The Department of Industrial and Engineering Technology

IET Informer

Morehead State University

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Special points of interest:

- MSU seeking applications for Assistant Professor of Industrial Technology. Application reviews begin in April, 2005.
- May & June 2005 Tech Prep Workshops at MSU.
- Graduation Reception, May 13, 2005
- STIEC '05 Conference May 18-20, 2005.
- NAIT 2005 Convention: November 16-19, 2005.

MSU President Visits IET

During his first weeks as MSU President, Dr. Wayne Andrews has made opportunities to visit the departments and offices of the University getting to know the people, the departments, and the culture. On March 4th, he spent close to two hours with the faculty and staff of the Department of Industrial and Engineering Technology.

President Andrews had three questions:

1. What are the Department's strength?

2. What barriers to the Departments's success exist over which the University may have some influence or control?

3. Are there immerging programs within the Department that would benefit the students and the University if additional resources were available?

In addition to discussing these issues, Dr. Andrews was interested in hearing comments of faculty and staff, frequently taking notes during the discussions. IET faculty requested suggestions and assistance in marketing IET programs and the types of high skilled, high paid career opportunities open to our graduates. Members of the IET Advisory Board have emphasized that the general public needs to regard MSU as an institution that offers degrees in highly skilled, advanced technology fields.

Dr. Andrews speaks with faculty.
(pictured from left: Dr. Grise', Dr. Morella & Dr. Andrews)

President Andrews stated that student success is the most important thing he can talk about when he is visiting with people from outside Morehead State University. The success of our graduates is the best recruiting tool available.

Welcome New IET Graduate Assistants

Keith Roe graduated from MSU in 1996 with a BS in Physics and was admitted to the MSIT program in spring 2005. He is father to four children and currently lives in Fleming County. His GA activities include assisting faculty in Construction Management Technology and pursuing research with faculty and other GA s in electronics and materials science.

Dalcus Sparks graduated from MSU in Dec. 2004 with a BS in Industrial Technology. He is a 39 year- old father of three children, spent three years in the Army, and has owned his own businesses. He moved to Kentucky in 1995 and currently lives in Menifee County. Among other things at IET, he is the liaison between the Department & Boneal, Inc. on Rapid Prototyping projects.

As state dollars for post-secondary education decrease, monies brought to the University through grants is increasingly important as we try to meet our goal to provide quality education with state-of-the-art lab equipment and modern multimedia classrooms.

IET Faculty Collaborate on NSF Materials Science Grant—$200,000 Requested

Four IET faculty and an IET Graduate Assistant recently submitted the largest curriculum enhancement grant of its kind in the history of Morehead State University. The grant, submitted to the National Science Foundation (NSF), requests nearly $125,000 with matching MSU funds of nearly $75,000 for new equipment to enhance student learning in materials science at MSU. Entitled "**Enhancing Undergraduate Education in Materials Science**," the grant was collaboratively developed by IET faculty Dr. Charles Patrick, Dr. Bill Grisé, Dr. Farouq Al-Hourani, Dr. Myoungsu Sin and IET GA Joe Barker. The problem addressed by the grant is the lack of in-depth materials science curriculum resulting from inadequate testing facilities within the College of Science and Technology at MSU and specifically within the IET department.

If funded by the NSF, the project outcome, by adding modern equipment to the department's existing testing facilities, will link theories and concepts learned by students in a variety of undergraduate courses to hands-on experiences in materials science. These experiences will serve to reinforce theoretical concepts and to physically demonstrate the contingent nature of the experimental data supporting these concepts. The IET department should learn in mid-2005 the outcome of the grant proposal. Questions relating to this grant should be directed to the grant's Principal Investigator Dr. Charles Patrick.

University Internal Grant Awarded

Dr. Myoungsu Sin, Assistant Professor, and Mrs. Sharon Austin, Adjunct Faculty, have received a University-funded research grant ($ 4,975) for the proposal submitted to the Research and Creative Productions Committee in spring 2005: "Investigation of electro-mechanical behavior of nickel-coated carbon fibers for use in structural health monitoring." The main objective of this research is to investigate the electro-mechanical behavior (correlation between stress-strain behavior and electrical conductivity) of nickel-coated carbon fibers, as a potentially improved material over plain (uncoated) carbon fibers for use in structural health monitoring. Much research is underway in many countries on the feasibility of using plain carbon fibers as lightweight, heat-tolerant, and electrically conductive sensors to monitor structural integrity in large structures. A fundamental weakness of using plain carbon fibers in developing smart composite materials exists in their poor interfacial bonding with a matrix; that is, they do not adhere well to the material in which they are embedded. Strong adhesion is desirable in order to reduce the susceptibility of a composite material to micro-structural disintegration, so as to ensure effective electrical conduction and load transmission between the fiber and the matrix. One possible way to improve the bond between the carbon fiber and a certain matrix is to coat carbon fibers with an appropriate material. Nickel-coated carbon fibers are more electrically conductive and have the significant advantage of being more resistant to impact. Consequently, nickel-coated carbon fibers are expected to provide better performance than plain ones in the development of smart composite materials. Three groups of 1/5-scale reinforced concrete (R/C) beams will be tested under four-point bending in this research: the first with no fibers, the second with plain carbon fibers, and the third with nickel-coated carbon fibers. As the R/C beam is subjected to gradually increasing loads, mechanical (axial stress and strain) and electrical (conductivity) data are continuously measured and analyzed through a computer-based data acquisition system. The test facility granted will also enhance undergraduate and graduate educational opportunities to develop hands-on skills for in-field structural assessments and to design their own experimental projects.

