

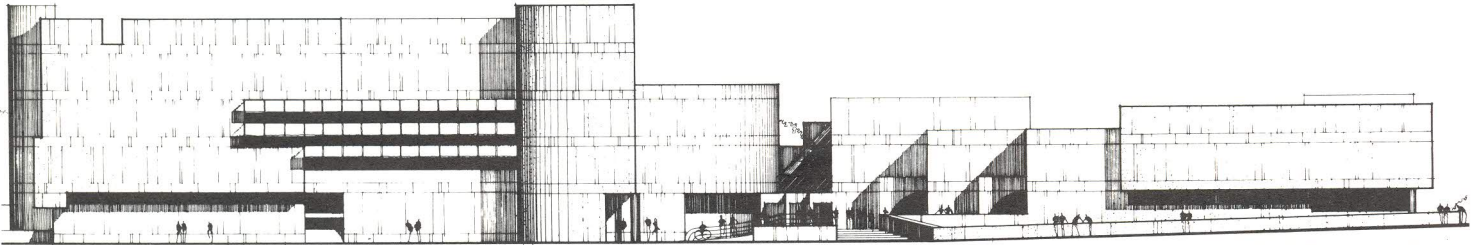


ENGINEERING COLLEGE NEWSLETTER

Winter '82-'83—Vol. 19

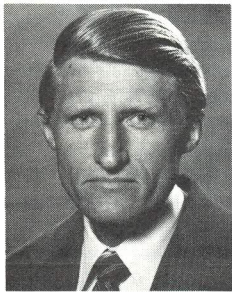
OFFICE OF THE DEAN • COLLEGE OF ENGINEERING • THE UNIVERSITY OF NEW MEXICO • ALBUQUERQUE, NEW MEXICO 87131 • PHONE (505) 277-5521

HOMECOMING OCTOBER 23



Proposed new Engineering Building and Library

Notes from the Dean



Dean Gerald W. May

Each year, this Newsletter goes to all College of Engineering graduates on our mailing list. We intend it to be a way of contacting each of you and keeping you informed of College happenings. In this framework, it is

appropriate for me to reflect again on the fact that our institution derives its strength from people; students, faculty, staff, alumni. There is no other social institution with such a large group of people scattered all over the globe bound together by a shared experience and a professional respect for each other. Our mission of helping people achieve their potential and preparing them to serve their fellow man is a rewarding one.

Among the 2,899 graduates of the University of New Mexico last year were 311 engineers, a much larger percentage than just a few years ago. This statistic is an indication of what is happening in college enrollments throughout the country. Although our final class lists for this fall have not yet been compiled, we believe that we will again see a substantial increase in the number of students in the College, and this will be on top of an overall increase of about 13% last year. The instructional load in the College has doubled in the last six years, and many of our problems are associated with trying to meet that load. The growth of engineering programs across the country is a response not only to market forces but also to a growing realization that technology will play an even more impor-

tant role in society in the future. The quality of our students is excellent. One small indication is that over 35% of the new Presidential scholars this year have declared for engineering.

Each of the departments will report in detail in this Newsletter their progress and problems during the last year. From the overall perspective there are a number of things which are continuing very positively. Special appropriations by the Legislature for engineering and science equipment in

New Mexico have continued to provide us funds for updating and modernizing our laboratories and computing facilities. There is a growing awareness among all levels of state government that if we are to attract high technology industry it must be supported by high quality university educational systems. This is a message that is now reaching the public in a variety of ways, and has resulted in increased visibility and support for the College.

Our facilities are continuing to improve. The new Mechanical Engineering building is great, and those of you who have come to campus recently can attest to the fact that our corner of campus is beginning to look very much better. In spite of a very tight market, we have been successful in hiring some new faculty, and they bring new energy and ideas to the College.

Our highest priority this year is to work for funds for the new Engineering Center, consisting of an Electrical Engineering building and a Science/Engineering Library. Our planning for the building is quite advanced and the architect has already produced a set of plans. Each of the buildings would be bigger than the Farris building and they will be located side by side in the space east of Tapy Hall and the Engineering Annex (old ME building). The new Electrical and Computer Engineering building would bring together that department under one roof for the first time in fifteen years, plus provide space for modernized laboratories and classrooms. The library would contain the engineering and science collections from Zimmerman and place them at a location easily accessible for engineering as well as the science departments. We are all very excited about the prospect of having adequate space for our programs. The building proposal has received top priority from the UNM Regents, and has been presented to the Board

Homecoming Schedule

October 23, 1982

8:30-2:00 p.m. Alumni Office
Registration 2nd floor
Homecoming Union Bldg.

