

New programs are added to agreement with Kansas Schools

Several programs have been added to the existing exchange agreement which UM has with the University of Kansas and Kansas State University.

Under these programs, qualified students who would be eligible to pay only resident fees at UM may enroll in certain programs in one of the state universities of Kansas and be charged fees at the rate paid by Kansas residents. Similarly, Kansas residents can attend UM in certain selected programs and pay only the Missouri incidental fee.

The exchange agreement enables the two states to make use of specialized programs in the other state at the same time that it allows considerable savings for the student.

New programs available to qualified Missouri residents include:

At the University of Kansas at Lawrence,

- Ph.D. in linguistics
- M.S. in music therapy
- M.A. in Oriental languages and literature

At Kansas State University at Manhattan,

- Master of Architecture
- M.S. and Ph.D. in bakery science and management
- M.S. and Ph.D. in feed science and management
- M.S. in landscape architecture
- M.S. and Ph.D. in milling science and management

UM programs covered are:

- At UMKC,
- B.S.D.H. in dental hygiene
- Doctor of dental surgery

At UMC,

- Ph.D. in atmospheric sciences
- B.S.F.W. in fisheries and wildlife
- B.S.F. in forestry

At UMR,

- B.S. in ceramic, geological, metallurgical, and mining engineering
- B.S. in engineering management

The B.S.F.W. at UMC is a new offering under the exchange agreement.

Brochures explaining details of the programs are available through the campus admissions offices.

A total of 241 Kansas residents were enrolled in programs at UMKC, UMC, and Rolla during the fall semester of 1978. A total of 233 students were enrolled in the 1979 winter semester.

The number of Missouri residents who took advantage of the arrangement with the two Kansas institutions totalled 304 at the University of Kansas in the fall of 1978 and 282 in the winter semester of 1979. At Kansas State University 397 Missouri residents were enrolled in the 1978 fall semester and 353 in the winter semester of 1979.

Other such arrangements include an agreement with the University of Nebraska; a UMC mid-Missouri consortium agreement with four private colleges; an UMSL agreement with two private universities affecting only



By David Lammers

Jean Cerra, women's athletics director at UMC, remembers the days when teammates on her college volleyball team wore the standard pristine white blouses, scrambled for rides to out-of-town games, and sold cakes and cookies to raise travel money.

Competitive athletics among women "wasn't the thing to do" in the 1950's, Ms. Cerra explains. Colleges

"Hey, I'm not getting intensive enough coaching."

and high schools just did not support women's athletics.

Times have changed. Or rather, times are changing for women athletes.

Sports and physical conditioning for women have become the "in" thing now—witness the establishment of track shoes and sweat suits as fashion items.

Many high schools activated sports programs for women in 1974, under pressure from the now-famous Title IX. Those women are now entering college with competitive spirits resulting from their high school experiences.

"Some of the women athletes who came to us just a few years ago had perhaps one year of high school coaching, and, of course, no 'little

graduate students; and a UMKC agreement with 14 Kansas and Missouri institutions through the Kansas City Regional Council for Higher Education.

A tri-state proposal which would cover all graduate students in the three states of Missouri, Kansas, and Nebraska has been approved by the Board of Regents in Nebraska, and the UM Board of Curators. It awaits action by the Kansas Board of Regents.

league' type experiences," Ms. Cerra said. "Now, the freshmen are coming here and telling us, 'Hey, I'm not getting intensive enough coaching.'

"The younger girls are used to competition in ways that some of the older women athletes are not. Some women still just want to have a good time, and go out and play in the sun. But now we have young women who are saying they are willing to sacrifice to get to the 1980 Olympics."

Increased interest in athletics has caused the women's intramural program at UMR to double in five years. Also, the UMR women's basketball team, which went intercollegiate five years ago, had a 25-6 record last year.

The annual interest survey conducted by Annette Caruso,

student recreational facilities development fees. No state funds are involved in the construction, which was approved by the curators last fall.

Judith Berres, UMSL's women's athletics director, says that the success of UMSL's athletic program for women is due to "enlightened people" on the St. Louis campus. Ms. Berres was hired in 1971, and by the next year UMSL women were competing in extramurals. By 1974, varsity sports for women had begun, and now women's teams compete in field hockey, volleyball, softball, tennis, swimming, and basketball.

