

# Herff Highlights



The University of Memphis

Herff College of Engineering

Fall 1998

## The Dean's Perspective



Dr. Richard C. Warder, Jr.,  
Professor and Dean

In many ways, *Herff Highlights* serves as an annual report of activities in the College. There is always the temptation to include 'everything'. The details of this message and the departmental and institute reports that follow are only a few of the engineering activities underway at The University of Memphis.

The College is well positioned to respond to opportunities for growth and development. Previous deans, department chairs and faculty made some good, if difficult, decisions regarding new directions and programs in the College. The University has a solid budgeting process in place so we are not in a management by crisis mode of operation—except when the State government suddenly mandates major budget reductions for higher education throughout Tennessee. These reductions adversely affect the operations of both The University of Memphis and the College and the education of our students.

Two areas have consumed a significant amount of the College's fiscal and personnel resources during the past two years. These are the accreditation visits by teams of the Accreditation Board for Engineering and Technology (ABET) and our student recruitment and retention efforts.

During the Spring and Fall 1997 semesters, many College faculty, staff and administrators devoted a major portion of their time to preparing for the visits by the Engineering Accreditation Commission (EAC) and by the Technology Accreditation Commission (TAC) of ABET. In September 1997 a team of visitors representing the EAC reviewed our civil, electrical and mechanical engineering programs and in November 1997, a TAC team reviewed our architectural, computer engineering, electronics engineering and manufacturing engineering technology programs. We received and responded to the written drafts of their findings in the Spring 1998. We were recently notified that the Col-

lege received accreditation from ABET for all seven of the programs, as we have for many years. There were no major surprises in their findings, although a number of issues such as sustained funding for undergraduate laboratory equipment, renovation of some laboratory space, and the need for competitive faculty salaries and for additional faculty and support staff were raised. This is the good news! However, major changes are occurring in the criteria used for accrediting programs and we have already begun preparing for these future visits. The new criteria, EC 2000, are optional now but become mandatory at the turn of the century. There is a need for the individual programs to identify their objectives and competitive position. This is turn will require new content in the programs. Our departments have made significant progress in the process of defining program objectives and beginning curriculum revisions. This is an ongoing process that will involve input from our students and industrial advisory boards.

We have continued our efforts to increase retention of our entering students using the special sections of Chemistry I and Calculus I for engineering freshmen described in last year's newsletter. These sections are taught by Arts & Sciences faculty who are recognized as consistently providing quality instruction. The College provides additional teaching assistants and tutoring for these sections. We assessed the effectiveness of these special sections during the Fall 1997 and Spring 1998 semesters. One major result was the desirability of determining the appropriate first mathematics course for entering freshmen. A Mathematics Placement Test was given during the first week of the Fall 1998 calculus and chemistry classes and this test will now be given during New Student Orientation with the results available to the academic advisor prior to registration for classes.

The College of Engineering has worked to develop ways to provide recognition and competitive compensation for our most productive faculty. The members of our Advisory Council have recognized this need and have responded most generously in providing funding for Engineering Professorships for selected faculty in the College. The Professorship appointments are for three-years and are renewable subject to the continued productivity of the faculty and the availability of funds. Details of the initial set of appointments are given later in the newsletter.

The University Undergraduate Curriculum Committee has approved the electrical engineering department's pro-

posal to establish an undergraduate degree program in computer engineering. This program was developed in direct response to the needs of industry and the growing importance of computers and digital systems in all aspects of technology and society. After completing campus approval, the proposal will be forwarded to the Tennessee Board of Regents for their approval and then to the Tennessee Higher Education Commission for final approval.

The Provost has appointed a committee to explore the transfer of the architectural technology concentration in engineering technology to the College of Communication and Fine Arts (CFA). The committee will consider issues such as curriculum changes, degree designations, accreditation, the availability of space for current needs in CFA and additional space for architectural technology. The committee is to submit its recommendations in early April.

The College is beginning another trend. Throughout the profession, an entire generation of engineering faculty who joined the departments in the post-Sputnik era is approaching retirement. This can be cause for nostalgic regret for those many students they have taught. Over the next several years, we will be recruiting for a number of faculty positions. Attracting innovative, motivated individuals who will develop quality instructional and research programs is a special process. However, it also is one of the most rewarding for faculty who would like to see their shoes filled by contemporary versions of their younger selves. This year, the College has current and anticipated open positions in both engineering and engineering technology. These openings are in Civil Engineering, Electrical Engineering, Industrial & Systems Engineering, Computer Engineering Technology, Manufacturing Engineering Technology and a Director of Recruiting and Retention. Position requirements and the application procedures are given on the College Web-page: <http://www.people.memphis.edu/~herffcoll>. If you know of someone who would be a potential candidate, please encourage them to apply.

The changes and opportunities we face are challenging. I am proud of the way our students, staff and faculty are responding. I appreciate the loyal alumni, friends and supporters who are making opportunities possible and helping us respond to change.

Besides reports from around the College and your Alumni Association, our new Engineering Professorships and several personnel changes are described below and your responses to our request for news about your families and careers are included. Please keep us informed by returning the form on the last page by fax, surface mail or e-mail.

## Engineering Professorships

The first group of Engineering Professorships was announced at the Engineering Alumni Association reception held at the Pyramid on November 19, 1998. Michael Daley of Electrical Engineering and Gladius Lewis of Mechanical Engineering have been appointed Ballard Professors. These two professorships are supported by the Ballard Endowment established by Mac and Tish Ballard. Mr. Ballard is the former CEO of Shelby-Skipwith. Charles Camp of Civil Engineering has been appointed as the first Robert E. Wharton Pro-

fessor of Engineering. This appointment recognizes innovations in undergraduate education and was established by G & W Diesel in honor of its founder, the father of Bobby Wharton, a member of the College Advisory Council. Fritz Claydon of Biomedical Engineering was appointed the ECI Professor of Engineering. This professorship was established by Stephen Olita, President of Electronic Controls, Inc. of Collierville, TN. Steve is a member of our Advisory Council. Marty Lipinski, Chairman of Civil Engineering has been appointed the Ensafe Professor of Engineering. This professorship was established by Ensafe, Inc. through the efforts of Dr. James Speakman, Senior Vice President of Ensafe who also is a member of the College Advisory Council. Shahram Pezeshk of Civil Engineering has been appointed the first Don P. Smith Professor of Engineering. This professorship honor's Smith, a former CEO of the Pickering Firm, and was established by Joe Emison, current CEO of Pickering and a member of the College Advisory Council.