9:30 a.m. ME Atrium
Engineering Alumni Reunion

2:00 p.m. Johnson Gym Field
Homecoming Run

5:00 p.m. Dukes Baseball Stadium
Tamale Fiesta

7:00 p.m. New Mexico State
Game

10:00 p.m. Convention Center
All Alumni Dance

Future Events

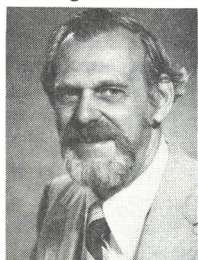
February 21-25, 1983
Engineer's Week

February 25, 1983
UNM College of Engineering
Open House

of Educational Finance. The BEF will recommend to the Governor and Legislature. At that point, we hope that engineering professional societies and our alumni will help support our request. When the money has been appropriated and the buildings built, the vacated space in Tapy will be used for an expanded Engineering Computing Center, the Freshman Program, and possibly the Bureau of Engineering Research.

One of the other needs we see coming up this year is for student financial aid. As you know, financial aid at the national level will be cut back substantially to about half of what it has been a year ago. Such cutbacks affect those who are least able to cope with it. Although the College does administer some funds for scholarships, this amount is not significantly large. Many of you have named scholarships for our engineering students and we greatly appreciate your support.

Finally, and very importantly, we have a new Associate Dean in the College of Engineering. Richard H. Williams, Professor of



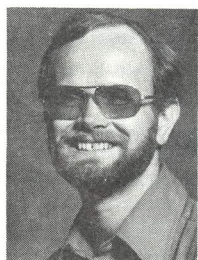
R. H. Williams

Electrical and Computer Engineering, has taken the place of Charles Hawkins who has returned to his department this summer. Dick has been on our faculty for 21 years. He has been the longtime advisor for the Bio-

medical Engineering Option, and was the President of the UNM Faculty Senate last year. We are grateful for Professor Hawkins' two years of service to the College and for Professor Williams' willingness to help assume the administrative load.

I hope you all take time to visit us at Homecoming or stop by for a chat anytime that you are in the city. We enjoy hearing from you and we value your support.

Chemical and Nuclear Engineering (David Woodall—Chairman)



David Woodall

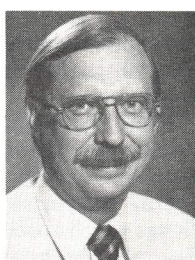
Professors Woodall and Mead continue to serve as Chairman and Associate Chairman of the Department during our on-going search for a senior Chemical Engineering chairperson. We expect to have that new person

on board by January of 1983 or, at the latest, by July. We have had two new faculty members join the Department in the past year, both in the Nuclear Engineering program. Dr. Stanley Humphries, Jr., joined our faculty as a Professor in Jan-

uary with a Ph.D. from the University of California (Berkeley). He had subsequent professional experience as a staff member of Los Alamos Scientific Laboratory, Lawrence Livermore Laboratory and Sandia National Laboratories (most recently). He also had a number of years as a faculty member at Cornell University. His research interests are in applied physics and accelerator science. Dr. Norman F. Roderick joined our faculty as an Associate Professor as of this fall semester. Dr. Roderick received his Ph.D. in Aerospace Engineering from Michigan State in 1971 and his primary areas of research are computational fluid dynamics and magnetoplasma dynamics. Having recently retired as a Lt. Col. in the Air Force at the Air Force Weapons Laboratory, he has prior teaching experience at the Air Force Academy and has been involved in research and project management with the Air Force for a number of years. Full-time faculty members now number fourteen, changing to fifteen in the Spring with the arrival of the new chairperson.



Stanley Humphries



Norman Roderick

During the past academic year the Department awarded 26 B.S., 14 M.S. and 3 Ph.D. Degrees. The undergraduate Nuclear Engineering Option was officially incorporated into the Department beginning with the Fall Semester of 1981. To date, two B. Eng. degrees have been awarded under the program, and the Department expects to award at least five more during the 1982-83 academic year. It is hoped during Spring Semester to change the degree to a B.S. in Nuclear Engineering. The program is growing and should soon reach the desired level of about 15 students per graduating class. Although the number of students participating in our program has been small to date, we have attracted high quality students to our challenging program. This is attested in part by the placement of our first two graduates. In addition, two of our students, Michael Archuleta and John Buska are Presidential scholars and two, David Louie and Steven Hiatt received National Institute of Nuclear Power Operations scholarships. Accreditation will be requested for the Nuclear Engineering Program during the engineering program re-accreditation cycle of the College in 1983-84.

