
Minutes of the Engineering Advisory Council Meeting
NMSU College of Engineering
October 4, 2019
NMSU, Las Cruces, New Mexico

Council Attendees

Chris Long, Chair
Jack Davis, Vice Chair
Richard Leza
Don Quintana
Mark Robertson
Peggy Morse
Eddie Binns
Lou Gomez
Kevin Eades
Mike Beck
Debra Hicks
Wayne Savage
Wencil McClenahan
Ron Seidel
Eloy Torrez
Bud Waters
Carlos Gutierrez

College Personnel

Lakshmi Reddi, Dean
Antonio Garcia, Associate Dean
Phillip DeLeon, Associate Dean
Patricia Sullivan, Associate Dean
Gabe Garcia, Assistant Dean
Mark Gladden, Development Director
Stephanie Armitage Sichler, Development Director
Linda Fresques, College Chief of Staff
Steve Stochaj, Electrical and Computer Engineering
Department Head

Welcome

Council Chair Chris Long called the meeting to order and welcomed council members and guests. Members introduced themselves.

- February 2019 minutes approved.

Action Items

- ⇒ Council members gave unanimous support to the concept of interdisciplinary, cross-departmental specialty programs to meet industry needs. Chris Long will write a letter to the Provost indicating the council's support.
- ⇒ Patricia Sullivan will investigate methods to help students get security clearance prior to graduating.
- ⇒ Linda Fresques will provide members with a private link to the new College of Engineering Fact Book.
- ⇒ Antonio Garcia to present curriculum analytics and data about bottlenecks at the February 2020 meeting.

Dean Lakshmi Reddi

New Mexico State University's College of Engineering is part of a team that received a U.S. Department of Energy five-year, \$100 million grant to create the Energy-Water Desalination Hub to address water security issues. As a member of the National Alliance for Water Innovation team, Pei Xu, the PESCO Endowed Professor and Ward Family Endowed Interdisciplinary Chair in Civil

Engineering, is leading NMSU's effort. The consortium includes Lawrence Berkeley National Laboratory, Oak Ridge National Laboratory, National Renewable Energy Laboratory and National Energy Technology Laboratory along with 19 founding university partners and 10 founding industry partners.

Engineering Advisory Council members expressed much interest in the relationship between the College of Engineering and the Physical Science Laboratory at the February 2019 meeting. While PSL is still independent, strong ties with engineering are growing and the new director, Jim Chavez, is an engineering alum.

The aerospace engineering program is not doing well considering the strong space industry presence in the area. Mechanical and Aerospace Engineering is the college's largest department in terms of enrollment and there has been consideration of separating the two disciplines, but the decision for the time being is to keep them together. There is a very strong candidate with past ties to Sandia National Laboratories for the MAE department head and negotiations are ongoing.

All engineering undergraduate degree programs were reaccredited by ABET this summer. Reviewers noted that NMSU has one of the most student-centered campuses in the nation.

Research productivity is at its highest in the past five years. Research expenditures grew more than 26 percent to \$13.1 million—the highest level since 2014; the number of new awards was up 42 percent and up 52 percent by dollar value. Google Scholar data showed NMSU engineering faculty members published 258 articles in 2018 compared to 112 in 2017. In the period from 2013-2018, engineering faculty publications were cited more than 46,000 times.

Student recruitment and retention is not doing that well. The college has a freshman 1st year retention of 90 percent, however, dropout rates for the sophomore and junior levels are quite high.

The College of Engineering received an anonymous donation for a \$1 million endowed chair. It is the fifth and largest ever chair in the college. The college has had a 40 percent increase in donations and is very grateful to have an engaged family of stakeholders.

The administration is looking at improving course scheduling efficiency and designing the curriculum so that students can navigate several years in advance. The college now has a new data analyst and he is looking at the past 12 years of data for pass and fail rates by course and faculty members. One part-time professor had an 80 percent fail rate for hydraulics and dynamics. Some courses have high fail rates across the board. We can now identify where the problems are and have our mentors provide more assistance in those areas. We can also identify faculty members who should not be teaching.