## Changes

In every dynamic College of Engineering, personnel changes are continual. Senior faculty retire, new faculty arrive, and adjunct faculty come and go. Our College is undergoing some changes.

**John Smith** of Civil Engineering has served as Director of the Ground Water Institute (GWI) since it was established in November 1991. Dr. Smith is retiring from the University at the end of the Fall 1998 semester after 28 years of service. His leadership of the GWI and his contributions to the Civil Engineering Department, the College and the University will be greatly missed. **Jerry Anderson** of Civil Engineering, who previously served as Associate Director of the GWI, has been appointed Director of the GWI.

**Michael Neuman** has been appointed a Herff Chair of Excellence in Biomedical Engineering. Dr. Neuman received his B.S., M.S., and Ph.D. degrees from Case Institute of Technology. He received his MD. degree from the Case Western Reserve University School of Medicine in 1974. He had served on the faculty of Case Western Reserve University since 1966 until joining The University of Memphis...**John Hochstein** was appointed Chair of the Department of Mechanical Engineering effective June 1998...**Houshang Javan** has been appointed an Assistant Professor of Engineering Technology with primary teaching responsibilities in the Electronics Engineering Technology program. Dr. Javan received his doctorate in Electrical Engineering from Washington University...**Hichem Frigui** has been appointed an Assistant Professor of Electrical Engineering. Dr. Frigui received his Ph.D. from the University of Missouri-Columbia in Computer Engineering and has extensive experience in computer vision and image processing...**Gary Qi** has been appointed Assistant Professor of Mechanical Engineering. He received his Ph.D. from the Texas Tech and was employed by Weber Aircraft in Gainesville TX, prior to joining the College. His research interests include acoustic emission and ultrasonic nondestructive evaluation and reliability design for manufacturing...**Carl Williams** has been appointed an Assistant Professor with primary teaching responsibilities in the Manufacturing Engineering Technology program. He

has B.S. degrees in Industrial Engineering and Business Management from Mississippi State University, an M.B.A. from The University of Memphis, and is a registered professional engineer and certified manufacturing engineer.

Promotion and tenure decisions approved effective September 1998 were: **Russell Deaton** to Associate Professor of Electrical Engineering with tenure; **Robert Douglas** to Associate Professor of Engineering Technology; **Deborah Hochstein** to Associate Professor of Engineering Technology with tenure; and **Larry Moore** to Professor of Civil Engineering.

## Benny O. Lendermon III named Outstanding Engineering Alumnus

Benny Lendermon, Director of Public Works for the City of Memphis since 1988, was selected to receive the 1998 Outstanding Alumnus Award from the College Alumni Chapter. The award was presented at the Tenth Engineering Alumni Awards Dinner, held March 26, 1998.

Lendermon earned his B.S. in civil engineering in 1975 and his M.S. in environmental engineering in 1979. As senior official in charge of the Public Works department for the 15th largest city in the United States, he oversees design, construction, maintenance and operation of streets, sewers, wastewater treatment facilities, flood control facilities, vehicle emissions testing, Superfund/hazardous waste sites and solid waste collection and disposal. The division has 1,500 employees with an annual operating budget of \$70 million.

Benny joined the division in 1975 as an environmental project engineer. He is married to the former Allison Price and has twin daughters, Karen and Beth.



*Benny Lendermon with Engineering Alumni Board President Monique Graf-Castellaw.*

## BIOMEDICAL ENGINEERING

### Departmental News

The first Tennessee Conference on Biomedical Engineering (TCBE) "Engineering the Future of Healthcare in Tennessee." was held in April 1998. The conference was hosted jointly with the School of Biomedical Engineering at the

University of Tennessee. This conference was developed to foster collaborative efforts among industrial, academic, and clinical institutions that are involved in biomedical engineering and to increase the awareness of biomedical engineering related activities in Tennessee and surrounding states.