Enrollment in the undergraduate Chemical Engineering program (Sophomore through Senior) reached an all time high of 136 students, of which 70 are at the sopho-

more level. Female enrollment stands at 26%, an indication of the continuing push for parity of women in engineering, nationwide.

A summer research participation program for outstanding high school juniors was implemented this past summer. Under the title of Engineering Aid the students participate in departmental research projects which enable them to have first hand knowledge of such engineering activities. Two juniors were hired for Summer 1982 and the department plans to increase this figure to four in the future. In addition, a Freshman Honors program for Chemical and Nuclear Engineering students will be implemented in the Fall 1982. Funding permitting, students selected for this program will be guaranteed financial aid in the amount of full tuition support.

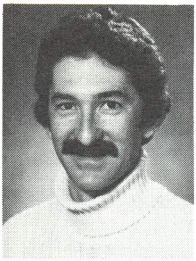
The department once again offered an intensive two-day short course in new recovery techniques for coal and oil shale, tar sands, and "in place" energy recovery technologies. In spite of the airline strike and the slump in the fossil energy recovery economy, there were approximately fifty attendees at the 6th Annual In Situ Energy Recovery Technology Short Course.

The student chapters of A.I.Ch.E. and A.N.S. have been active attending professional meetings, planning picnics, and participating in the Annual Engineering Open House. Three student papers were presented at the AIChE meeting in Salt Lake City and four students attended the National AIChE meeting in New Orleans. Due to the increase in the volume of the available technical books and journals and also the usage of the catalogs of scientific instruments by undergrad and grad students, ANS is working on expanding its library. During the Open House ANS members conducted walk-through tours of the laboratory to more than 400 people.

Two years ago the AIChE student chapter started a scholarship fund, with most of the money coming from an annual solicitation of chemical engineering alumni. The fund has grown to over \$800 and will become an important source of scholarship aid. The first scholarship was awarded this Fall. Expect to hear more about it later this year.

The department has continued to upgrade its teaching and research laboratories with the aid of Bond Issue funds. This year the award to the department was \$150,000. We hope many of you will take the opportunity to come by and see the many changes and additions which have taken place this past year.

Please continue to let us know where you are and what your experiences have been since graduation. Some of our alumni have not been keeping us informed and we really are interested. If you know the whereabouts of any of our lost alumni, we would appreciate hearing from you.



Michael Rodriguez



Paul Evrenidis

tory class on Microelectronic chip fabrication for non-Electrical Engineering students.

Drs. Shyam Gurbaxani, Delores Etter, and John Brayer all received promotions this year. Drs. Gurbaxani and Brayer are currently on sabbatical leave doing research in the Albuquerque area in Electromagnetics and Pattern Recognition, respectively. Professor Harold Knudsen was recognized by the College Alumni by being selected as the outstanding college teacher of the year. Dr. Knudsen received strong support for this award from his students in his Microprocessor Laboratory.

Professor Mohammad Jamshidi has completed his first year as Editor of the IEEE Control Systems Magazine and Professor Shlomo Karni has been appointed Editor of the IEEE Circuits and Systems Magazine. Dr. Peter Dorato will be technical program chairman for the 1983 Automatic Control Conference which will be held in San Francisco, June 22-24, 1983.

A new graduate Electronics Laboratory, to support EECE 526L, is being developed by Professor Chuck Hawkins. The laboratory will be offered for the first time spring 1983. It will include projects with 16 bit microprocessors and advanced electronic experiments.

A very polished edition of our departmental newsletter was mailed to many alumni this year. The newsletter is edited by Dr. Karni. If you would like to receive a copy please contact Dr. Karni.

Mechanical Engineering (Alan Lebeck—Chairman)



Alan Lebeck

Enrollment in Mechanical Engineering continues to grow. This past year an average of 327 undergraduate and graduate students were pursuing degrees in Mechanical Engineering, up 12% from last year. While the number of graduate students remained about the same, the number of graduate students pursuing the Ph.D. increased dramatically, a trend which is most promising. The number of degrees decreased this year,

but with the high enrollments, this reduction is expected to reverse next year.

Our introductory Mechanical Engineering course, M.E. 201, has changed this year. The course now focuses on introducing mechanical engineering concepts and includes numerous laboratory experiences, including disassembly and reassembly of an automobile engine. Other experimental subjects include fluid flow, solar heating, robotics and materials testing.