"We are in a competitive atmosphere with the men here. Sure, there are things we would like to have, but they will come. The men are in the same position, trying to get more

"Some women still just want to . . . go out and play in the sun. But now we have young women who are saying they are willing to sacrifice to get to the 1980 Olympics."

women's athletics director at UMR, indicated that a majority of the 550 women at UMR wanted a softball team and were no longer interested in volleyball. As a result, the volleyball team has been dropped and a varsity softball team is planned for this year.

At UMKC, fencing and golf at the club level are open to women, and there is an intramural women's program. Volleyball is the varsity women's sport at UMKC.

"At the varsity level, you might say we are stymied financially. It takes money for scholarships and traveling," Ken Webster, UMKC athletics director, said.

UMKC Vice Chancellor for Student Affairs Gary Widmar points to a lack of athletic facilities at UMKC as part of the problem. "The athletic committee several years ago made the decision not to proliferate the sports program because of our relatively restricted funding. We have a poor facility, a small gym. Almost any high school has a better gym, and without a better facility I don't see how we can expand our athletics program for men or women."

However, UMKC is building six tennis courts, handball-racketball facilities, and two multi-purpose playing

"If we are going to ask for comparable salaries and staff, then we had better be willing to accept the pressures that go along with that"

fields. The funding of \$725,000 comes from UMKC bookstore earnings and

money to do more things."

Ms. Cerra says women's sports enjoy a level of support almost equal to comparable men's teams at UMC. Because women in athletics expect to be equally funded with the men's programs, women must be willing to compete with an intensity equal to their male counterparts, she said.

"If we are going to ask for comparable salaries and staff, then we had better be willing to accept the pressures that go along with that to produce a quality, competitive winning program," Ms. Cerra said.

"Intercollegiate athletics is where we ask young women to be top quality, and to compete. We have an intramural program to counteract the competitive programs. Winning is not all-important here, but the desire to win is very important," she said.

AAUW recognizes UMC women's athletics

The American Association of University Women recently recognized UMC for special efforts in the development of its athletic program for women.

UMC is one of four institutions and a coalition which received certificates for outstanding programs and policies intended to achieve equity for women on their campuses. The women's athletic program at UMC offers eight intercollegiate sports, and athletic scholarships have increased from \$7,000 in 1975 to more than \$100,000 now.

Nuclear energy, issues and uses

Silicon

by Larry Myers

Hidden inside televisions, radios and microwave ovens are dozens of electronic components that may have "graduated" from UMC.

The odds are good that silicon, the heart of components such as transistors and diodes, was processed in the UM Research Reactor. As a result of the treatment, manufacturers are able to create better, more dependable electronic devices.

Semiconductor-based components such as transistors are made from specially-grown pure silicon crystals treated or "doped" with chemicals such as phosphorous so as to create specific electrical properties.

Unfortunately, conventional chemical doping results in crystals that are not uniform. Doping that produces the desired results at the center of the crystal may cause undesirable properties near the exterior. Consequently, much of the crystal, which is expensive, must be discarded.

But thanks to research into radiation effects begun in the mid-50's at the Atomic Energy Commission's Oak Ridge facilities and continued by researchers at Bell Telephone Laboratories and elsewhere, scientists discovered a method of using nuclear radiation to transform uniformly a portion of the silicon into phosphorous. The result is a more uniform silicon, which in turn is the foundation for better, more reliable semiconductors.

Single-crystal silicon transmutation doping, as it is called, is simpler than it sounds. Ten-inch-long rods of silicon crystal are sealed inside aluminum capsules, lowered into the glowing blue depths of the research reactor pool and exposed to neutrons emitted by the radioactive core.

The process depends on the ability of naturally-occurring isotopes in silicon to capture slow-moving neutrons emitted by the reactor. Once a neutron is captured, it creates an unstable silicon atom. According to Jon Meese, senior research scientist at the reactor, within two and one-half hours the unstable atom gives off an electron and is transmuted into phosphorous.

Because silicon isotopes are evenly



Senior operator James Tunink removes silicon from reactor cooling pool.

distributed throughout the silicon, the transmutation-produced phosphorus also occurs evenly in the crystal instead of exhibiting the non-uniformity of chemically-doped material. Consequently, virtually the entire crystal can be used to manufacture transistors, diodes and the like.

There are additional benefits resulting from the material's near-perfect uniformity. One of them is that small pieces of silicon can be used

to manufacture electronic components. Irradiated silicon devices will carry a heavier load, other things being equal, than those made from chemically-doped silicon. And in electrical terms, transmutation-doped silicon can tolerate higher voltages before it breaks down.

While such advantages may seem abstract, they result in more reliable semiconductor devices, no small matter when one considers the major role electronics plays in our lives.