### Student Activities

**R. Aamotsbakken** has accepted a position as Process Development Associate with Powderject Vaccines, Inc. in Madison, WI...**V. Narasimhan** has taken a Software Engineer position with the Brady Division of Medtronic, Inc. in Minneapolis...**S. Peckham** has accepted a position as Biological Research Associate with Sofamor Danek. in Memphis...**V. Balasubramanian** has a paper in press in the Journal of Biomedical Materials Research entitled "Residence-time dependent changes in fibrinogen adsorbed to polymeric biomaterials"...**J. Blackwell** presented "Ligand coated microsphere and nanosphere adhesion to E-selectin" at the Fall Biomedical Engineering Society Meeting...**P. Chen** presented "A fast feature point correspondence algorithm based on Alpha-Beta-Gamma filter and directional coherence function" at the first TCBE...**W. Hua** presented "Model study of high spatial density electrode arrays on cardiac tissue" at the first TCBE...**H. Li** presented "A scalable and shiftable Bayesian defibrillation estimator" at the First Tennessee Biomedical Engineering Conference. She has taken an engineer position at Cardiac Pacemakers Inc. in St. Paul, MN...**T. Losicco** presented "Design of an optical FRET system for transmembrane potential measurements" and **C. Rowan** (Summer REU undergraduate engineering student) presented "Initiation of fibrillation by t-wave stimulation: a model study" at the Computers in Cardiology meeting...**Qiuju Huang** has a paper in press in the IEEE Transactions BME entitled "Transmembrane potentials of the heart induced by defibrillation fields: A 3-D finite element bidomain/monodomain torso model." **Emilia Entcheva** published "Virtual electrode effects in transvenous defibrillation - modulation by structure and interface: Evidence from bidomain calculations and optical mapping" in the J. Cardiovascular Electrophysiology. **Amy de Jongh** presented "Optimizing electrode placement in a proposed ICD system incorporating LV electrodes: finite element analysis" at the Computers in Cardiology meeting. She also presented "Defibrillation efficacy of different electrode placements in a human thorax model" at Cardiosim in Nice, France, 1998. She presented "Locating weak potential gradient fields during transvenous defibrillation in a human thorax model" at the North American Society of Pacing and Electrophysiology Meeting in San Diego. **M. Roy** has a paper in the J. Biomedical Materials Research entitled "Mechanical and morphological variation of the human lumbar vertebral cortical and trabecular bone." **Constance Hall's** paper entitled "Factor Xa generation at the surface of cultured rat vascular smooth muscle cells in an in vitro flow system" appeared in the J. Biomechanical Engineering. **Wei Huang** has had a paper entitled "Comparison of theory and experiment in pulsatile flow in cat lung" published in the Annals of the Biomedical Engineering Society. He also has had the paper entitled "Zero-stress states of human pulmonary arteries and

veins published in the Journal of Applied Physiology. **J. Gao** presented "Strip biaxial experiment of human lung parenchyma" at the Winter Annual Meeting of the American Society of Mechanical Engineers.

## Faculty Highlights

**Douglas Goetz** presented "Mac-1 Microsphere Adhesion to E-selectin" at the Fall Biomedical Engineering Society Meeting in Cleveland and "Mac-1 microsphere adhesion to E-selectin under flow" at the Vascular Cell Biology at a Gordon Research Conference. He also presented at a seminar at the University of Missouri-Columbia on "Isolated Leukocyte ligand adhesion to E- and P-selectin." He co-chaired the Cancer Cells and the Microvasculature session at the BMES Meeting...**Robert Malkin** received the 1998 IEEE-Memphis section Outstanding Service award. He is the current chairman of IEEE/EMBS-Memphis section and will serve as chair of the 2002 Computers in Cardiology International Conference...**Michael Neuman** presented an invited lecture entitled "Important Issues in Biomedical Sensor Development" at the Biomedical Engineering Consortium of Connecticut Symposium on Biosensors. He presented two papers at the Fall Meeting of the Biomedical Engineering Society entitled "Sensing the human body: Biosensor development at Case Western Reserve University" and "Microfabricated sensors for diamines and diamine oxidase for application in reproductive medicine." Dr. Neuman also chaired the Microfabricated Sensors session at the BMES meeting. He participated in the National Science Foundation-Whitaker Foundation Workshop for Principal Investigators in the Research on Cost-reducing Biomedical Technologies Program in Washington, D.C. He attended an Editorial Board meeting for the Physiological Measurements journal in London. He was a member of the National Institutes of Health Special Study Section reviewing applications for grants on glucose sensors, Washington, D.C...**Lloyd Partridge** presented "Biological set-point a myth with serious consequences" at the FASEB meeting. He also presented a Holladay Park Medical Center Research Seminar entitled "Control in biological systems" at the Legacy Research Institute...**Jae Rho** chaired a session at the 11th conference of the European Society of Biomechanics, Toulouse, France, and presented two papers entitled "Elastic properties of osteon and trabecular bone measured by nanoindentation" and "A generalized bone loss involving all bones of the skeleton among the elderly people." He presented an invited lecture entitled "Elastic properties of cortical and cancellous lamellar bone" at the University of Texas Health Science Center at San Antonio...**Steven Slack** chaired a symposium entitled "Proteins and Cells at Interfaces" at the Fall Biomedical Engineering Society Meeting. He presented "Characterization of conformational states of soluble and adsorbed platelet GP IIb-IIIa" at the 7th Annual Midwest Platelet Conference...**Vincent Turitto** chaired a session at the Fall Biomedical Engineering Society meeting. Dr. Turitto is Chair of the Publications Board for the BMES Annals also. He co-chaired the Platelet Inhibitors and Mechanisms of Thrombosis session at the Seventh Annual Midwest Platelet Conference in Memphis...**Michael Yen** attended a National Health Research

Institute Review Committee and Council Meeting, Taipei, Taiwan...

## Grants Awarded

**Douglas Goetz** was awarded a \$210,000 CAREER grant from the National Science Foundation entitled "Biophysical analysis of adhesion molecule coated microspheres". Faculty Early Career Development grants help promising young scientists and engineers develop contributions to research and education. He also received a \$60,000 grant from the American Heart Association entitled "Generation and characterization of model drug delivery carriers which target select segments of the endothelium"...**Robert Malkin** received a \$300,000 Established Investigator Award from the American Heart Association entitled "Modelling defibrillation in rodents, including waveform optimization"...**Michael Neuman** received a \$1,000,000 Special Opportunity grant from the Whitaker Foundation entitled "Focusing the Memphis effort in pediatric biomedical engineering"...**Jae Rho** has received a \$94,910 AREA grant from the National Institutes of Health entitled "Age related lamellar bone property changes". He was awarded a Summer Faculty Fellowship from the Oak Ridge National Laboratory to conduct research on ultrastructural bone mechanical properties using nanoindentation...**Steven Slack** received a \$16,000 grant from Hearten Medical to carry out hemocompatibility testing of modified vascular prosthesis materials...**Vincent Turitto** has received a \$69,911 AREA grant from the National Institutes of Health entitled "Tissue factor activation of Factor X mediated by flow"...**Michael Yen** received an additional \$70,000 from General Motors for his project on "Mechanical Properties of Human Heart, Lung, Airway, Diaphragm and Liver for Highway Safety Research"...