Thirty eight Mechanical Engineering students received scholarships totaling over \$10,000 this year. These scholarship funds were donated by industry, various professional organizations and alumni. The donors of these much needed funds cannot be thanked enough.

Our ASME Student Chapter was very active this year. In addition to creating a lot of enthusiasm, organizing Open House, and inviting speakers, the ASME students organized and hosted the Region VIII Regional Student Conference and Paper Contest.

During the past year, the laboratory content of the Mechanical Engineering curriculum was studied. The faculty approved the addition of a third laboratory course. This course will be used to strengthen laboratory exposure in the areas of metallurgy, mechanics, and manufacturing.

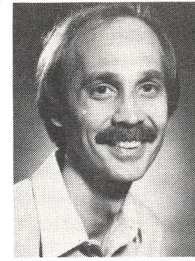
Using the second year appropriation of bond money, many new items of equipment were purchased for the labs. The new equipment includes minicomputers, a tensile test machine, metrology equipment, strain indicators, a miniature robotics arm, a six axis force sensor, an engine lathe and cutting force dynamometer, and numerous smaller items for the labs. Computer use by the department was higher than last year. To encourage this trend, several computer terminals for student use were purchased and located in a room now open during the day.

Several more terminals were purchased and placed in faculty offices in recognition of the importance of the tool. Through a generous donation from Bud Gunderson (ME 1944), two Apple Computer Systems were purchased for student and faculty use. We are purchasing and writing design programs for use on these systems.

After several years in industry and various laboratories, Howard (Buck) Schreyer rejoined the faculty in January. Professor Schreyer will be developing courses and research in solid mechanics. Bob Grassberger joined us as a visiting lecturer in January. He will be teaching laboratories, fluids, thermodynamics and freshman courses. Jim Leith joined our faculty this fall to strengthen our capabilities in the fluids and heat transfer laboratories. Professor Leith completed his studies and taught engineering at the University of Texas, Arlington. We are very glad to have these additional faculty to help us teach and develop programs. Greg Starr was promoted to Asso-



Bob Grassberger



Jim Leith

ciate Professor effective this year. David Chou was tenured this year. We congratulate both faculty members for their success.

The Department hosted twenty two seminars this year, thirteen from the applied mechanics group and nine of general interest. Presentations were made by professionals, faculty, faculty candidates, and students.

Several research programs continue to be active and provide support for graduate students. Professor Chou continues work on turbulent inlet flow supported by NASA. Professor Ju has continued his work in investigating heat checking under an Office of Naval Research contract and structural damage under an Air Force Office of Scientific Research contract. Professor Wildin has just obtained a major contract with the Electric Power Research Institute to study thermal storage using the M.E. building facilities. Professor Klamecki received his first contract from ONR to study the role of Entropy theory in wear processes. Professor Lebeck continued to develop new seal concepts under a contract with the Office of Naval Research. Professor Starr completed his work on robotics supported by NSF and now has funding from Sandia to continue his work.

Several new courses have been given approval for development. Microprocessors in Mechanical Engineering will be taught next spring. Applications of finite element methods is being taught this fall. This elective course is designed to give the undergraduate student the much needed experience with finite element computations. A second undergraduate solar course, M.E. 426, "Solar Thermal Energy System Design" was added. The original course, M.E. 425, has now been changed to a solar components design course.

Biomedical Engineering (Charles F. Hawkins, Advisor)

Professor Hawkins has accepted the position of Biomedical Engineering Advisor. Professor Williams has assumed the Associate Dean position and Professor Wilkins is devoting her full efforts to teaching and research.

Good students with a strong personal motivation to combine an engineering discipline with a career in the life sciences are

encouraged to consider the Biomedical Engineering Option. Students in this option frequently continue their education after graduation by entering Medical School or by engineering studies at the graduate level. Graduates of Biomedical Engineering find employment in companies or agencies as part of an interdisciplinary team that applies engineering to the health field, in such areas as medical instrumentation, renal dialysis units, and clinically applied instrumentation.

Biomedical Engineering students receive a strong background in chemistry and biology. Typically they select an engineering discipline such as electrical, chemical, or computers to achieve some professional expertise. They also take two specific upper-class engineering courses that emphasize biomedical instrumentation topics and modern techniques for modeling physiological systems. Thirty-three students were enrolled in this option in the College at the sophomore level and above. Graduate students at UNM with a Biomedical Engineering interest normally enter Electrical and Computer Engineering or Chemical/Nuclear Engineering, where they can satisfy the specific departmental graduate requirements, while pursuing their biomedical interests by their choice of electives.

