

Technology Course For Non-Engineers Attracts Students

The College of Engineering has introduced a new undergraduate, three-credit course, "Impact of Technology," aimed at increasing the technological awareness of non-engineering students at KSU.

When offered this past fall, enrollment for the course was limited to 30. Interest has been so strong that two sections are being offered spring semester for 60 persons. Both sections were filled quickly.

This fall the course was taught by Dr. Wilson Tripp, professor, and Dr. Robert L. Gorton, associate professor, both of the department of mechanical engineering. Each will teach his own section this spring due to the increased student interest.

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ENGIN-DEAR COOKBOOK—The KSU Engin-Dears, coed auxiliary of the College of Engineering, have compiled and published a new cookbook featuring desserts, salads, breads, and punch mixes. Cost: \$1.50 (includes 25c handling). To obtain your copy, send your inquiry to: Engin-Deard Cookbook, Office of Dean of Engineering, KSU, Seaton Hall, Manhattan, Kan. 66502. Dean Ralph G. Nevins purchased the first one from Engin-Deard Susan Falk of Topeka.

Open House Set

March 14-20, 1971.

Engineers' Open House Week in Kansas.

Wednesday, March 17 (St. Patrick's Day).

12:30 p.m., Crowning of 1971 K-State Open House Royalty, St. Patrick and St. Patricia (Front Steps of Seaton Hall).

Friday, March 19.

9 a.m. to 4 p.m., Meeting, Engineering Advisory Council (K-State Union).

5 p.m., Opening Ribbon-Cutting Ceremonies (Front Steps of Seaton Hall).

5 to 9 p.m., Exhibits on Display Engineers' Open House.

Saturday, March 20.

8:30 to 11 a.m., Third Annual Engineering Alumni Symposium (K-State Union).

9 a.m. to 5 p.m., Exhibits on Display, Engineers' Open House.

12 Noon, Luncheon for Participants in Symposium and Open House (\$1.70, K-State Union).

5:45 p.m., Engineering Open House Awards Banquet (\$3.50, K-State Union).

Prestige of Engineering Honors Program Is Drawing Card to High School Seniors

To a bright high school senior trying to decide the university or college to attend, selection for an honors program will often influence his choice.

This was partly true for William H. Miller, Wichita, a KSU graduate student in nuclear engineering.

When Miller was graduated from North High School five years ago, he had already made up his mind to enroll in K-State's nuclear engineering curriculum.

Although he considered other engineering schools, what made his decision easy was his selection to the K-State engineering honors program. Like many high school seniors, Miller felt there was prestige involved in being named.

During his freshman year at KSU, he took honors section courses in English and history. He participated in honors colloquia and seminars the next three years.

Now a little over five years have passed. After graduating from the program last January, he really thinks there was little difference between regular engineering curriculum and the honors program.

On the other hand, he felt it was helpful to participate in seminars, do a special research project, and take honors section courses.

In the seminars, Miller found discussions particularly helpful. These were on topics like environment, social implications of technology and the multi-disciplinary approach.

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Dr. Rey, Swiss Ergonomist, Continues Research Activities Started at K-State

Dr. Paule Y. Rey, an assistant professor at the University of Geneva, Switzerland, who is also an industrial consultant in human factors studies, served as a visiting professor in the KSU department of industrial engineering first semester.

Although she returned home Dec. 12, she is continuing glare and illumination research activities initiated while at K-State.

Dr. Rey has been at the University of Geneva since 1963, working in physiological and work environmental studies. She teaches physiology, occupational medicine, and human factors to medical students.

At K-State, she taught a course with Dr. Corwin A. Bennett and Dr. Stephan A. Konz. She presented several lectures on basic physiology for engineers, and also taught a course in ergonomics, the study of fitting the job to the man.

In her lectures, she discussed engineering approaches to topics such as occupational health and how to prevent accidents and diseases.

Dr. Rey, before becoming an ergonomist, had planned to be a practicing physician. "But I didn't like the practice," she said.