## Research Experiences for Undergraduates (REU) Program

The REU in Bioengineering and Biosurfaces program funded by the National Science Foundation supported 20 undergraduate students from various universities across the United States. Each student spent a 10-week period working on a biomedical project with faculty from the Joint Program in Biomedical Engineering, other engineering departments, and several departments in the College of Arts and Sciences. The Joint Program faculty members involved in this effort are Vincent Turitto, Steven Slack, Doug Goetz, Mike Neuman, Jae Rho, Fritz Claydon and Mike Yen.

## CIVIL ENGINEERING

### Faculty News and Notes

The second edition of **William Segui's** textbook, *LRFD Steel Design*, has been published by PWS Publishing Company... **Roger Meier** was elected President of the West Tennessee Branch of the ASCE. He is currently developing generic algorithms for calibrating water distribution system models and is collaborating with researchers at University of Tennessee to help TDOT design better asphalt pavements.

Dr. Meier is also developing a new graduate course in soil improvement methods to help Memphis-area geotechnical engineers design foundations to be built atop non-engineered fills...**Martin Lipinski** recently completed a one-year term as chairman of the ASCE Highway Division and has been re-elected to the Board of Directors of the Memphis Uniport Association. He recently published *Road Safety Audits—A Report of an International Federal Highway Administration Study Tour* and moderated a session on School Safety Issues at the Institute of Transportation Engineers annual meeting in Toronto. **Larry Moore** was recently elected Vice President of the Kentucky-Tennessee Water Environment Association. He continues to help Tennessee industries solve their environmental problems through the Tennessee Manufacturing Extension Program...**Roger Smith** spent the summer developing and conducting technical reviews of hydrologic forecast models for the Corps of Engineers Memphis District. He has been elected to serve on a new ASCE Task Committee on Cohesive and Non-Cohesive Sediment Movement in Storm Drains.

## Student Organization News

Last year was one of the best in recent years for the **ASCE Student Chapter**. Our students finished third out of 22 schools at the 1998 ASCE Southeast Regional Student Conference. They brought home a first-place trophy in the Concrete Strength competition, with a winning average of 33,000 psi. That strength was twice as high as that of the second-place team! The students also brought home second-place trophies in the T-Shirt Design and Environmental competitions and a third-place trophy in the Balsawood Bridge competition.

In addition to their stellar performance at the Conference, our Student Chapter was given an Outstanding Community Service award by the President of ASCE, Luther Graef. This award, one of eight presented nationally, was partly based on the Chapter's efforts last year to help **The Groundwater Institute** develop a comprehensive GIS database for Elmwood Cemetery. Their involvement included a detailed survey of all the roads, trees, and gravesites in the cemetery, which has been in continuous operation since 1852. The completed GIS system will benefit the hundreds of genealogists and history buffs who visit the cemetery each year and will allow Elmwood to develop a comprehensive tree maintenance program.

This year, the Chapter is undertaking a service project on behalf of Shelby-Meeman State Forest. Their efforts will include a photographic survey of erosion damage to the hiking trails and recommendations for alleviating the most severe problems. Next year, the Chapter hopes to be involved in the implementation of one or more of those recommendations.

## Professional Development Program Continues

The Department will again provide continuing education courses in partnership with the West Tennessee Branch of the ASCE. These courses provide engineers in the region

opportunities to develop their skills and to earn the professional development credits needed to maintain their licenses. This spring, **Dr. Shahram Pezeshk** will teach "Earthquake Design of Building Structures" and next fall, he and **Dr. William Segui** are scheduled to teach "LRFD Steel Design for Practicing Engineers"...

## ELECTRICAL ENGINEERING

### Department News

The department has proposed to establish an undergraduate degree program in computer engineering. The proposal will result in a two-track program in the department. This will include a common first year curriculum. Thereafter, students could choose to follow a track leading to the current BSEE or one leading to a bachelor's degree in Computer Engineering. The faculty is excited about the opportunity that this proposal represents and looks forward to serving our constituents better. We anticipate that the department will evolve into a Computer and Electrical Engineering department as early as the Fall semester of 1999.

The faculty have continued their research work with national and international impact. **Mike Daley** is continuing his work on the dynamics of intracranial pressure and cerebral venous drainage funded by the National Institutes of Health. In association with faculty from Civil Engineering, **Russell Deaton** continues work on a Tennessee Department of Transportation on the Detection of Bridge Scour by Thermal Variation project. He is also the principal investigator on "Analysis and Simulation of Wireless Communication" funded by a prominent package delivery company in the mid-south area...**Babajide Familoni** is continuing to conduct research into electrical stimulation as a treatment for refractory gastroparesis. The work is currently supported by a grant from the National Institutes of Health. In the same area of research, the U.S. Patent office granted a patent for on-demand gastric stimulators...**David Russomanno** is working on Intelligent Data Conversion which continues to be supported by grants from *Apex Data Services* and *Intergraph Corporation*...**Timothy Wilson** secured an Air Force Research Lab project on Automated Aural Analysis funded through *QuesTech* and *Rome Labs*...

### U of M-EE 2000

In 1995, the department established an endowment fund—the U of M-EE 2000 fund. This fund is designed to provide the department with flexibility in meeting the daily challenges of running a department in the face of dwindling State funding. One semester, the need might be a specific piece of equipment, while it might be graduate student support, or new faculty start-up funds in another semester. The goal is to raise \$50,000 by December 31, 2000.

The diminished state funding of higher education programs does not permit us to keep pace with our goals and needs. Maintaining the quality of our programs can be realized with the help of our alumni and friends. We encourage you to become a donor to the U of M-EE2000.