Selenium

by Nancy Davis

Efficiency—developing something faster and better. That's American.

That drive to be more efficient has lead UM researchers to an improved methodology which they hope will pay dividends in their study of cancer.

J. Steven Morris and his colleagues at the UM Research Reactor have been studying the element selenium, trying to determine how it figures in health.

Low selenium levels in the body have been linked to cancer and heart disease, while high levels are toxic.

But in trying to find out how much selenium is needed to inhibit the growth of cancer cells, the UM scientists found the conventional research methods slow. This meant that completed studies were based on relatively few samples, leaving the results open to question.

After considerable experimentation, the team arrived at a new approach, one so efficient, in fact, that Dr. Morris estimates he and his colleagues now have analyzed more samples for selenium than any other research team in the country.

In their work, the researchers use neutron activation analysis. They place samples of human blood in the reactor and bombard it with neutrons to make it radioactive (that is, to make it an isotope of selenium). Since radioactive nuclei give off distinct radiation as they decay, the amount of selenium in each sample can be measured by the kind of radiation the sample emits.

Then, by comparing the amount of selenium in each sample to records of cancer patients, the scientist can link the level of selenium to disease.

However, the isotope of selenium the scientists had been measuring in the blood was requiring weeks, sometimes months in the reactor core to produce. By measuring a different isotope, one that takes only 5 seconds to produce in the reactor, the researchers cut the total processing time to 60 seconds per sample.

Now, instead of processing 20 to 50 samples a week, the researchers can study a sample every 60 seconds. The only limit is the scientist's endurance.

Safety?



UM's Ardash Emmons, left, debates the merits and dangers of nuclear energy with James W. Benson, a nuclear safety consultant.

In spite of the near miraculous feats accomplished through nuclear power, the serious question of its safety as a major source of energy for the

country is by now all too well known.

Debating both sides of that question at UMR's Conference on Energy Oct. 16-18 were Ardash

Emmons, UMC professor of nuclear engineering, and James W. Benson, a nuclear safety consultant.

The two found themselves on the opposite sides of several issues including nuclear safety, future energy demands and the economics of nuclear power.

Both men agreed that Missouri is unprepared to cope with a serious nuclear accident. However, Dr. Emmons contends that nuclear power is needed to maintain the current living standard.

"I don't think our people and our children are going to be pleased with anything less than growth and a continued relatively high standard of living," he told the Rolla audience.

On the other hand, Dr. Benson believes the country's current lifestyle cannot continue and, in fact, predicts that in the future we will use less energy overall than we are using today.

That doesn't necessarily mean a decline in the quality of our lives, he

said, but rather "less of an emphasis on material resources."

Dr. Benson believes the nuclear industry has downplayed the consequences of serious accidents and the effects of long-term radiation exposure, citing an increasing incidence of cancer as a possible result.

Dr. Emmons challenges this. "... One in seven people can expect to die of cancer independent of, in spite of, or even with the normal radiation exposure they get from being alive," he said. "Everyone exists in a God-made environment where he's subjected daily to radiation exposure."

The real costs of nuclear power "have absolutely not been included" in published costs because they don't figure in permanent waste disposal or the expense involved in insuring plant safety, Dr. Benson said.

However, Dr. Emmons quoted reports comparing nuclear and coal operations, which showed nuclear costs for production of energy to be less.

Of antiquities in ink and clay . . .

Cyprus legacy



Excavation director David Soren and associates at the site of the ancient ritual dance building in Kourion, Cyprus. The structure probably enclosed a sacred grove of trees.

What Canterbury was to medieval English Christians, the Apollo Sanctuary at Kourion was to ancient Cypriot worshippers—a shrine, a place of worship, ample housing for the night.

Now, after more than 20 centuries of having lain buried in the dust of southwest Cyprus, this authentic pilgrimage center is finally being unearthed. Directing its excavation are David Soren, UMC associate professor of art history and archeology, and Diana Buitron of the Walters Art Gallery in Baltimore.

The site, one of the major sanctuaries in the Mediterranean, features two temples dedicated to the Greek god Apollo; an open-air precinct thought to have been used for ceremonial dancing; at least four tombs; and even the dormitories to house the worshippers. A bath building and exercise grounds were contributed by the Romans.

Still clouded in mystery, the site once hosted a religious cult of undetermined nature, at least in its

this ancient worship, reports that any cult member who touched the altar of Apollo Hylates (Apollo of the Woodlands) would be flung from nearby cliffs into the sea. Although little else was known of the cult until recently, the past two seasons' findings at the site have shed new light on these ancient peoples' practices and beliefs.