She started working in a hospital and "was not happy. So I looked for other ways" to work. So she went to Harvard's School of Public Health.

While at Harvard, "I became interested in human factors. I went home and worked as a consultant in watch factories," she said.

As a consultant, she handled questions and problems on job analysis, improvement of work status, and reasons for absenteeism.

Dr. Rey then returned to her alma mater, University of Geneva. She accepted a position in the Institute of Physiology where she developed a human factors laboratory.

At the institute, she has conducted research and served as a consultant. Her research has dealt with the effect of flickering lights on the eye and vision. Her goal: an improved method of measuring mental fatigue.

She has also done considerable consultant work for factories, "especially with noise factors, illumination, work places, and absenteeism. I might be a consultant on any problem related to human factors. I was working with a team of industrial physicians and toxicologists so we could look at human factors from different points of view," she said.

Miss Rey earned her M.D. in 1953 at Geneva, her M.S. at Harvard in 1955, and Ph.D. at Geneva in 1965, specializing in ergonomics.

For relaxation, Miss Rey plays classical piano. She says that she tries to practice at least an hour or two a day. But she doesn't always have time for that.

"I'm trying to improve my technique. I pick up music to play from several different composers," she said.

She is a skier but admits readily that she's not "very sport-minded. I'm more interested in the arts."

College Successful On 56% of Proposals To Funding Agencies

A total of \$147,309 in research contracts and grants has been awarded to K-State through the Engineering Experiment Station since July 1, 1970, Prof. Dwight A. Nesmith, EES director, has announced.

The total includes a \$33,217 contract awarded to Dr. Benjamin G. Kyle, professor of chemical engineering, by the U.S. Public Health Service. The study is entitled "Odor Removal from Air by Adsorption on Charcoal."

Prof. Nesmith indicated that the College of Engineering has received awards on 56 per cent of the proposals submitted and obtained grants amounting to 54.5 per cent of the total dollar amounts requested.

From Jan. 1, 1969, to Sept. 30, 1970, EES processed a total of \$2.63 million in proposals. More than \$1.31 million in grants and contracts were awarded from these proposals, Nesmith indicated.

At present, there is a total of \$11,700 in research dollars for each full-time KSU engineering faculty member.

Additional new contracts since July 1:

-Dr. L. T. Fan, professor and head of chemical engineering, "Development of Water Quality Models Using Spectral Analysis Parameter Estimation Techniques," Kansas Water Resources Research Institute.

-Dr. Frank A. Tillman, professor and head of industrial engineering, "Multi-Area Transport Routing Optimization, U.S. Post Office.

-Vernon P. Deines, professor of architecture, "Public Investment Plan for Kansas Portion of Ozarks Regional Development," Kansas Department of Economic Development.

-Dr. Tillman, "Optimal Control of Pollution Distribution," Public Health Service.

-Dr. Michael S. P. Lucas, professor of electrical engineering, "Tube Furnace Controller," Motorola.

-Dr. Gary L. Johnson, assistant professor of electrical engineering, "Engineering Evaluation of Techniques for Measuring Moisture Content of Grain," Agricultural Research Service.

One contract has been renewed.

-Dr. Lucas, "Applications of Integrated Circuits in Agricultural Machinery," Allied Farm Equipment.

Individual Teaching Techniques Utilized In Four Departments

Utilization of individualized instruction techniques has increased markedly during the past few months among KSU College of Engineering faculty members.

Three in mechanical engineering—Dr. Clyde H. Sprague, Rodney T. Nash and Alley H. Duncan—have been employing these teaching techniques since June, 1969.

In electrical engineering, Dr. Donald H. Lenhart is using the technique spring semester in his circuit theory course taught in the standard lecture-recitation format in the past. Dr. Gary L. Johnson will use it in his Electromagnetic Theory I course this spring.