### Faculty News and Notes

"A wayside inspection station," a paper about a microprocessor-based system developed for the Rock Island Railroad, was published by **Dean Smith** in the ASME / IEEE Joint Railroad Conference...**Scott Southall** and Dean Smith wrote "Revising Pulse and Digital Circuit Laboratory Exercises-A Progress Report," for the March 1998 ASEE-Gulf Southwest Conference...**Robert Douglas** and Dean Smith published another paper, "Revising Assembly Language Laboratory Exercises—A Progress Report" in the conference proceedings...Dean Smith received one of the 1998 New Faculty Research Initiation Awards program funded jointly by the Vice-Provost for Research and the Dean of Engineering. Dr. Smith and graduate students, from Electrical Engineering and Engineering Technology, developed software that will automate the testing of computer systems using signature analysis. Dr. Smith also secured a gift of \$6490 of design software and development boards from the Altera Corporation. The software supports the development of Programmable Logic Devices (PLDs), and the hardware permits the results of the software to be tested...Engineering Technology is adding TECH 7993, Internship in Engineering Technology, as an elective in the Masters program. A student can earn up to 6 hours credit while completing a previously approved, supervised internship in industry...The department has proposed a new M.S. concentration in Computer Engineering Technology that will permit students to take four electives from a list of courses that cover computer hardware, programming, or computer hardware and software. The change was made in response to requests from both students and their employers. As a consequence of this new program, the sequence of software courses in place must be revised. Java replaces Pascal as the programming language for the program. Assembly language programming is being dropped as a required course, but much of the material is being incorporated into the microprocessor and computer interfacing courses. Internet Technology and Computer Network Technology are new electives in the undergraduate Computer Engineering Technology program. An elective slot is being created by making Assembly Language Programming an elective, and incorporating some of its material in existing courses. Data communications is being removed from the Operating Systems courses. The changes will make it easier to transfer into the program from two year (Associate degree) Technology programs, and adjusts the program to accommodate new technology.

### Embedded System Development Laboratory

Part of an existing course is being converted to an Embedded Systems Development Laboratory with the aid of Technology Access Fee funds and support from Altera Corporation. Eight Pentium-based personal computers had their memory doubled so that they could run Windows NT Workstation. Eight more Pentium-based personal computers run-

ning Windows NT were installed. Microsoft MASM 6.0 and Microsoft Virtual C++ are available over the network to develop software for embedded systems. Altera Max+Plus II software can be used to program PLDs. CAD Software, such as Electronic Workbench and SPICE, will be added. Microcomputer Corporation MicroLab Trainers are being installed to support the development of dedicated computer systems. Assemblers and single-board development systems for the Motorola 68HC11 systems are also available. Other development and test tools will be added as more funds become available. Both Electrical Engineering and Engineering Technology use the laboratory for project and thesis classes, and for classes supporting the development of embedded system hardware and software.

### Professor Robert E. Magowan Scholarship Fund

Friends and colleagues of **Dr. Robert (Bob) Magowan** have established an endowed scholarship fund to honor his 30 years of dedicated service to his students and the Department. The purpose of the endowed scholarship will be to provide future students with financial support, and it will serve as a lasting tribute to Dr. Magowan. The goal is to raise \$25,000 within three years. Alumni wanting to contribute may send a tax deductible check to The University of Memphis Foundation, Memphis, Tennessee, 38152, in care of the Robert E. Magowan Endowed Scholarship Fund. Persons considering the donation of appreciated securities may contact Kevin Roper, Vice President for Marketing and Development for the University at (901) 678-4438.

### Manufacturing Engineering Technology SME Grant

The Society of Manufacturing Engineers (SME) Education Foundation has awarded a grant to the Manufacturing Engineering Technology program. The 1998 grant award is for \$164,039. To date the Manufacturing Engineering Technology program has received over \$1.8 million dollars from the SME Education Foundation...The proposal, written by **Scott Southall** and **Deborah Hochstein**, awarded funds for the purchase of new equipment for the Manufacturing Processes Laboratory. The grant also provides software gifts and funding for curriculum development, faculty development, and the purchase of library materials and instructional video tapes...These grants have allowed the Manufacturing Engineering Technology program to keep on the cutting edge of technology.

### Tim Motch Receives Awards

Spring 1998 Engineering Technology graduate **Timothy Motsch** received two distinguished awards. Tim received the Dean's Award for having the highest grade point average in the College and the faculty selected him as the 1997-98 Outstanding Engineering Technology Senior. Both awards are indicative of his exemplary academic achievement. The awards were bestowed during The University of Memphis Honors Assembly held during April 1998. Upon graduation, Tim was commissioned as an Ensign in the United States

Navy. He is currently stationed at the Surface Warfare Officers School in Newport, Rhode Island.

## Renewed Articulation Agreement

The Engineering Technology programs and State Technical Institute of Memphis (STIM) are in the process of renewing their articulation agreement that spells out the transferability of courses from STIM. The current agreement provides a 2 + 2 arrangement in which graduates of STIM's two-year Engineering Technology programs may transfer to The University of Memphis with junior status, and credit for up to four of the eight semesters required to earn the Bachelor of Science in Engineering Technology degree.

## Technology Training Center Serves the Mid-South

The Technology Training Center continues to serve the needs of the Mid-South by offering beginning, intermediate, and advanced courses covering a wide variety of Autodesk software products. **David Minkin**, Director of the Center, notes that courses may be customized to suit individual or company needs. The Center utilizes the most recent releases in software and class enrollments are kept small so that individual instruction can be provided. For further information regarding course offerings contact David Minkin at 678-2225 or [dcminkin@memphis.edu](mailto:dcminkin@memphis.edu).

## GROUND WATER INSTITUTE

The Ground Water Institute (GWI) has been involved in activities that have focused on increasing our understanding of the local aquifer system and providing Geographic Information System (GIS) expertise to the academic and professional community.