The site's proximity to the sea probably accounted for its popularity as much as the mysterious religion and well-preserved structures did. Its situation on a cliff overlooking the Mediterranean coast no doubt gave it a more dramatic appeal than any inland site could possibly have afforded.

The site is also famous for its thousands of unusual terra cotta human and animal figurines showing ecstatic dancers, tree and pillar worship, sheep being sacrificed, worshippers praying, bulls with snakes crawling up their feet and chariot drivers.

Many of these objects are now on exhibit at the Museum of Art and Archeology in Columbia, where they

"Figurines, fragmentary though they are, are found by the hundreds . . . Here is a man standing erect, left hand raised to the sky . . . He hails me across the centuries."—John Huffstot, Excavation photographer and artist

earliest days. The sanctuary was later usurped by the Greeks and then the Romans, and the original cult gods were gradually assimilated by classical deities.

Strabo, one of the chroniclers of

will remain through Dec. 2. With them are works from the Cyprus Museum at Nicosia, the Walters Art Gallery, the University Museum in Philadelphia, the Nelson Gallery in Kansas City, Dartmouth College, and the Art and

Archeology Museum's own permanent collection. After the exhibit closes here, it will travel to the Walters Gallery and Dartmouth College.

Vassos Karageorghis, director of the Cyprus Department of Antiquities, was flown directly from Cyprus to Columbia to be guest of honor and principal speaker for the opening of the exhibit Oct. 12. A symposium featuring many noted archeologists from throughout the country was held the following day, and marks the first time that such events focusing on ancient Cyprus have been held in Columbia.

Dr. Soren's work, however, is far from completed. The National Endowment for the Humanities grant, which funded the excavations begun in 1977, have been followed by grants from the Alumni Development Fund and the Research Council.

Over the next four years Dr. Soren and his colleagues will use these funds, along with funding from Dartmouth



College, the Walters Art Gallery, the University of Maryland-Baltimore County, and the Department of Antiquities of Cyprus, to complete the excavation of an extraordinary round building which, from clay models that have been found, appears to have been a ritual dancing area enclosing a sacred grove of trees. Such a structure is unique in Mediterranean archeology and dates to the time of Christ.

Dr. Soren's work also involves the rebuilding of the ancient sanctuary as Cyprus' major tourist attraction. The buildings collapsed from a devastating earthquake now known, through these excavations, to have occurred in 370 A.D. Most of the walls and structures, therefore, were left intact but buried. The Cypriot government is sponsoring the rebuilding program from blueprints

that Drs. Soren and Buitron have proposed.

This recent venture into the antiquities of Cyprus marks only the latest chapter in UM's long-standing association with that country. In 1951 UMC Professor Saul Weinberg was invited to complete work on a



publication left unfinished at the untimely death of John Franklin Daniel, who had excavated a Cypriot site for the University of Pennsylvania from 1937 to 1948. While working on this publication, Dr. Weinberg discovered a totally "new" Bronze Age site in Cyprus, to which he returned in the 1950's to excavate a Bronze Age cemetery.

After Dr. Weinberg's expedition, which yielded objects in the current exhibition, UM continued its interest in Cyprus through the acquisition of 39 objects from the Cyprus Museum in Nicosia. In 1963-64 a noted Cypriot archeologist, Professor Paul Astrom from the University of Goteborg, Sweden, was a visiting associate professor at UMC. And further acquisitions of Cypriot objects for the museum were forthcoming in 1973. These objects, a group from tombs near Nicosia and Lapatsa, are also included in the current Cyprus exhibition.

Thirteen more objects, recently acquired from the Cypriot government as near-gifts, include various types of pottery. As lovely as these are, however, they are only a sign of the more important benefits that the Cyprus excavation has provided—an excellent opportunity for UM students and faculty to work and travel in the Mediterranean; the assembly of one of the few travelling exhibitions to emanate from a non-urban midwestern university; and the assurance that UM is, indeed, an international force in archeology.

Chaucer in Missouri

The continuing importance and universal nature of an ancient literary work can usually be measured by the variety of people who have translated it over the centuries. In the case of Boethius' "The Consolation of Philosophy" this includes King Alfred the Great of England, who gave it an Anglo-Saxon reading; Geoffrey Chaucer, who translated it into Middle English in the 14th century and Queen Elizabeth I who made it a Renaissance priority. Thus, fascination with the Latin work spans a period of some 600 years, a claim to immortality that few such works possess.

