

As Students Flock to Computer-Science Courses, Colleges Scramble to Find Professors

Enrollments rise by 20 pct. a year at some institutions, while industry lures graduates with hefty salaries

By JACK MARGARRELL

With college enrollments leveling off, budgets getting tighter, and graduates searching for jobs, computer science seems to be having more success than it can handle:

► The demand for computer scientists is 40 percent greater than the supply according to one estimate.

► Enrollment in computer-science courses is rising rapidly—by 20 percent or more per year at some institutions.

► Recruiters from industry are grabbing up graduates with salary offers that have risen by nearly 40 percent in the past three years.

► A shortage of faculty members in the field has caused universities to scramble for temporary and part-time teachers.

At the University of Oregon, enrollment in computer-science courses is up 34 percent over a year ago.

"Students are flooding into computing," says Stephen T. Hedetniemi, head of Oregon's department of computing and information sciences.

In computer-science departments across the country, he says, "as much as one-third of the staff are temporary or part-timers; it's the only way we can deal with it."

Mr. Hedetniemi says his department has seven regular, full-time faculty members and five staff members hired on a part-time or temporary basis.

To get teachers, he has been looking for nonacademic people—consultants or employees in private industry—who have Ph.D.s in computer science and might be willing to teach a class.

Bigger Salary, No Teaching

One computer scientist on the Oregon faculty, P. S. P. Wang, left last month to take a research job with General Telephone and Electronics Corporation at nearly twice the salary he received as an assistant professor.

Besides leaving Oregon with a faculty vacancy slot that is difficult to fill, Mr. Wang is asking approval of the National Science Foundation to take with him the \$22,000 balance of a \$30,000 research grant he received while at the university.

Mr. Wang, 34, says his job at the GTE laboratory in Waltham, Mass., will allow him to "maximize my time and effort for research." During the fall quarter at Oregon, Mr. Wang taught two classes, each of which met for six hours a week for four hours' credit. One of the classes had 120 students.

"The student population has increased and the faculty has decreased," he says. "The burden was tremendous."

Mr. Wang says he also received job offers from International Business Machines Corporation, International Telephone and Telegraph Corporation, Texas A&M University, and the University of British Columbia.

"It's an impossibility to fill faculty positions," says A. Joseph Turner, head of the computer science department at Clemson University.

He says he has to compete with other universities, as well as industry—but the industrial competition is by far the toughest.

"There seems to be a slight increase in the number of Ph.D. graduates coming out this year," he says, "but more of them than ever before are leaning toward industry."

Mr. Turner says he talks to graduates in computer science who say they are interested in academic jobs, but they often change their minds and accept higher-paying jobs in industry. There no use even trying to attract the graduates who list themselves as looking for jobs in industry, he says.

"The Funds Aren't There"

In seeking more money to expand their programs and compete with industrial salaries, Mr. Turner says, computer-science departments run into stringent budget limits—set either by the university or the state—that were based on an earlier expectation of little or no growth.

"We're in a period of rapid growth and the funds aren't there," Mr. Turner says.

Enrollment in computer-science courses at Clemson has been increasing by about 20 percent a year, he says. Enrollment rose about 50 percent this year because of a change in the business-school curriculum that caused both freshman and sophomores to take a required course in the same year.

Some 200 Clemson students chose to major in computer science this year, the first in which the university offered bachelor's and master's degrees in the field, Mr. Turner says, and 100 freshmen have been accepted as computer-science majors for next fall.

"Before it's over, we may be one of the two or three largest majors on campus," he says.

At the University of Illinois at Urbana, the number of company recruiters looking for graduates in computer science increased from 35 in 1971-72 to 60 in 1975-76 and 196 in 1979-80, according to David R. Opperman, placement director for the college of engineering.

The College Placement Council reports that the average monthly salary offered to new graduates with bachelor's degrees in computer science rose from \$915 in 1974 to \$1,123 in 1977 and \$1,558 in 1980. That's an increase of 70 percent in six years.

Employment to Double by 1990

Computer science will be the major field of study for a growing share of graduates during the 1980s, according to N.C.E.S. projections. In 1970, only two in every thousand bachelor's degrees were in computer science. That share rose to eight per thousand last year. By 1988, it will be 11 out of every thousand, according to the education statistics center.

The Bureau of Labor Statistics, in employment projections scheduled for publication this spring, estimates that employment of computer specialists will more than double between 1978 and 1990.

In that period, says Patrick Wash of the bureau's occupational-outlook division, jobs for systems analysts are expected to increase by 120 percent to 400,000; for programmers, by 102 percent to 500,000; for computer operators, by 116 percent to 850,000; and for computer service technicians, by 154 percent to 160,000.

One consulting organization has estimated that the number of computer programmers hired by employers rose by 51 percent in 1979. Comparing 1979 hiring with the previous year, the hiring of systems programmers—those with broader responsibilities than computer programmers—was up by 35 percent and of systems analysts—who plan and direct the work of systems programmers and computer programmers—by 29 percent.

Demand Up 28 Pct. This Year

The demand for professional workers in the computer field will increase by more than 25

percent this year, according to a survey by another consulting organization.

John W. Hamblen, chairman of the computer-science department at the University of Missouri at Rolla, estimates that in 1978 American Colleges and universities were turning out only about one-sixth of the number needed at the bachelor's degree level, less than one-tenth of the number needed at the master's degree level, and less than one-third of those needed at the doctoral level.

California was the only state producing more Ph.D.s in computer science than it needed, Mr. Hamblen says, adding that Illinois produced 85 percent of the Ph.D.s it needed, followed by Maryland with 73 percent, and Iowa with 61 percent.

"No state is even close to producing its need" at the bachelor's- and master's-degree levels, he says.

Two-year colleges and vocational schools in some states were producing more computer specialists than were needed, but problems of oversupply at that level were avoided because of "the severe shortage at the four-year level," Mr. Hamblin says.

A Massachusetts-based company, Wang Laboratories, has attempted to ease the problem of finding specialists in software engineering by setting up a new graduate school just for that purpose.

The Wang Institute of Graduate Studies, located in Tyngsboro, Mass., was established as an independent, nonprofit graduate school with a \$3-million gift from the family of An Wang, president of Wang Laboratories. The first classes in a program leading to a master's degree in software engineering began last month.

NSF Study

The National Science Foundation's latest national survey of science and engineering personnel found that between 1976 and 1978 employment of computer specialists rose by 30 percent. The only other science category in which employment increased during that two-year period, according to the study, was environmental science, with a growth of 20 percent.

The study also found that:

- Four out of five computer specialists found jobs closely related to their degrees, compared with only about one out of seven for graduates in mathematics and the social sciences.

- Employment of computer specialists in colleges and universities increased by more than 25

percent between 1976 and 1978. The number of bachelor's degrees granted in computer science also increased by more than 25 percent in that period.

► The number of computer specialists in the U.S. grew by 3.7 percent between 1974 and 1976; in the following two years, it grew at nearly 10 times that rate.

► The 234,000 computer specialists employed in 1978 included 40,600 women. Only 600

computer specialists—100 of them women—were unemployed in 1978, according to the N.S.F. report.

► Of the employed computer specialists in 1978, only 17,900 were in academic posts, compared with 173,000 in business and industry, 14,600 in the federal government, and 28,800 working for various other kinds of employers.

► The number of employed computer specialists with doctoral degrees more than doubled between 1973 and 1977—from 2,692 to 5,767.