This year, two students have completed work under the support of GWI toward graduate degrees in Civil Engineering. **Randy Gentry** completed his Ph.D. degree in Civil Engineering with a dissertation entitled "The Development of a Genetic Algorithm Technique to Solve the Inverse Ground Water Problem Associated with Accretion to a Semi-confined Aquifer." Randy will remain at GWI this next year in a post doctoral position...**Rodney Conger** completed his M.S. with a thesis entitled "A Genetic Algorithm for the Maximal Covering Location Problem." Rodney will also remain at GWI this next year as a Research Associate...In addition, **Jennifer Redden** was the main contact person for all work done for the Tennessee Department of Environment and Conservation. Jennifer has accepted a position with the Corps of Engineers beginning January 1999.

This GWI continues to be involved in a cooperative grant with the Institute for Rare Isotope Measurements at the University of Tennessee to verify the use of Kry-85 as an age-dating technique for ground water. In addition, GWI and the Department of Geological Sciences will be collecting samples and verifying several age-dating techniques such as, tritium and He-3 and Kry-85, with ground water chemis-

try analyses to analyze details of modern water that may be entering the Memphis Sand aquifer.

Early work at GWI required the development of a GIS database to store geologic and other cross-disciplinary georeferenced data. As a result, GWI has offered its GIS expertise to the Tennessee Department of Conservation and Environment (TDEC), Corps of Engineers, the City of Memphis and Shelby County government in order to develop regional GIS resources. This year GWI also began planning efforts at making GIS software and databases available to The University of Memphis academic community. In addition, GWI offered ArcView training to TDEC and will continue in the years to come.

In the following year GWI will continue to refine the communities understanding of the local aquifer systems by numerical modeling and fieldwork. Also, GWI will continue as an active GIS supporter and developer in the academic community.

## INDUSTRIAL AND SYSTEMS ENGINEERING

### Faculty News and Notes

The Industrial and Systems Engineering Program is in the 3rd year of its undergraduate program. The first graduate of the program, Talaat Khmous, will finish this December...**Robin Lovgren** and **Michael Racer** have been busy in classroom experimentation. A joint effort in the Spring 98 semester linked Dr. Lovgren's graduate statistics students with Dr. Racer's undergraduate statistics students. While the focus was initially on the use of team projects to increase statistical knowledge, it was also readily apparent that the students could benefit from the experience of working with, and thinking about, group dynamics. This effort was presented at the spring INFORMS Conference...This fall, Lovgren and Racer have initiated a set of self-paced INSE courses. In addition to having the students focus on their own learning processes, the course also offers the opportunities for the students to interact with other students, including the students in other classes. The ultimate goals are: to encourage the students to be better self-motivated learners; to develop a set of websites for the classes; and to show the students how the various courses inter-relate. The impetus for this concept was the recent ABET 2000 initiative, which identifies life-long learning and critical thinking as two of its major objectives...The faculty in INSE have also been working to develop various relationships with the community. Dr. Racer has visited a number of high schools in the area, to inform students, faculty and counselors of the opportunities available in INSE. The INSE faculty have visited with a number of local companies—FedEx, Logistics Management Inc., Mueller, and American Greetings—to establish stronger working relationships with INSE. More on this, and a proposed internship program, will be in the next newsletter...Dr. Lovgren and Dr. Racer recently presented three papers at a conference in Seattle. Their work focused on an application to operations at the Memphis FedEx hub and line balancing in a manufacturing environment. The

INSE faculty are also involved in modernizing their courses—this semester they are offering a series of self-paced, web-based courses. They are also continuing to explore the usefulness of projects in teaching statistical methods to civil engineers.

## MECHANICAL ENGINEERING

### Departmental News

Rather than briefly touch on all of our activities, a more in-depth report on one of our endeavors seemed desirable, and what could be more important to our alumni and students than our undergraduate curriculum review and enhancement project. You may recall that our department's contribution to the previous edition of *Herff Highlights* concluded with several questions e.g., What knowledge and skills will our graduates require to succeed in the highly competitive global marketplace in which engineering is now practiced? Following last fall's review of the undergraduate Mechanical Engineering Program by ABET, the faculty decided it was time for a major review of the program. Although minor modifications have occurred with regularity over the years, the program has not undergone a substantial change since the mid 1980s. ABET is phasing-in a new set of criteria, known as EC2000, that significantly change the basis for program evaluation. To oversimplify the change, the new criteria are far more focused on the processes by which department objectives are achieved whereas the previous criteria were more focused on defining specific curricular content. This is clearly a good time to evaluate the existing program, begin implementation of changes if the review concludes they are warranted, document existing program development processes in a form to suitable for EC 2000 evaluation, and begin implementation of new processes that will support continuous program improvement.

Last spring, several meetings were held by our faculty with the sole purpose of assessing the current state of the undergraduate program and creating a plan for a detailed comprehensive review. It was decided that a first step would be to determine what are the minimum capabilities, or competencies, that a degree candidate in Mechanical Engineering should possess before they are awarded that degree. Faculty committees have been formed to develop a list of such capabilities and the department faculty will review and refine the competency list using stated departmental objectives as the main evaluation criteria. Once the list of capabilities has been established, design of the system for delivering instruction for the purpose of developing these capabilities in our graduates will undertaken.

Generation of the competency list is viewed as the start of the program content definition process. It is hoped that all parties with an interest in the process will take an active role in developing the list of capabilities expected of all our program graduates. An Industrial Advisory Board will be formed to provide input to this process. We will ask current students for input to the process and we will ask you, our alumni, for input. No one is more familiar with the program we have delivered to our students in the past and therefore

you are in a unique position to provide feedback on how the program prepares our graduates for professional practice.

All of this input will require channels for communication. The traditional communication modes are still effective. As computer-based electronic communications have matured, many of us have discovered the convenience afforded by e-mail. Over the past several years we have developed a department web site as a low cost way to provide nearly instantaneous dissemination of information. In addition to supporting coursework, our web site, (<http://www.me.memphis.edu/>), hosts web-pages for student and professional sections of engineering societies. You are invited to poke around in the web site and see what our department is up to. A portion of the site will be devoted to keeping our alumni abreast of all department activities including our curriculum development project and we hope it will provide an effective mechanism for communicating with you.