Some nuclear engineering faculty are also "highly sold" on this new method of instruction. It is being used in an introductory materials course team taught by Dr. Walter Meyer, Dr. Frederick Merklin and Dr. N. Dean Eckhoff. Eckhoff is also using the technique in his spring semester course in neutron activation analysis.

Dr. Stanley J. Clark of agricultural engineering is using individualized instruction in the laboratory portion of his tractors class this term.

Some 83 mechanical engineering students have been exposed to the technique in Mechanical Engineering Laboratory I taught by Sprague, Nash and Duncan.

Sprague and Nash have conducted their own student evaluation of the course each semester. They don't use the evaluation form employed in most classes because it applies primarily to standard teaching techniques.

In three semesters, they have found that the technique helps all students, particularly slower ones. "They can work harder, put in more time, receive more individualized instruction, and thereby earn an A in the course.

"Virtually all our students indicated that some of the instructional units were so interesting that they did more work than was required. Student opinion indicates there is a general tendency for stimulation of new ideas as a result of the individualized instruction received. We don't know why this occurs. But it does," Sprague said.



C. H. Sprague



R. T. Nash

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Ward Hall Addition Construction Work Right on Schedule

Construction for the new \$1 million addition to Ward Hall at KSU "is right on schedule." The added facilities are scheduled for occupancy next autumn.

The existing Ward Hall facilities, housing part of the K-State department of nuclear engineering, include the Triga Mark II teaching-research reactor and laboratories.

The classrooms, laboratories and offices of the department will be centralized for the first time when the addition is completed. These are currently divided between Ward Hall and Seaton Hall.

Although the addition is being built primarily for graduate training, it will also be used extensively for undergraduate instruction, particularly for experimental courses.

More specifically, the addition will enable strengthening of undergraduate teaching by adding a study option in nuclear fuel processing.

Construction is being financed with \$200,000 in state funds, a \$375,000 grant from the National Science Foundation, and the remainder through private and industrial gifts.

However, Dr. Ralph G. Nevins, KSU engineering dean, indicates that fund-raising efforts to supply necessary equipment for the addition are continuing and urgently solicited.

KSU's department of nuclear engineering, acclaimed as one of the best in the nation, has a growing enrollment, according to Dr. Curtis G. Chezem, professor and department head.

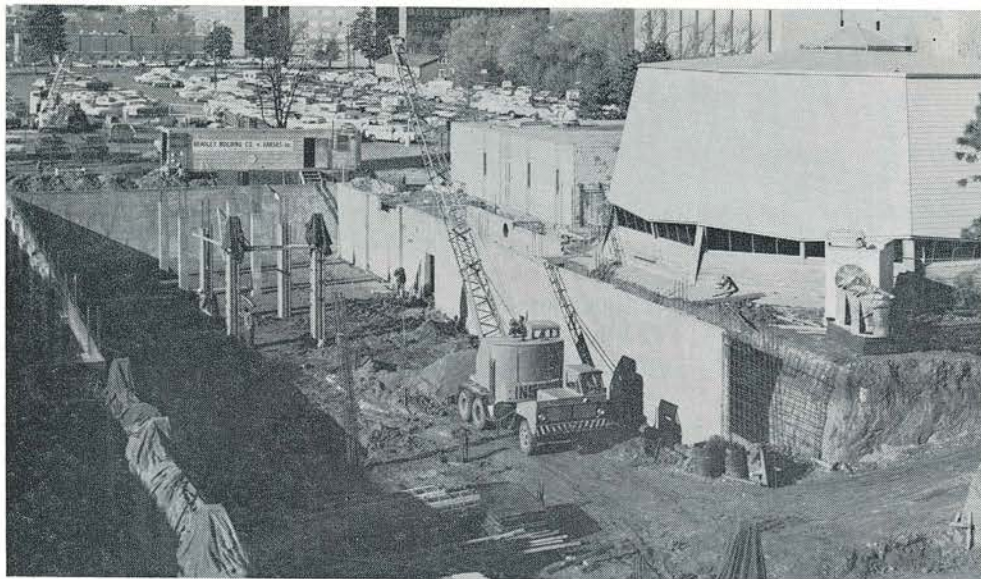
Nuclear engineering faculty and students are involved in some \$2.1 million in research contracts and grants.