Now, after several years of anonymity, a fragment of the Chaucer manuscript has been identified as part of the Fragmenta Manuscripta collection that UMC's Ellis Library purchased in 1968. The fragment is

the only example of this text in a North American collection. It was identified by the late George Pace, UMC professor of English. Written in alternating Latin and Middle English, it has significance for textual research as well as for the history of western thought.

"The Consolation of Philosophy" (or "Boece," as Chaucer called his translation) is, in many ways, a bridge between the classical period and the Middle Ages. It brought into medieval thought such central classical concepts as the necessity for accepting whatever befalls man, which is characterized as Divine Providence.

A portion of the dialogue between Fortune and Providence may be seen in the exhibit of the Chaucer fragment open to the public in Ellis Library's Rare Book Room.

This & That

Travel authorization eased

As of Oct. 1, 1979, authorization from the Office of the President is no longer required for foreign travel. All foreign travel will be authorized in accordance with the requirements for domestic travel. The four chancellors, however, now have the authority to establish additional approval requirements at the campus level.

The decentralization was unanimously approved by the UM cabinet at its Sept. 27 meeting.

Internal Revenue Service regulations provide that all reimbursements for attendance at more than two foreign conventions, seminars, or similar meetings in a calendar year will be taxable income to the individual.

Credit union dividends up

The Missouri Employees Federal Credit Union has declared a 5½ percent annual dividend (previously 5%) on savings accounts for the six-month period ending June 30, 1979.

In addition to the dividend, members receive life insurance on their savings. The amount of insurance depends on the savings balance and the member's age at the time of deposit.

Share certificates are also available to credit union members. These time deposits are issued for periods of 12, 30, or 48 months, and pay interest rates of 6¾, 7, and 7¾ percent respectively.

Employees of the four UM campuses, and their immediate families, are eligible for credit union membership, as are employees of university-affiliated organizations, cooperating federal and state agencies, employees of the credit union, and employees of other designated organizations.

The credit union offers convenience to university employees interested in accumulating savings and taking out loans. Deposits to savings accounts and payments on loans may be arranged through payroll deduction.

The credit union is located at 909 University Ave. in Columbia, and is open from 9:30 a.m. to 3 p.m. Monday through Friday. The phone is 314-882-4073.

Cities' energy use studied

The UMR economics department was recently awarded a grant to research energy conservation in Rolla and three other Missouri towns—Hermann, Chillicothe, and

Kirkwood. All four have municipal utilities. The purpose of the grant is to provide training and establish an Energy Conversion Board in each city. These boards will act as technical advisors to provide information and suggest new ideas to governing bodies.

Review wins recognition

"The Missouri Review," literary magazine of the College of Arts and Science at UMC, has been recognized as one of the country's outstanding small presses by the Pushcart Prize Committee. Sponsor of the competition is the Pushcart Press, Yonkers, N.Y.

Also recognized was "The Ownership of the Night," a poem by the Review's co-editor, Larry Levis. Levis is associate professor of English and co-director of the UMC creative writing program.

The Prize volume "The Pushcart Prize IV: Best of the Small Presses," displays winning works from one of the country's major literary competitions. Sixty-one selections from 53 small presses were chosen from 4,000 nominations.

"The Missouri Review," founded by the English department in 1977, publishes international poetry, fiction and literary criticism three times a year. Its selections are primarily from unestablished writers, in an attempt to pioneer new literary talent.

Prof to edit new journal

Arrangements have been completed for publication of a new mathematical modelling journal which will be edited by Dr. Xavier J. R. Avula, professor of engineering mechanics at UMR, and Dr. Ervin Y. Rodin, professor of systems science and mathematics at Washington University, St. Louis.

The "International Journal of Mathematical Modelling" will be published quarterly by Pergamon Press. The first issue will be available in the spring of 1980.

Mathematical models, which are mathematical descriptions of systems or ordered patterns of arrangement, are used in a wide variety of fields. The new journal will use a 50-member editorial board with expertise in engineering, biological, environmental, social and behavioral sciences.

Dr. Avula has organized two recent international conferences on mathematical modelling and has edited or co-edited the proceedings of both. He found journals currently accepting papers on mathematical modelling to be overcrowded and slow.

"With the new journal, the lag time should be no more than three months."

Law school receives award

The UMC School of Law has received a \$10,000 Emil Gumpert Award for excellency in the teaching of trial advocacy. This award of the American College of Trial Lawyers is presented annually to two outstanding law schools. The other winner this year is the Loyola Law School in Los Angeles.

