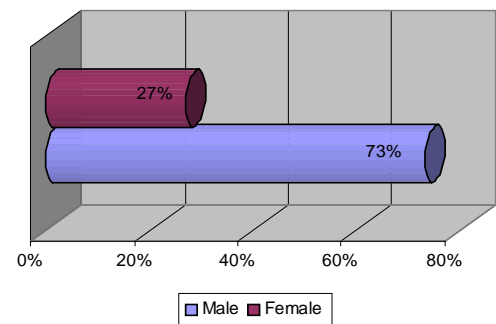


Chart 2. Gender composition of fall 2004 SDSU MEP enrollment



MEP focuses on student development to become better qualified to gain technical opportunities during their undergraduate experience (i.e. internships, student leadership, etc.). In order for young people to have choices upon graduation, they must have the skills and experiences to market themselves effectively. Consequently these undergraduate experiences will optimize their professional options while positioning them for additional opportunities upon graduation.

MEP, along with input from industry and other San Diego MESA programs, has pioneered the development of the MESA Academic Excellence Plan, based on specific industry driven standards. The MESA Standards is a comprehensive set of achievements for student development and success – academically, personally and professionally. The plan promotes standards in the areas of *Counseling, Academic Support, University Bridging, Industry Exposure and Community*. A summary of the MEP services to assist each student meet the standards are provided in Table 2 below:

Table 2: MEP Student Standards Based on Industry Needs

1. COUNSELING	
Required—Participating students must:	Optional—Participating students may choose to:
<ul style="list-style-type: none"> o Complete educational plan o Meet with counselor once per semester to review progress in major o Complete department Master Plan o Maintain updated degree evaluations on file 	<ul style="list-style-type: none"> o None
2. ACADEMIC SUPPORT	
Required—Participating students must:	Optional—Participating students may choose to:
<ul style="list-style-type: none"> o Complete MEP orientation course o Participate in Academic Excellence Workshops (AEW) & Course Clustering o Complete progress report each semester o Complete time management plan each semester o Apply for scholarships/financial aid on a yearly basis 	<ul style="list-style-type: none"> o Serve as AEW facilitator or tutor o Act as a peer mentor o Attend academic seminars (i.e. junior/senior seminar) o Receive tutoring (required if GPA < 2.5)
3. HIGHER EDUCATIONAL ADVANCEMENT (UNIVERSITY BRIDGING)	
Required—Participating students must:	Optional—Participating students may choose to:
<ul style="list-style-type: none"> o Research opportunities for educational advancement o Establish connection to student support services o Explore and participate in research opportunities 	<ul style="list-style-type: none"> o Participate in university workshops and conferences o Attend graduate school seminars
4. INDUSTRY EXPOSURE	
Required—Participating students must:	Optional—Participating students may choose to:
<ul style="list-style-type: none"> o Join a student chapter o Create resume and cover letter o Develop interview skills o Research companies o Conduct informational interviews (minimum 2) o Take industry tours o Attend a job shadow experience 	<ul style="list-style-type: none"> o Work with an industry mentor o Serve as student chapter officer o Engage in mock interviews o Spend time on a volunteership o Work in an internship o Attend industry workshops and conferences (such as MESA Leadership Summit)
5. COMMUNITY	
Required—Participating students must:	Optional—Participating students may choose to:
<ul style="list-style-type: none"> o Perform educational/engineering related community service (15 hours minimum per semester) 	<ul style="list-style-type: none"> o Tutor/mentor peers

Collaborative Efforts

An Industry Advisory Board made up of local engineering companies has been a great resource leveraged to assist MEP carry out its vision. The IAB provides key support to the professional development of the students. The IAB not only provides major-related internships, but also helps to gain financial support for scholarships, offers seminars and hosts activities.

In addition, the IAB serves as a tool to apply pressure on the faculty, college of engineering, and the university to see the value and need of retention/diversity programs such as MEP. Grant proposals will continue to be written to obtain funds for research opportunities, a summer math/science bridge program, and other activities, events, and services no longer funded by the MESA Statewide Program.

