

K-S Engineering College Sets 48th Open House For March 17-18

The theme for the 48th annual KSU Engineering Open House, set for Friday and Saturday, March 17-18, is "Engineering: Minds and Magic." This year Open House begins on St. Patrick's Day. St. Patrick is the engineers' patron saint.

Open house hours Friday are 6 to 9 p.m. and Saturday from 9 a.m. to 4 p.m. The open house weekend is traditionally the biggest extra-curricular activity for the undergraduate engineering student body. This event is held each year the Friday and Saturday following St. Patrick's Day.

Now is a good time to invite one or more prospective KSU engineering students, male or female, to come to the campus to see the many creative student displays and exhibits.

Finalists, all Kansans, for the balloting for open house royalty—St. Patrick and St. Patricia, his lady — have been chosen. St. Pat and St. Patricia will be crowned at coronation and ribbon-cutting ceremonies Friday at 6 p.m.

St. Patricia candidates: Carole Bolin, Overland Park; Jan Townsend, Leoti; and Mary Waring, Garnett.

St. Pat finalists: Ralph W. Carlson, senior in electrical engineering, Herndon; Kent M. Miller, junior in civil engineering, Leawood; and Richard W. Porter, senior in chemical engineering, Reading.

Gov. Robert B. Docking of Kansas has proclaimed the week of March 12-18 as KSU Engineering Open House Week in the state.

Open house week activities get underway Monday with balloting for royalty. Thursday at 9:30 a.m. the College of Engineering Advisory Council conducts its semi-annual meeting. That evening at 6 the 48th annual meeting of the KSU Engineering Dean's Club will be held with Dean Ralph G. Nevins presiding.

The second annual Dean's Convocation Address will be delivered by Dr. Nevins at

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ST. PAT AND ST. PATRICIA CANDIDATES — Finalists for royalty to reign over the 48th annual KSU Engineering Open House March 17-18 include (l. to r.) Mary Waring, Jan Townsend and Carole Bolin for St. Patricia, and Ralph W. Carlson, Kent M. Killmer and Richard W. Porter for St. Patrick.

Urban-Area Vehicle Team To Display at Open House

A K-State engineering design team, one of about 40 entries for U. S. and Canadian schools participating in the national Urban Vehicle Design Competition (UVDC) coordinated by MIT students, is progressing well in its design of a low pollution urban-area car.

UVDC is designed to encourage tomorrow's technologists to work as a group in the design and construction. The team includes some non-engineering students, says Dr. Thomas B. Swearingen, faculty adviser.

KSU's entry, like groups from other institutions, is working as a team to design a vehicle suited to city driving and parking of the 1980's.

Swearingen reports that K-State hopes to have its prototype urban vehicle about 50 per cent completed for the 48th annual KSU Engineering Open House set for March 17-18. The deadline for the national competition is August when the final phase of the competition will be conducted.

A 1600 cc Cortina engine, operated with liquified petroleum gas, equipped with a

capacitor discharge ignition system is being used by the K-State team.

"The combination of the two gives very low emissions—about a 90 per cent reduction in hydrocarbons and carbon monoxide from regular gasoline," Swearingen pointed out.

K-State urban vehicle "will have a commercially available dune buggy body modified to meet safety specification of UVDC. The tubular frame is currently being fabricated.

The team captain, Dave Kolarik, senior in mechanical engineering, Caldwell, Kan., says \$500 is still needed for a trans-axle system and other equipment.

Entries will be tested in August on emissions, performance, noise, turning

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KSU's Dr. Larry Schmid Develops Phosphate Removal Process

At 31, Dr. Lawrence A. Schmid has already made a significant contribution to the solution of pollution problems, an area of considerable concern to many persons in the state and nation.

Schmid's contribution: a lime-biological process for removing phosphorous from sewage and water.

The reason his process is so significant is that phosphates emanating mainly from laundry detergents are literally choking the waterways in many of the most populous areas of America.

Detergents from washing clothes, Schmid said, are now fed into sewers at an alarming rate proportionately greater than the population growth: about four lbs. per person or 800 million lbs. annually.