People

Anton Brasunas, director of the UMR graduate engineering center, presented lectures on metallurgy and corrosion at the International Conference on Failure Analysis in Mexico City recently. The conference was sponsored by the Mexican Institute for Petroleum.

William Walstad and Elaine Coulson, of the Center for Economic Education at UMSL, presented papers at the international meetings of the Joint Council on Economic Education and National Association of Affiliated Economic Education Directors in Toronto recently. Dr. Walstad's paper was entitled "The Impact of 'Trade-offs' and Teacher Training on Student Economic Understanding and Attitude." Ms. Coulson's paper was entitled "Combining Efforts for Successful Economic Education Inservice."

Ronald Arnatt, UMSL professor of music, has been selected as an ASCAP Award recipient this year by the American Society of Composers, Authors and Publishers. The award is granted by an independent panel and is based upon each individual's catalog of compositions. This is the 12th consecutive year that Dr. Arnatt has received this award for outstanding achievement in the field of choral and organ composition.

James Lampe, UMC associate professor of accountancy, has received one of the seven Price Waterhouse Foundation Auditing Professorships awarded nationally. The professorship, which provides a total of \$100,000 over a period of five years, will be used as a salary supplement and also will cover Dr. Lampe's research-related expenses.

Walter Keller, UMC professor emeritus of geology, has been honored with the Distinguished Member Award

from the Society of Mining Engineers. This award is reserved for those who have made outstanding contributions to the society's technological or professional activities.

John Sharp, UMC associate professor of geology, was chosen for the Geological Society of America's highest honor in the field of hydrogeology. Dr. Sharp's selection was based on a paper he co-authored titled, "Energy Transport in Thick Sequences of Compacting Sediment."

Farroll Wright, UMR associate professor of mathematics, has been elected a fellow of the 3,000-member Institute of Mathematical Statistics. Dr. Wright was chosen by the organization's governing body upon nomination from the group's committee on fellows.

Deborah Haimo, UMSL professor of mathematical science, recently served as a member of a team evaluating the science graduate program of Korea's Seoul National University.

Nancy Avakian, UMSL assistant vice chancellor for academic affairs, has been selected as one of 20 women in U.S. higher education to attend the American Council on Education's National Forum in Washington, D.C. this month. The purpose of the forum is to increase the recognition of women within higher education.

Hollis P. Leighly, UMR professor of metallurgical engineering, has been awarded a senior research fellowship by the British Science Research Council. Under the fellowship, Dr. Leighly will conduct research on defects in metals and alloys at the University of East Anglia in Norwich, England. His studies will include the use of a position annihilation spectroscopy, a new technique.

Jobs

The following administrative, professional, and academic vacancies were listed with *Spectrum* as of Oct. 25. Those interested in a position should contact the appropriate academic department or personnel office.

UMC: Administrative associate I; asst. director, public information (med. comm.); chemist; computer programmer/analyst; coordinator, employee relations; director, administrative computing services; engineer, Physical Plant; managers, campaign, parking operations; microbiologist; radio producer; director, campus computing services; research specialist; scientific programmer/analyst II; student services coordinator/counselor, handicapped student programs, minority student programs (3); supervisor, tv engineering; systems analyst; registered medical technologist; **UMca:** auditor; compensation specialist; computer project manager (2); executive staff assistant I; senior research chemist; senior systems analyst; senior systems programmer; systems programmer;

UMC Hospital: Asst. directors, nursing services (3), professional services; computer programmer analyst I, II; coordinator, staff development; director, nursing; head nurse (5); housekeeping supervisor; managers, computer center, management engineering, patient accounts, programming, systems design; nurse anesthetist; nurse practitioner; nurse recruiter; pharmacist (2); physical therapist; registered medical technologist; senior management engineer; senior computer programmer/analyst (3); senior systems analyst; staff nurse (54); systems analyst;

UMR: Professor and chairman, chemistry; health physicist; assistant, sport events;

UMKC: Admissions counselor; special services counselor; producer director;

UMSL: Dean, School of Optometry; head of instructional and research services division, university libraries; asst. professor, computer scientist, mathematical science.

SPECTRUM

is published every other week during the academic year and monthly during the summer session by University Information Services, 400 Lewis Hall, Columbia, in cooperation with the Columbia, Kansas City, Rolla and St. Louis Offices of Public Information.

Editor: Parker Buckles
Ph. 882-4591