Using the department web site as a communication tool brings the discussion full-circle to our curriculum development project. We are in the initial stages of the process and would like to maximize your involvement in the process. From time to time we will solicit specific input from you and we appreciate the time and effort you invest in preparing your responses. But don't wait for us; be proactive! Let us know what you think of the web site. Volunteer to be involved in processes already underway and new processes being established to ensure continuous improvement of the department and thereby better serve our students and our alumni. Let us know what you think of the processes and the outcomes from the processes. Let us know of opportunities for improving what we do and how we do it. It is only by combining the best ideas of us all, (alumni, students, and faculty), that we can continue the growth and development our department.

### Student Organizations

Three professional engineering societies, ASME, SAE, and AIAA, have active student groups and it appears that our ASHRAE group may become active. Over the past year our student section of ASME has sponsored and participated in many events. Last spring the section made a very strong showing at the regional student conference; taking first place in the poster contest, winning the award for best technical content in the oral competition, participating on the winning impromptu design team, and winning the award for most improved section. ASME student members "gave back" to the community by contributing their time and effort to a **Habitat for Humanity** project and to the **Ronald McDonald House**. The AIAA student branch kicked-off the Fall 98 semester with a trip to Forrest City, Arkansas, to experience unpowered flight in gliders. Plans to present papers at the regional student conference next spring are underway and several programs have been co-sponsored with ASME including a trip to the Space and Rocket Center in Huntsville. The SAE student club continues to work on our entry for the SAE Mini-Indy competition. A fiberglass shell covers the frame and the vehicle is powered by a supercharged modified 600 cm<sup>3</sup> motorcycle engine that is connected to the drive wheels through an variable-ratio snowmobile transmission.

This project was made possible by the very generous financial support of alumni and local industry and we have high hopes for very successful participation in the national competition in May 1999. The Memphis ASHRAE section has donated \$1000 for students in the Design of Fluid Thermal Systems course to use to build models of their designs. The funds are allocated to two groups. One group will be constructing a model of an amusement park water slide, and another group will be building a full sized bicycle dynamometer. This latter project is receiving support from other local industries as well, including Dover Elevator, and the Murray Bicycle Company.

## Faculty News and Notes

Because each generation of computer chips seems to pose a greater thermal design challenge, **Srikant Gir** is working with graduate students to study novel heat sink devices... **John Hochstein** recently teamed with Boeing to win a NASA contract to study liquid-gas separation for life support systems on Space Station and served as 1997-98 Chair of the AIAA Microgravity and Space Processes Technical Committee... **William Janna** continues his activities with the American Society for Engineering Education, serving as Paper Reviews Chair for the Mechanical Engineering Division. He also serves as editor for the Internet publication *Mechanical Engineering News*. He recently published a paper on heat transfer to melting ice spheres and is preparing the second edition of his text on *Engineering Heat Transfer*. **Gladius Lewis** has been studying the relationship between the fracture toughness and impact strength of acrylic bone cement and has been using both experiments and computational simulation to study stress at articulating surfaces in hip and knee implants... **Ed Lin** presented a paper entitled "Using Dynamic Analysis for Compact Gear Design" at the 1998 ASME Design Technical Conference and continues to perform externally funded research in finite element analysis and optimum design of helical gear transmissions. This fall he assumed the position of *Director of Engineering Technical Support* for the college and there is still debate over whether congratulations or condolences are in order... **Jiada Mo** continues his study of fundamental fluid phenomena and their application to problems such as film cooling of aerospace engines. He presented "On The Vortex, Vortex Generation and Its Applications" at the Tennessee Academy of Science and plans to apply the knowledge he gained during that study to a very novel concept; tornado disruption using a surface-to-air missile... **Ed Perry** is leading the department's efforts to revise its freshman curriculum. These revisions include introducing students to Visual Basic, (instead of FORTRAN), an introduction to mechanical drawing, an introduction to the design process, and introductions to several other topics selected to enhance student academic skills and nurture their interest in Mechanical Engineering... **John Ray** continues his collaboration with a local industrial partner to study the impact loading of the human foot during a normal walk. He is using finite element analysis to determine the transmissibility of impact forces to the lower extremities and is preparing papers for presentation at the upcoming Southern Biomedical Engineering Conference and

the 1999 ASME Bioengineering Conference... **Teong Tan** recently participated in an NSF sponsored workshop on axiomatic design and continues his research in kinematics and mechanical design. He also recently participated in the first ABET Regional Faculty Workshop in Atlanta to prepare faculty for accreditation evaluations under the new criteria and is working on an analytical and experimental study of valve spring dynamics in high-performance V-8 engines... **Samuel Thomason** has introduced software developed by NASA for simulation of high-speed compressible flows into the senior Gas Dynamics elective course and is preparing a presentation for the 1999 ASEE Annual Summer Meeting on these activities...