He explained that phosphates in these cleaning agents serve as a nutrient for algae which in recent years have multiplied so fast in some areas that they're "literally choking our lakes." He explained, however, that this is not a universal problem and that many of our streams and lakes are able to accept this phosphorus without any apparent harm.

Most modern detergents contain up to 50 per cent phosphate.

This excessive detergent flow causes two problems: It creates an overabundance of organic material, primarily algae, in the water. When this material dies, it decomposes and depletes the source of oxygen for fish and aquatic life.

Schmid, now in his fourth year on the KSU civil engineering faculty, conducted a pilot project using his process at the Manhattan (Kan.) Sewage Treatment Plant. This project was largely supported by a grant from the Environmental Protection Agency. His pilot plant handled about 20,000 gallons of sewage daily.

Schmid used some "good ole Yankee ingenuity to fabricate makeshift equipment. You can't foresee all the design changes that are usually required in research of this nature," he said.

For example, Schmid designed a variable flow system which programs the amount of raw sewage flowing through his Addigest Treatment Plant manufactured by Smith and Loveless, Lenexa, Kan.

His variable flow system is set up with a 24-hour clock with a cam. That way the pilot plant can simulate the high flow of sewage during the day and the low flow at night.

He has found that his phosphate removal process is practical, removes about 90 per cent of the phosphates, and is quite economical: 2-5 cents per 1,000 gallons treated. His research has yielded design criteria to be used in design of future plants.

Under his phosphate removal process which he developed as a graduate student, the majority of phosphates in raw sewage are solidified by lime and then settled. This

Dr. L. A. Schmid



is followed by a biological process in which growth of bacteria removes the remaining phosphates. He described the lime-biological phosphate removal process in greater detail:

"When you mix the two (lime and phosphorus) together, you get a calcium-phosphorus precipitate. The precipitate which contains about 80 per cent of the initial phosphorus in the sewage settles out at the bottom of a settling tank. The precipitate is taken out of the bottom of the tank for further treatment and disposal, where it is eventually returned to the land in some form.

"Then the next stage of the process involves use of bacteria which we grow on the organic material remaining in the sewage after lime treatment.

"This is done in what we call an aeration tank where we add oxygen to support the bacteria. As they grow on the soluble organic food, they remove the remaining phosphorus in the process, incorporating it into their cells.

"The bacteria settle out readily so after about six hours of aeration, we settle them out in a settling tank. We don't let the microbes get by with this small amount of work. So we pump most of them back to the aeration tank to multiply and pick up another load of phosphorus and organic pollutants.

"After settling, the water discharged is clear, low in phosphorus and organic material," Schmid said.

His work is having an impact outside the state.

The City of Rochester (N.Y.) is building a treatment plant which incorporates his process for removal of phosphates. He said "a couple of more treatment plants out east are also using the process."

Green—Patron Saint's Color

The bright green, second color used in this IMPACT Newsletter, is in recognition of St. Patrick's Day, March 17. St. Patrick is the engineers' patron saint and green is his color. Bright green will be "in vogue" for the 48th annual KSU Engineering Open House March 17-18.

More Research Funds Received by College

A total of \$287,119 in research grants and contracts has been awarded to the University through the KSU Engineering Experiment Station since July 1, 1971, reports Prof. Dwight A. Nesmith, EES director.

This amount is nearly twice the dollar total of \$147,309 at the corresponding date last year, Nesmith said.

The \$287,119 in grants and contracts includes \$48,271 from the National Science Foundation to conduct an eight-week summer institute for high school teachers dealing with the "Power of Society on the Environment."

Dates for this institute are June 25-Aug. 19. The 30 secondary teachers of physical science and biology selected for the institute will receive six hours of graduate credit and stipends. Director is Dr. Walter Meyer, professor of nuclear engineering.

Dr. Kendall F. Casey Jr., associate professor of electrical engineering, received a one-year, \$17,300 grant from NSF to conduct basic research into ways of improving electronic communication.