In 1991 the SDSU College of Sciences implemented a Maximizing Science Potential Program (MSP) modeled after MEP. MSP via MEP provides services to physical science majors: astronomy, chemistry, computer science, mathematics, physics, and geological science. Since the inception of MSP, the two programs have collaborated in many areas. Each spring students involved in undergraduate research are given the opportunity to present their research at the Annual Undergraduate Research Symposium hosted by these two programs along with others in the college of sciences.

In addition, the SDSU MEP is a founding member of the San Diego MESA Alliance (SDMA). Formed in summer 2000, the SDMA is a statewide model for intersegmental regional collaboration in math, engineering and science education for underrepresented and economically disadvantaged student populations. The SDMA boasts a membership of three sister programs from MESA educational divisions, including:

- Community College: San Diego City College and Southwestern Community College
- University: San Diego State University

The SDMA mission is to have a collaborative effort in enhancing the pipeline for MESA programs in San Diego County. The SDMA goals are to establish best practices, strategic partnerships, effective coordination of services and development of core curriculum for MESA programs. Excellent examples of intersegmental collaboration are the three SDMA signature activities: a Walk-on-Water Competition (fall), a Leadership Summit (spring), and a Robotics Challenge/Calculator Olympics (spring) each with industry sponsorship. These signature activities support MESA's mission to promote academic success and leadership development.

Awards

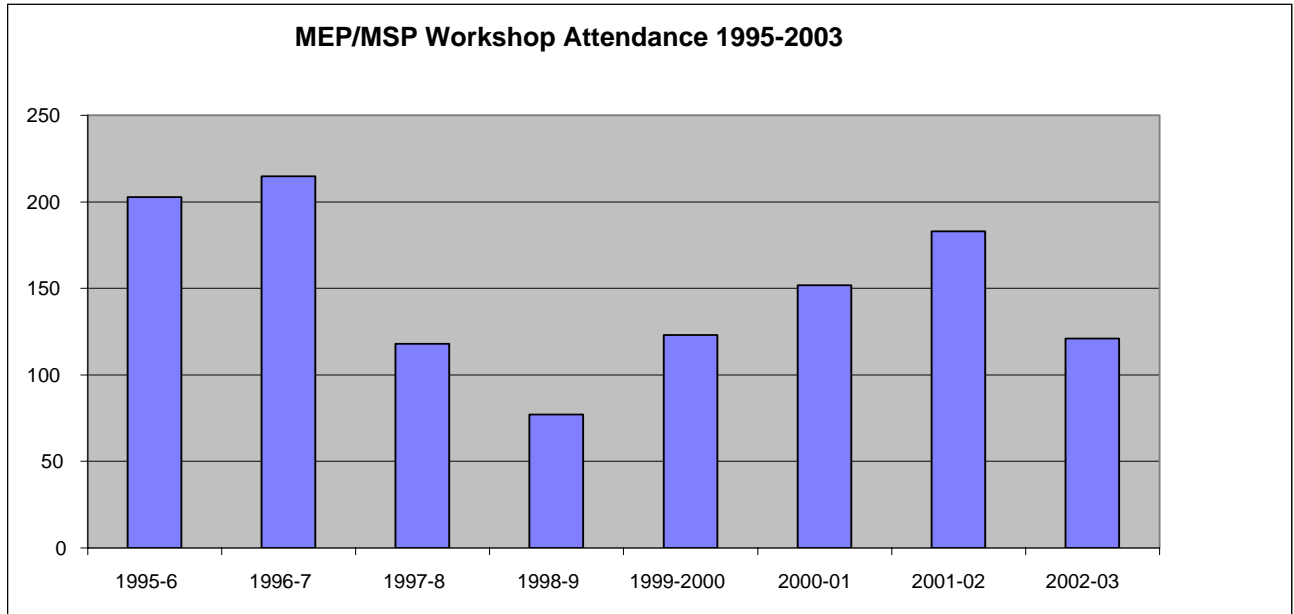
The California MESA Statewide Program received the **2001 Innovations in American Government** Award from the Ford Foundation and the Institute for Government Innovation at Harvard University's John F. Kennedy School of Government. In addition MESA received the **2000 U.S. Presidential Award for Excellence** in Science, Mathematics and Engineering Mentoring from former President Bill Clinton.