The addition to Ward Hall will feature special teaching and research laboratories for nuclear fuel processing and radioisotope measurement. It will also have a hot cell and laboratory, fusion laboratory and other specialized equipment.

Dr. Richard E. Faw, chairman of the departmental faculty planning committee for the addition, pointed out that the new facility will include a neutron activation analysis laboratory.

"The new facilities will enable us to do a better job of training nuclear engineers for industry, particularly the electrical utility companies. The rapid expansion of the nuclear power industry has brought about an increased demand for nuclear engineers.

"We hope the new space will assist us in doing our share of closing the gap between the number of nuclear engineers needed and those actually being trained," Faw said.



ADDITION TO WARD HALL—Construction on the \$1 million addition to Ward Hall of the K-State department of nuclear engineering began in September. The facility should be ready for occupancy by next autumn.

Nuclear Engineering Uprates Reactor, Loaned Californium-252 for Research

K-State's department of nuclear engineering is uprating its Triga Mark II teaching-research reactor and has been awarded one of three new contracts for loan of californium-252.

A two-step uprating program is now under way, Prof. Robert W. Clack, director of the reactor facility, indicated.

The first step involves refueling of the reactor with fuel elements of improved design. The second step is license modification to permit operation of the reactor at increased power and high neutron density levels.

Loan of the californium-252, the new man-made radioactive material, was made by the Atomic Energy Commission (AEC). Other loans were made to the University of Cincinnati and to the U.S. Department of Agriculture Sedimentation Laboratory, Oxford, Miss.

Under a one-year contract, K-State will use five californium-252 sources, totaling 50 milligrams valued at \$525,000, for three areas of study, possibly a fourth.

Prof. Clack said the primary use of the reactor is in producing artificial radioactive isotopes. These are typically used in trace element studies. For example: following radioactive phosphorus in the metabolism of a plant.

"Higher power levels will enable production of stronger radioactive sources with shorter irradiations because of the increased neutron density available with higher power operation.

"The new fuel elements, with stainless steel cladding, are a precondition for operation at power levels above 250 kilowatts, the present maximum licensed power level for the reactor under steady-state conditions," Prof. Clack said.

During the past year, the reactor was used in more than 300 separate experiments involving four KSU departments and six other schools: Butler County Junior Col-

lege, Emporia State College, Ft. Scott Junior College, Kansas Wesleyan, Marymount and Wichita State.

Positive Aspects Seen In Individual Instruction

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Sprague and Nash see several positive results:

—We are getting more student effort in this course than we ever did before using conventional teaching methods.

—Students are working harder but think it is worth it. They seem to be getting more content with greater depth of understanding. They come out better able to plan, run, and document an engineering experiment.

—Because our students have laboratories open to them 40 hours a week for independent work, there is greater usage of those facilities than previously.

—Each student is responsible for his own progress. He can't ride the shirt-tail of somebody else or the group. Students generally feel like they are really accomplishing something. They feel like it is their own effort.

—Through careful record-keeping and documentation, we are able to detect deficiencies in each unit of instruction. We can correct these and see if things get better. They usually do.

—Considerable peer instruction takes place. Sometimes peers can communicate better than professors. This is fine with us.

News-worthy Notes

New chairman of the Kansas section, American Society of Agricultural Engineers, for 1970-71 is Dr. Charles K. Spillman, K-State assistant professor of agricultural engineering. He succeeds Ferrol S. Fell, engineering manager, Hesston Corporation.

Two KSU engineering educators—Prof. Robert E. Crank of mechanical engineering and Dr. L. T. Fan, professor and head of chemical engineering—are listed in the 1970 edition of "Outstanding Educators in America."