In Casey's opinion, results of this research could mean:

1. Better reliability of long distance radio communication.
2. Improved submarine communication.
3. More knowledge about the re-entry plasma sheath which causes the well-known communications blackout.

Additional new contracts since July 1:

—Dr. E. Stanley Lee, associate professor of industrial engineering, "Modeling and Optimization of Water Resources Systems-Phase III," Office of Water Resources Research.

—Dr. L. T. Fan, professor and head of chemical engineering, and Dr. C. L. Hwang, associate professor of industrial engineering, "Modeling and Optimization of Transient Cooling Water Discharge from Power Generating Plants," Kansas Water Resources Research Institute.

—Dr. Meyer, "Nuclear Materials Control and Safeguards," Atomic Energy Commission through Argonne National Laboratory.

—Dr. Larry E. Erickson, associate professor of chemical engineering, "Design and Control of Transient Waste Treatment Processes," KWRRI.

—Dr. Lee, "Analysis, Modeling, and Forecasting of Stochastic Water Quality Systems," KWRRI.

—Dr. Fan, "Systems Engineering Approach to Environmental Pollution Control," NSF.

—Fort A. Verser, instructor of nuclear engineering, "Gamma Ray Attenuation Modeling Validity," Office of Civil Defense.

—Dr. Ralph G. Nevins, director, KSU Institute for Environmental Research, "A Special Study of Instruments Used for Measuring Performance of Air Conditioning," American Society of Heating, Refrigerating, and Air Conditioning Engineers.

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

—Dr. Fan, "Evaluation of Iodine Resin for Water Purification," KSU Research Foundation.

Five contracts have been renewed:

—Dr. Emerson L. Besch, professor and head of physiological sciences, "Studies of Ventilation and Air Conditioning Requirements of Laboratory Animals," Department of Health, Education and Welfare.

—Verser, Professional Advisory Service Center, OGD.

—Dr. Corwin A. Bennett, professor of industrial engineering, "Discomfort Glare," Illumina Engineering Research Institute.

—Dr. Meyer, "Fast Neutron Transmission Measurements for Reactor Core and Shielding Materials," AEC.

—Dr. F. C. Appl, professor of mechanical engineering, "Cutting Action and Wear of Diamond Cutting Tools When Cutting Metallic Materials," Christiansen Diamond Products.

Two New Groups Begun for Students

Two new student organizations have been formed in the KSU College of Engineering: Society of Women's Engineers, and Tau Beta Gamma, college-wide engineering honorary.

Dr. Doris Grosh, assistant professor of industrial engineering, and Dr. Curtis G. Chezem, professor and head of nuclear engineering, have spearheaded establishment of the new women's chapter. SWE has 11 members this semester and is led by Miss Laree A. Mugler, senior in mechanical engineering, Clay Center, Kan.

The women's group includes both student and faculty membership. Dr. Grosh said that student members should be in a recognized college or university pursuing a course of study leading to a degree in engineering or a science related to engineering. Members major in engineering, mathematics, physics, chemistry or computer science.

Tau Beta Gamma is in the second year of a two-year probation period and expects to receive national recognition next fall. Dr. Frank A. Tillman, professor and head of industrial engineering, is faculty adviser.

President David A. Kolarik, senior in mechanical engineering, Caldwell, Kan., said the KSU Tau Beta Gamma group has 20 members and is staging a membership drive this semester.

To qualify, seniors must be in the top 20 per cent of their classes academically. Juniors must be in the highest 10 per cent.

Choose 'Minds and Magic' As Theme for Open House

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10:30 a.m. on Friday in the Forum Hall, K-State Union. It will be given before upperclassmen and faculty of the College.

The fourth annual Engineering Alumni Symposium starts at 9 a.m. Saturday. An informal luncheon for College alumni and friends attending the symposium is set for 12 noon. Dr. Nevins is in charge.

Concluding open house festivities will be the fifth annual Engineering Open House Awards Banquet at 6 p.m. in the K-State Union Ballroom with KSU President James A. McCain presenting the Distinguished Service Award in engineering to an alumnus of the College.