Successes and New Initiatives

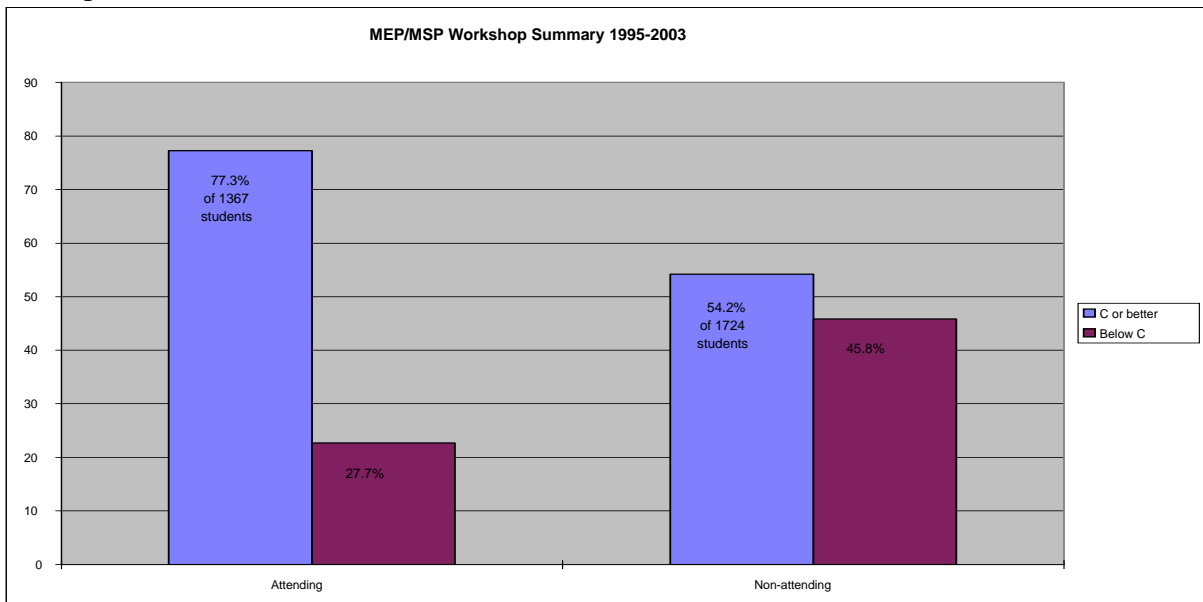
In the last 10 years, the SDSU MEP has successfully graduated over 400 students who have moved on to obtain positions in industry and/or have completed graduate school. Three of these students graduated as the Most Outstanding Student for their college. Many of those graduates continue to support the program in many ways. They either sit on the IAB, volunteer, or donate funds.

Successes

As seen in the graph below, since 1995, over thirteen hundred MEP/MSP students have attended workshops (students may participate in more than one workshop).



The following graph shows that students who attend the workshop are more likely to pass the class (for which workshops are offered) with a C or better than those who do not, proving that workshops are successful.



New Initiatives

The College of Engineering at SDSU provides the core support for two professionals to facilitate the day-to-day operations of the program and to maintain/develop industry relationships to obtain additional funding and support. Donations from MEP alumni and local industry partially cover the operating expenses that MEP no longer receives from the California

MESA Statewide Program since 2004, due to the California budget crisis. Only through local industry donations and alumni support has MEP been able to provide service to students. With additional funding new initiatives include:

- *Increase number of students served:* Two staff members, Retention Coordinator and Program Coordinator would be hired to allow additional students to be served and to support the program with evaluation and administrative duties (these two positions were cut due to withdrawal of funding from the MESA Statewide Office).
- *MESA Saturday Training Academies:* Company sponsored and facilitated training sessions to further prepare students for internships and/or careers. These training sessions will be hands-on skills training and/or developmental training such as time management or communication training.
- *MESA Advantage:* Key internships in industry for those students who successfully work toward completion of MESA Standards.
- *MESA Bridging:* Targeted community college students will benefit from taking advantage of summer cross-over classes prior to transferring to the university. This bridge will assist in their transition to the university, provide them with a skill set desired by industry, allow them to obtain internships at earlier levels, and graduate sooner.
- *MESA Scholars:* To provide students with scholarships and research opportunities with engineering faculty, improving their preparation, ability and desire to enter graduate school.