The Biomedical Engineering research by the faculty is quite active. Professor Wilkins has an ongoing project to develop an implantable glucose sensor. The work is related to the implantable insulin pump project jointly conducted by the UNM Medical School and the Sandia Corporation. Professor Williams is active in the study of signal properties of visual evoked potentials. This work is done in collaboration with the VA hospital in Albuquerque. Professor Hawkins has two projects that relate to communicative disorders. He is working with Ph.D. student Bill Shurtleff to develop a quantitative technique to measure the motion of the side of the throat. The work is directed toward cleft palate children. A second project seeks to improve current techniques to measure hearing loss in newborn children. Graduate students Pat Duy and Janie Paige have helped develop a hear-rate response technique that has been conducted with the Phoenix Indian Medical Center in Arizona.

Energy and Power Systems Options

(Martin Bradshaw—Advisor)

The number of students entering the Option appears to be on the increase. Many of the new students who have recently been admitted into the Option are transfer students who want to utilize as many of their transfer credits as possible. The Option Committee still consists of Professors M.

Bradshaw (EECE), M. El-Genk (NE), and B. Wildin (ME), but the Option Advisor position has changed from Professor Wildin to Professor Bradshaw.

There have been no significant program changes since the last edition of the newsletter, but with a new University catalog in the rough draft stage, the Option Committee has been meeting to completely review the entire program. While the number of alumni from E&PS is not large, we members of the Option Committee would like to hear from each of you, telling where you are and your work experience, etc. A common question of students contemplating this option is "Where do the graduates of E&PS work?" and we would like to pass on your experiences.

Microelectronics Processing Option

(Roy Colclaser—Advisor)

Professor Roy A. Colclaser, Department of Electrical Engineering is the Advisor for the Microelectronics Processing Option. UNM College of Engineering developed this new option under the Bachelor of Engineering program in response to requests from industry. A donation of \$1,000 has been received from IBM Corporation to help this program. Graduates of this option will be prepared to enter the microelectronics industry in positions of process development and process sustaining engineering. These jobs require a significant understanding of both chemistry and electrical engineering. The nationwide demand for microelectronics processing engineers is projected to be on the order of 500 to 600 per year over the next five years. There are approximately 12 students at various levels in the College of Engineering's program. It is possible that May 1982 will see the first graduate in Microelectronics Processing, but certainly there will be graduates in the program by May 1983.

Student Advisement Center

(Mary Ann Kelley—Student Advisor)

(Diane Kelly—Student Records)



Mary Ann Kelley

basis. As a support to both of these ser-

The growth of the College of Engineering is keeping the College Advisement Center busy. Mary Ann Kelley, Student advisor, and Diane Kelly, Student records, talk to anywhere from 15 to 75 students on a daily

vices, Rita O'Rourke, secretary, answers countless questions for another 20 to 50 students per day concerning university, college, advisement, scholarship, and records procedures. In addition to acting as a student support center, the Student Advisement Center is kept busy supporting special projects such as recruitment, Open House, Homecoming, and Graduation.

Special Programs **(Tom Cummings—Director)**

Special Programs works with parents, students, counselors, teachers and administrators to identify minority high school students who have the ability to succeed in engineering at UNM. We try to provide the motivation to pursue an engineering education and an awareness of career possibilities in various fields of engineering. Summer programs introduce 150 minority high school students to campus life, to the individual engineering departments, and to college classes and labs.

Intensive tutoring and counseling programs attempt to reduce the high rate of attrition among minority students. A faculty advisory committee, one member from each department, works with the program to set goals and devise effective strategies to meet these goals. This committee consists of: Drs. D. A. Neamen, E. Gilbert, Ebtisam Wilkins, B. Gross, and B. Thomson.

The program relies mainly on corporate contributions. In 1981-82 we received \$150,923 from 29 corporations. Federal support included: NASA—\$13,999; U.S. Air Force—Research Apprenticeships: \$57,000; UNITE: \$21,125.

In 1982-83 the staff plans to identify all students in the College in need of special support, increase the effectiveness of our high school contacts to recruit qualified minority students into the College, and increase corporate support of these efforts to recruit and retain minority students.

Hispanic Engineering Program

(Peggy Maestas—Director)

The HEP program serves in a supportive capacity for all Hispanic engineering students. Its emphasis is recruitment and retention. Recruitment efforts include contact with high school students, counselors, teachers, and administrators; utilizing all possible resources—community and professional organizations, alumni, faculty, etc. Retention involves academic advisement, counseling, free tutoring, and locating scholarships.

Summer programs include: 1) PRE-FACE—a one week orientation program