Entertainment will be provided by Larry Weigel, former Wildcat basketball star now with the University's Endowment Assn.

Following the banquet, a play entitled "The Monks" will be performed starting at 8 p.m. in the Forum Hall by the drama department.

This play will be open to alumni and friends of the College attending open house and alumni symposium activities. Tickets (\$1.50 each for adults and 75 cents for students) will be available at the door.

Time Away from K-S Campus 'Helpful' to Two Professors

For a variety of reasons, a sabbatical or leave-of-absence for the contemporary faculty member is a valuable, oftentimes-enriching experience to him, his educational institution, and most of all to students.

Two KSU engineering educators with the rank of associate professor have recently returned to their classroom responsibilities after being away: Dr. Floyd W. Harris of electrical engineering and Dr. M. John Robinson of nuclear engineering. Both feel they've benefitted considerably especially in terms of sharpening their perspectives professionally.

Harris was on an 18-month appointment with the American Electric Power Service Corporation, New York City. Robinson served a year as an International Atomic Energy Agency (IAEA) technical assistance expert at the Institute of Atomic Energy, Sao Paulo, Brazil.

Harris' employment was arranged by the American Society for Engineering Education and the Ford Foundation program for residencies-in-engineering-practice.

He explained that his experience had three significant benefits for him: (1) gaining additional industrial experience, (2) working with top-rate engineers who are involved in seasonal or short-term and long-range electric utility system planning, and (3) making professional contacts at the national level.

In working with the chief planning engineer, Harris felt that he learned more about how corporate management may expand technically.

Since returning to the KSU campus, he reflected succinctly on how the ASEE residency has changed his thinking and frame of reference:

"I'm certainly more practical, more aware of the needs, problems and capabilities of the utility and electric power industry. My teaching now tends to be slightly less theoretical.

"It was profitable. A good experience. All of us dealing with the education of engineers for tomorrow ought to get away for some reacquainting and updating. It's good for us," Harris said. His residency came after six years on the KSU faculty.

Robinson's assignment came about from a request by the Brazilian Commissao Nacional de Energia Nuclear (CNEN) to the IAEA for assistance with design, construction and operation of a laboratory for heat transfer and fluid flow research in connection with the Brazilian nuclear power program.

The assignment was carried out in Sao Paulo, location of one of three nuclear institutes operated by the CNEN, and site of the new laboratory.

"Brazil has recently ordered its first nuclear power plant, an approximately 800



Robinson

Harris

MWe plant, from Westinghouse. The Brazilian estimates are such that about one large nuclear electric generating plant will be required per year starting in 1980. Thus, they are rapidly expanding in the technological areas associated with this industry in order to be able to nationally produce as many of the components as possible for these anticipated plants.

"The Brazilians have an excellent educational system to produce the engineers that they will need to meet the challenge of a rapidly expanding nuclear industry. However, they have a definite need for expanding their experimental programs, and need to attract more people into the nuclear energy programs. The very rapid technological development of the country at present has resulted in a competitive situation for engineers between the government laboratories and the private industry," Robinson pointed out.

Robinson concluded that the impact of this assignment in fulfilling his teaching responsibilities at KSU "is tremendous. Since, by nature, the nuclear power area is international, this experience has given me a much broader outlook on my profession and a wealth of information that I can pass on to my students."

In addition to assisting with the design of the laboratory building, Dr. Robinson, who joined the KSU faculty in 1966, taught a reactor heat transfer course and helped initiate several experimental research programs in heat transfer and fluid flow.

Urban Car Designers Display at Open House

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circle, parkability, safety, production cost, crash test, energy efficiency, drivability and space utilization.

"Our design objectives are to build an urban vehicle that is relatively pollution free, safe, economical to operate, with minimal loss of horsepower and generally appealing to the American public," Swearingen said.

NEWSWORTHY NOTES

The seventh annual Engineering and Science Summer Institutes are set for June at KSU. ESSI, co-sponsored by the Kansas Engineering Society and the College of Engineering, will include 100 of Kansas' top science and mathematics students.