The college is looking to develop some new cross-disciplinary hybrid program offerings designed to meet employer needs beyond the traditional engineering disciplines. There seems to be a disconnect between programs and industry needs. A different paradigm will map programs with faculty expertise across departmental barriers. These new programs may not require new faculty members. The dean will appoint interdepartmental program heads to develop and lead these new programs.

Provost Carol Parker

Parker thanked council members for their support of the college and for providing vital input to its programs.

Parker stated her strong support for the idea of interdisciplinary programs in the college. She favors a “sub-baccalaureate” that can be indicated on a student’s transcript. Students have been doing this through electives on their own, but they need to have nimbleness in the process and guidance from advisers. This would create flexibility in the engineering program that would not require the cumbersome process needed to develop new four-year degree programs.

Dean Reddi plans to pilot test this concept to be launched by fall of 2020. There is potential in the area of biosystems, which is already underway, led by Catherine Brewer, chemical engineering. She received a salary supplement for leading this program and the state issued a \$200K line item for this program.

There needs to be an entry point for students who need help with the basics, planning and choosing the path is extremely important to persistence so that students avoid wasted time and become discouraged. A pre-engineering program could engage engineering students, similar to pre-med, to help prepare them with the dry subjects (math and physics) to help them succeed before branching off into other programs.

Parker endorses this plan and looks forward to the outcome of a multi-year roll out over the next two or three years at which time we can assess enrollment. She noted that the College of Engineering is foremost in the NMSU strategy for ensuring institutional strength for the future.

Aggie Innovation Shop Tour, Gabe Garcia, Associate Dean of Student Success

Council members toured the Aggie Innovation Shop, which is currently being refurbished. New equipment has been installed, while facility upgrades are being made. The state provided funding to support the upgrade of the equipment, some of which dated back to the 1950s. There is still need for additional funding for needed equipment and facility upgrades.

Physical Science Laboratory Tour, Jim Chavez, Director

Council members toured PSL and learned about its current and planned programs.

Advisory Council Committee Breakout Sessions and Reports

Committee members met and discussed ideas regarding their respective areas. Following are final reports from their discussions.

1. Aerospace Engineering Committee

There is a market demand for spacecraft part design. Perhaps there should be a smaller core curriculum with traditional mechanical courses, i.e., fluid dynamics, etc., for aerospace with more cross-departmental electives to meet these market demands. Space industry employers are looking for electrical and systems engineers. Specialties should be broad.

An issue is for companies to get students with security clearances. It is costly and time consuming. Identification of methods to help students get clearance prior to graduating would be highly useful.

2. Systems and Manufacturing Engineering Committee

The committee members acknowledged the strength of the industrial engineering graduate program but feel a need to strengthen the undergraduate programs. Operations research would be a good focus for graduate students. Areas that could be developed for undergraduate study should include manufacturing engineering, engineering management, advanced manufacturing and systems engineering. The college could leverage faculty expertise and make these interdisciplinary programs as a number of departments could contribute to these programs. It should include the College of Business. Joint appointments would be beneficial to this approach. There is a tremendous demand for qualified employees and research in these areas. The Industrial Engineering Department has been very understaffed for a long time and building it up is a priority for the college.

3. Mentoring Students and Career Advising Committee

This group indicated that the Eloy Torrez Family Engineering Learning Communities is a great place for peer mentoring. They feel that central advising may be useful for first-year students, but after that there should be more involvement by faculty and industry. Dean Reddi and Provost Parker will be discussing the future of central advising. They discussed creative ideas for subsidizing internships for NM Colleges, perhaps using the NSF Step Grant as a model.

4. Seidel Engineering Leadership Institute Committee

Members of this committee met with eight students participating in the first cohort and were very impressed with them. The students were asked for feedback and there was general discussion. The students will be evaluated by education researchers to determine how the program benefits them.