## ENGINEERING ALUMNI

### Alumni Chapter

It is an honor and a privilege for me to serve as the 1998-99 President of the Board of Directors for the Engineering Alumni Chapter of The University of Memphis Alumni Association. The purpose of the Chapter is to strengthen the relationship between the engineering alumni and the various disciplines within the Herff College of Engineering in order to effectively support the priorities of the University and the College. The Board of Directors is the governing and planning body for the Chapter. Any graduate or former student of the U of M Herff College of Engineering is eligible to hold membership in the Chapter... Although participation on the Board requires only 15-20 hours per year, it provides a valuable opportunity to interact with other engineering alumni and community leaders, and to actively support your College and University. I would like to take this opportunity to encourage you to become involved by attending the Chapter-sponsored events, joining the Board of Directors, providing financial support, or sharing your ideas on how we can best serve the alumni, students and faculty of the College. If you are interested, contact Laurie Laing of The U of M Alumni Association at (901) 678-2586... I am pleased to report that the first annual Engineering Alumni Reception was a resounding success, with approximately 75 guests in attendance. This free event was held November 19, 1998 in the VIP room at the Pyramid. The attendees were able to meet with other engineering alumni, faculty, and supporters of the College. The evening's highlight was Dean Warder's announcement of several Professorships that have been awarded to various faculty members, and recognition of their sponsors... The Board is busy planning the Engineering Awards Banquet, to be held on Thursday, March 11, 1999. The banquet will feature the Outstanding Engineering Alumni Award, presented to a U of M Engineering alumnus who has demonstrated outstanding achievement in personal and professional activities, academics, research activities, community involvement, or service to the University. The Board is currently accepting nominations for this award. Please contact the Alumni Association at (901) 678-2586 for a nomination form. We look forward to seeing you there!

Barbara Wilson

## Alumni News

We at the Herff College of Engineering are very proud of the accomplishments of our graduates. Please fill out the form on the back, and return it to the College. We and your classmates want to hear from you! We have received notice of the following information regarding our alumni.

### 1970's

**Robert E. Bailey** (BSCE, '72; MSCE, '80) is the Senior Vice-President, Civil Group, for Pickering Firm, Inc...

**Robert H. Dodds, Jr.** (BSCE, '73), of Mahomet, IL, has been named the first Newark Professor of Civil Engineering at the University of Illinois...

**James R. Liles** (BSEE, '71), President of Liles Engineering Design Consultants Inc., has been appointed to the Herff College of Engineering Advisory Council...

**Michael G. Spiotta** (BSET, '76) is Executive Officer/Owner of BBS Architectural Millwork, Inc. in Memphis...

### 1980's

**Donald O. Barber** (MSINSE, '83) has been promoted to Senior Vice President of Air Operations at FedEx...

**Michael R. Bilderbeck** (BSME, '80) is Chief Mechanical Engineer for Pickering Firm, Inc. He was recently licensed as a fire protection engineering and is currently involved in designing the addition to the Cook Convention Center...

**Mark Hodges** (BSET, '88) is Senior Business Applications Analyst for Federal Express Corporation. He is currently working on his MBA at CBU. Married Pamela Wilson on September 26, 1998...

**David M. Hurtado** (BSME, '85) is Director of Real Estate and Facilities Planning for ICG Communications, Inc. in Greenwood Village, Colorado...

**Gary A. Scruggs** (BSCE, '80; MSCE, '86) is Principal Chief Transportation Engineer for Pickering Firm, Inc. He recently designed the center runway (the "world" runway) at Memphis International Airport...

**Robert E. Wray III** (BSEE, '88) is an Assistant Professor in teaching/research at MTSU. He received his Ph.D. in Computer Science from the University of Michigan in July 1998...

### 1990's

**Michael E. Arnett** (BSET, '90) is Electronic Commerce Coordinator/Programmer at Ferry-Morse Seed Company. He resides in Troy, TN with his wife, Stacy...

**William M. Carter** (BSET, '94) is Executive Officer, Second in Command aboard the USS Firebolt for the U.S. Navy...

**Paul T. Gavin** (BSCE, '95) is Junior Civil Engineer for Reaves Sweeney Marcom, Inc. He recently designed the drainage plans for the Jack Nicklaus Spring Creek Ranch Golf Course...

**Pin Lu** (MS, '98) has accepted a position as a Computer Specialist at SHIPS Co. (Suburban Hospital Integrated Physician Services) in Bethesda, MD...

**Woodrow Martin** (BSME, '96) is a Mechanical Engineer for Pickering Firm, Inc...

**Timothy W. Mays** (BSCE, '96), a recent recipient of one of ten NSF doctoral research fellowships in civil engineering, is conducting his research on preventing structural damage during earthquakes at Virginia Tech...

**David Tian** (PhD, '93) is Branch Manager with J.B. Oxford and Co. in Beverly Hills, CA...

### College Administration

Dr. Richard Warder, Dean  
Dr. Charles Bray, Associate Dean  
Dr. Frank Claydon, Associate Dean  
Ms. Carol Ferguson, Academic Advisor  
Dr. Jerry Anderson, Director, Ground Water Institute

### Department Chairmen

Dr. Vincent Turitto, Biomedical Engineering  
Dr. Martin Lipinski, Civil Engineering  
Dr. Babajide Familoni, Electrical Engineering  
Mr. Ronald Day, Engineering Technology  
Dr. John Hochstein, Mechanical Engineering

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Herff College of Engineering  
The University of Memphis  
Memphis, TN 38152

Or send by FAX to (901) 678-4180.

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Newsletter Contributors: College Newsletter Committee, Department Chairs, faculty and staff

# Alumni Feedback

Mail to: Herff College of Engineering, The University of Memphis; Campus Box 526572; Memphis, TN 38152-6572

Name \_\_\_\_\_ Degree(s) \_\_\_\_\_ Year(s) Graduated \_\_\_\_\_

Address \_\_\_\_\_

City/State/Zip \_\_\_\_\_

Home Telephone \_\_\_\_\_ Work Telephone \_\_\_\_\_

Employer \_\_\_\_\_ Position \_\_\_\_\_

Position Responsibilities \_\_\_\_\_

Recent Accomplishments \_\_\_\_\_

What information would you like to see in Herff Highlights? \_\_\_\_\_

I would like information on the following:

- Establishing a named endowment in the Herff College of Engineering
- Donating equipment and other gifts-in-kind to the Herff College of Engineering
- 

Contributions to The University of Memphis may be designated to the Herff College of Engineering.

Enclosed is a check in the amount of \$ \_\_\_\_\_ to The University of Memphis Foundation, designated to the Herff

Please check one of the following:  Undergraduate Scholarships  Graduate Scholarships

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