Larry G. Berglund, 33, Edina, Minn., in December became the first student to complete a Ph.D. in bioenvironmental engineering program. He is now an assistant professor of mechanical engineering at Michigan Technological University, Houghton.

Rock tunes and animated cartoon characters of ions, electrons and neutrons will be used nation-wide to teach teen-agers about atomic energy. Lessons will be taught via six 30-minute films, a series called "Living in a Nuclear Age." The films are being prepared by the KSU Division of Cooperative Extension in cooperation with the department of nuclear engineering.

Dr. Philip G. Kirmsler, professor and head of applied mechanics, is one of 38 distinguished applied mathematicians selected as visiting lecturers for 1971-72 by the Society for Industrial and Applied Mathematics (SIAM). Kirmsler is one of four lecturers listed in SIAM's south central region.

Larry L. Jones, EE '60, Lee's Summit, Mo., has presented a \$1,250 check from Western Electric to the Solid State Engineering Laboratory of the department of electrical engineering at K-State.

Dr. Do-Sup Chung, associate professor of agricultural engineering, served as a technical assistance expert Sept. 27 to Oct. 9 in Guatemala City, Guatemala, at the National Institute of Commercialization and Agriculture through the Agency for International Development. He helped evaluate 19 grain storage facilities and made design recommendations.

A former applied mechanics instructor, Dr. Carol Rubin, was among American migrants to Israel interviewed on the 7 a.m. CBS-TV news show Oct. 15. She and her husband teach at University of Haifa. Carol received her Ph.D. at KSU.

Dr. Ralph G. Nevins, director, KSU Institute for Environmental Research, has been named a fellow of the American Society of Heating, Refrigerating, and Air-Conditioning Engineers. He is one of 17 named this year.



URBAN-AREA VEHICLE FABRICATED AT K-STATE — K-State's College of Engineering will have an entry in the national Urban-Area Vehicle Design competition. In fact, the K-State design team headed by Dave Kolarik (c.) hopes to have its vehicle ready for showing at the 48th annual KSU Engineering Open House March 17-18. Shown with Kolarik are Dr. Thomas B. Swearingen (l.), faculty adviser, and Alan W. Johnson, senior in agricultural engineering.

Hungarian Engineer Dr. G. Szabo Studies with Dr. R. G. Nevins

Dr. Gyula Szabo of Budapest, a mechanical engineer with the Building Research Institute of Hungary, visited the KSU College of Engineering from September through November to study and work with Dr. Ralph G. Nevins, director of the KSU Institute for Environmental Research (ERI).

Dr. Szabo came to K-State for "general observation and to study and learn our techniques and methods for calculating heat and air conditioning loads as well as thermal response of buildings being constructed," he said.

He came to Manhattan under an international exchange program between the U.S. and eastern European nations including Bulgaria, Czechoslovakia, Hungary, Poland, Rumania, Soviet Union and Yugoslavia.

The program is called IREX, International Research and Exchanges Board. Dr. Joseph Hajda is the KSU campus coordinator.

After spending two and a half months at KSU, Dr. Szabo went on to the University of Illinois, Champaign-Urbana, Dec. 1 to work with Prof. W. F. Stoecker. He planned to return to Hungary sometime in February.

His work the past five years in Hungary has been concerned with heating, air-conditioning and ventilating loads of buildings. He has calculated "expected temperature patterns in rooms having no air-conditioning.

"Air conditioning is not as much a necessity in Europe. You have to find out how it (a building) would be without air conditioning," he pointed out.

He calculates from meteorological data the "heat exchange between buildings and the natural environment surrounding that building. This is all described in numerical form," Dr. Szabo said.



Dr. Gyula
Szabo

Another problem he must concern himself with is solar radiation through a building's glazing system (windows). He might be called upon to compare the radiation using shaded and non-shaded glass.

IMPACT is published by the College of Engineering, Kansas State University, Manhattan, Kansas 66502. Subscriptions are available without cost upon written request. Material may be reproduced without permission, although credit to the source is appreciated.

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