

Outlook bright

Engineering marks 75

Dean Fred J. Burgess is "bullish" on the future of the Oregon State University School of Engineering, which is marking its 75th anniversary this year.

The outlook is bright but coming changes will be big ones, says the engineering dean.

"I see the Oregon State University School of Engineering remaining in Corvallis and staying in the ranks of the top engineering centers in the country though that will be a challenge with the current money problems. The legacy of the past century gives us a base on which to build for the future. I'm convinced we will be contributing even more to the state and nation in the 21st Century than we have in the 20th," Burgess said.

However, we do not have an exclusive license or lock on engineering in Oregon, it must be remembered. In the future, there'll be more competitiveness but also more cooperation between institutions and between universities and industry, he emphasized. Some innovative programs must be developed to better serve the people of the state and nation.

The University of Portland, a private institution, has granted engineering degrees since 1947. And Portland State has offered engineering since 1972, he noted.

Burgess believes 'talent' will be the limiting factor in the future of engineering. "Finding and developing the really outstanding and talented persons around whom programs can be built will be the key," says Burgess.

"If Oregon is going to diversify its economic base and be attractive to new businesses and industries as well as its traditional industries of agriculture and forestry, we're going to have to make some moves in different directions.

"One of the real challenges that I see is how do you put away rivalries of the past between our universities and develop real coordinated, cooperative programs that serve new industries and the people of Oregon by using and pooling the talents that exist in the various institutions and in industry.

"We'll all be playing a different kind of ballgame in the future. OSU has to continue to maintain its leadership and place on the national scene, but we're going to have to be much more involved in cooperative programs with the talented persons at other universities and in industry. University people have to accept the fact that we're not the fountain of all knowledge. There are people in industry that are every bit as talented and accomplished."

Burgess is excited, for example, over OSU preliminary plans for an off-campus Ph.D. degree program at Tektronix, Beaverton. It breaks graduate school tradition but it makes sense in terms of future needs and opportunities, he emphasized.

Burgess thinks Oregon can compete in the national "high tech" market "if we can get our act together." Oregon is too small a place for two or three universities or areas to start squabbling over resources that indeed are going to be scarce for the rest of this century.

To share talent and cut costs at the same time, Burgess envisions having the various engineering schools in the state — or area — linked by two-way telecommunications systems.

"That way, for example, our Dr. John Owens (an expert on semiconducting compounds and devices used in the electronics industry) could lecture to classes on other campuses as well as ours and to interested people in industry as well. Listeners could ask questions and be called upon by name just like they are in a classroom even though they were 60 or 90 miles away from the actual lecture room.

"The development of areas of excellence in engineering will be vital, too," says Burgess. "It simply isn't possible to have outstanding programs in every field."

OSU, for instance, is embarked on becoming a national center for research in three-five compounds for growing new types of crystals for use in electronics industry, including computers. Three-five compound crystals have many advantages over common silicon chips that are used today. For one thing, electrons move 5 to 30 times faster in these materials, says Burgess.

"Excellence breeds excellence," he continued, pointing to OSU's recent hiring of a world authority on "molecular beam epitaxy" — the new technique for growing the advanced electronics crystals-chips. Dr. John Arthur was hired away from Perkin-Elmer, a large electronics instrument company where he served as Director of Research. This year, he has been chosen for two prestigious national awards for his pioneering discoveries in electronic materials. Arthur's appointment was made possible by the establishment of a special chair (professorship) in electrical and computer engineering by Tektronix, the Beaverton high tech-based company that is Oregon's largest employer.

"This is the wave of the future," says Burgess — the cooperation of universities and industries to the benefit of both. And world renowned teachers and researchers are needed for an institution to make its mark on the national and international scene.

"Electronics (high tech) industries are very anxious to establish ties with top engineering schools and research centers," Burgess noted. "The traditional industries are not that excited about it at the moment but I believe they will soon become aware of the potential returns from supporting university research projects and entering into cooperative education agreements with universities. Under cooperative education programs, students spend a term or two of their college years as on-the-job interns in industry, receiving both academic credit and often pay as well.

The scarcity of resources will make it necessary for OSU to continue enrollment controls in engineering, according to Burgess. "In the high demand areas, we have about 40 percent more students wanting to get into our programs than we can teach in a quality way. No, I do not foresee reductions in admission limitations or enrollment controls.

"Jobs for graduates are not in short supply thankfully, but students must search harder and farther than in the past, according to Burgess. Highest demand areas are electrical and computer engineering, chemical, civil and mechanical engineering.

About 40 percent of OSU's engineering graduates work in Oregon and 45 percent work in nearby states in industries that are intertwined with Oregon's economy.

With an enrollment of 3,300 students (12 percent of them women), the School of Engineering ranks in the top 15 percent of the nation's engineering schools, Burgess reported. "Recent budgetary problems have forced the school to limit enrollment in order to protect the quality of its programs, however," he added, "and this numerical standing could soon suffer."

In numbers of undergraduate students, OSU ranks 26th among the 290 U.S. engineering schools. In graduate student numbers (300), it is in the top 40 percent nationally and the size of its research program puts it in the top 40 percent also.

Although the Engineering Experiment Station does not receive funding from the state budget, research activities in 1982 involved more than 80 projects supported by grant and contract funds of about \$3,800,000 from outside agencies and industries. Several of the research activities involved use of the school's O.H. Hinsdale Wave Research Laboratory. This unique 110-meter long wave basin is the largest and best equipped wave facility in the U.S. and serves as a center for wave research involving coastal and offshore structures. The facility was built entirely with privately-donated funds.

To help with the economic development, the School has offered part-time, off-campus graduate study and continuing education courses for Portland-area engineers since 1960. The programs have helped stimulate the development of high-technology industries.

About 800 engineers have participated in these programs and 37 degrees have been awarded. More than 200 engineers from the electronics industry are currently enrolled in the Cooperative Program offered at Tektronix, Burgess noted.



AVERAGE SALARY FOR GRADUATES ABOUT \$24,000

Average starting salaries for June 1983 OSU engineering graduates will be up just slightly (to about \$24,000) from last year (\$23,568), says Fred J. Burgess, dean of engineering.

"The range of starting salaries is likely to be somewhat greater than last year's \$18,500 to \$28,000," Burgess added. "It appears that there will be more offers below the bottom end of 1982 and more above the upper end as well.

"This year, job numbers and engineering graduates will match pretty closely but in some areas of engineering, graduates are going to have to search diligently to find what they want," Burgess continued.

"However, the outlook is still better for engineering graduates than those coming from other academic areas." Highest demand areas are electrical and computer engineering, chemical, civil and mechanical engineering.

The signs continue to be positive for OSU engineering graduates, Burgess emphasized. "They are sought on a steady basis by industry and in somewhat greater numbers this year by governmental agencies, which see serious shortages of engineers down the road. One of the factors is the on-going retirement of the World War II veterans who swelled engineering numbers so dramatically in the late 1940's and 1950's." Burgess, 57, was one of them and now is looking at retirement himself in 5 to 8 years.

The United States and the world are not going to retreat from a technological base, Burgess is convinced. "Engineers and scientists will continue to be needed in great numbers to serve society and solve its living, transportation, manufacturing and environmental problems in the century ahead."

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