A KSU associate professor of mechanical engineering, Dr. Clyde H. Sprague, has been named to the New Engineering Educator Delegates (NEED) committee of the American Society for Engineering Education.

Dean Ralph G. Nevins has been accorded two recent honors: Richards Memorial Award "for outstanding achievement in mechanical engineering within 20-25 years following graduation" from the American Society of Mechanical Engineers, and a distinguished alumnus award from the department of mechanical-industrial engineering at the University of Illinois, Champaign.

Leslie C. Weber, director of research for Northern States Power Company, Minneapolis, Minn., presented a bioenvironmental engineering symposium Nov. 12 on "Electrical Power Production and the Environment." Sponsor: K-State Institute for Environmental Research.

Dr. Robert Kruh, dean of the K-State Graduate School, has been elected to the 17-member board of trustees of the Argonne Universities Association.

New editor of the K-State Engineer student magazine is John E. (Woody) Swain, Wichita, senior in mechanical engineering. He succeeds John S. Schwartz, Pittsburg, senior in electrical engineering.

The K-State department of agricultural engineering has the free use of a new Ford 3000 series general purpose tractor for a year through the generosity of the Manhattan (Kan.) Ford tractor dealer, Burns-Salisbury, Inc. It is being used for classroom activities.

Foreign environmental scholars presented lectures Dec. 3-4 to the KSU department of chemical engineering: Dr. L. A. Clarenburg of the Rijnmond Authority, Rotterdam, Holland, and Dr. Masakatsu Hiraoka of Kyoto University, Japan.

Contemporary, Traditional Classwork Taken by Students in Honors Program

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Reflecting back, he now also feels that the provocative discussions "made me more cognizant of what is going on now. They helped me understand my role as an engineer; how my work affects society.

"It also made me more cognizant of what I would be doing after getting out of graduate school," he said.

Director of the program, Dr. Kenneth K. Gowdy, assistant dean of engineering, is not particularly surprised by Miller's reaction.

Gowdy believes that most of the brighter engineering students see the value of and their need for taking many of the traditional as well as contemporary courses in engineering.

However, few engineering students in the program take more than two or three honors section courses because, to begin with, they tend to carry extra heavy course loads. KSU's undergraduate engineers usually take from 10 to 15 more credit hours in their undergraduate programs than do their counterparts in most other curricula.

To remain in K-State's engineering honors program, a student must maintain a 3.0 or "B" grade point average. Students with less than the required average are sometimes allowed to participate in the honors program if an engineering faculty member will support their application.

Gorton, Tripp Believe New 'Impact' Course 'Vital' to All Students

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A main goal of the course was to present information from differing perspectives. Guest lecturers for the class spoke of the technological implications of such subjects as pollution, science fiction and the future of engineering technology, engineer's image, power plants, education, computers, ecology, electronic music, and role of the engineer in society.

Tripp and Gorton had little difficulty in lining up speakers. They tried to set aside 20 minutes for class discussion following each lecture. Some lectures tended to be too long. The result: not as much class discussion as they would have desired. They hope to remedy this.

Both concluded the course is "vital, needed and necessary in everybody's curriculum: engineers and non-engineers alike. Engineers enrolled in the course were hopefully made socially aware. Perhaps the non-engineers will be able to vote more intelligently on technological issues."

Dr. Gorton was surprised by several things:

—Our undergraduate engineers are more socially aware and concerned than we give them credit for.

—There is apparently not a recognizable difference in the cultural backgrounds of engineers and non-engineers.

—Evidently social studies education at the high school level is much better than it used to be.

—Girls are more technologically aware than we thought. We were reprimanded for talking down to them on highly technical topics.

Tripp and Gorton believe that the "Impact" course is accomplishing its purpose: making non-engineering students in particular more aware of technology and its many implications.

Dr. Tripp indicated "we're especially concerned about the education major who will be teaching in the public schools. We believe these future educators can have an important impact on their students' knowledge of the technological-societal relationship."

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