Updating Electronics & Telecommunications Lab through Grants

Recently the Electronic and Telecommunication Laboratories acquired new equipment through Title 1C Funding and the Internal Grant of Dr. Yudi Gondokaryono. We also acquired software and equipment through donation by ALTERA Corp.

The electronics lab will benefit by the addition of five new color oscilloscopes and four arbitrary signal generators. The electronics lab also received eight B²SPICE, which is both an analog and digital circuit simulator. ALTERA donated one ALTERA FPGA Laboratory kit and 10 sets of QUARTUSII 4.2 Logic Design Development software. The QUARTUSII is a widely used FPGA development software. This equipment will benefit many of the ITEC classes such as ITEC 141, ITEC 241, ITEC 245, ITEC 355, and ITEC 445.

The telecommunication and computer lab acquired a Spectrum Analyzer and eight sets of DSP56302 Evaluation boards. The spectrum analyzer is a great tool for signal analysis. Many of the telecommunication and electronic classes will benefit from using this tool. The DSP evaluation board will be used for our digital signal processing classes (ITEC 500 and ITEC 550). DSP56302 uses the Motorola DSP processor which is widely used in the telecommunication and electronic industry.

Two XEON class servers were also acquired to support our networking classes. These servers will be used such that the students can learn how to install, configure, and maintain network services (e.g. Web, Mail, DNS, FTP, DHCP, SAMBA, and many other). These servers can also support the current project of developing an on-line MSIT program. In the future, these servers can be used to support other academic function in the IET department.


DR. YUDI GONDOKARYONO

We appreciate the University administration's support of the high-technology needs of the Department of Industrial and Engineering Technology. State-of-the-art equipment will supply our students with the opportunity to develop the advanced technological skills needed for employment in contemporary organizations.

Re-cycling Computers for Learning

When many of the "old" faculty computers are being replaced, Dr. Gondokaryono saw an opportunity for students in the telecommunication lab to build a Beowulf Cluster to expand student interest in the area of high performance computer and networking. They collected eight "old" computers where each one is a PIII 450 MHz with 128MB DRAM, 12GB storage, and 100Mbps Ethernet. Even though these machines are considered out-of-date, they still have enough computing power and lifetime to serve this purpose. A LINUX Fedora 3 operating system was installed on each node because many of the Beowulf cluster tools are available under LINUX. Both PVM (Parallel Virtual Machine) and MPI (Message Passing Interface) will be installed as the tool to build parallel programs, and some graphical tools for monitoring performance such as XPVM and ParaDyn will be added. So far, a few test programs have been successfully run and Dr Gondokaryono will be guiding his students in the creation of parallel programs using C/C++ for speeding up the Artificial Neural Network learning process for a large number of patterns.

In October of 1997, the Department of Industrial and Engineering Technology established an Advisory Board of leading professionals who are actively involved in the management of educational, business, and industrial organizations. The primary purpose of this Board is to provide expert suggestions and feedback relative to IET programs and their potential impact on the economic development of MSU's service region.

Advisory Board Highlights

Christie Smallwood, Summit Polymer

Christie Smallwood is the Human Resource Manager for Summit Polymers, Inc. in Mt. Sterling. Summit Polymers is an automotive supplier of injection molded interior parts. Christie's career path did not start out in the automotive field, let alone in industry. Although her father worked in industry for 24 years, most of her families' career's were in the Medical field, so she felt it only natural to pursue a career in health. Her interest was in business, ao she decided to attend Morehead State University and major in Business Administration with the hopes of being a Hospital Office Manager upon graduation. She received a Bachelor's of Business Administration Degree in 1994 and obtained a part time job in a hospital. She applied for an HR Coordinator position at Summit Polymer to gain full time employment just until she could find something in a hospital. That was almost 9 years ago.

Christie realized that her true passion was in manufacturing and human resources. She quickly adapted to working in a lean manufacturing environment and after 5 years was promoted to Human Resource Manager. She is not only responsible for the daily Human Resource functions but is in charge of the plant's Environmental System and ISO14001 (Environmental) registration. She is also an internal auditor for TS16949 (Quality Certification). Christie maintains employee involvement through the many programs that Summit has to offer such as continuous improvement activities. She also has a close interface with the role of the General Manager in the daily operations of the plant. In addition to plant functions, Christie plays an active role in the industrial community, serving as the President of the Training Consortium and Vice President of the Local Emergency Planning Committee.

As a member of the Department of the Industrial and Engineering Technology (IET) Advisory Board, Christie feels that membership in this collaborative group is as important to industry as it is to IET. It gives business and industry a chance to coordinate their needs with the Department to develop the appropriate curriculum. It is always a challenge to fill an engineering position when one comes open. Being able to voice opinions on changes to engineering curriculum within a university gives the opportunity to have available talent ready to hire directly from local universities whether it be in a permanent position or in a co-op experience. One issue that Christie notices when hiring engineering staff is that there are not as many females applicants as there are males. However, the engineering field has evolved over the past years with numerous automotive companies locating in the United States and several females have become very successful within the Summit Polymers Corporation Engineering Departments. Christie hopes the current trend of females beginning to look at industry as a career option continues.

Automotive is a fast paced career choice and whether you are male or female, you never know what is going to come your way next. Christie feels this is the reason why she has chosen to stay in industry. Juggling her busy profession with a family isn't always easy but she is glad she made this career choice.

Why I Chose A Career in Industrial Technology

I have many reasons behind my choice of attending IET at Morehead State University. I had already graduated from the KCTCS system (Ashland Technical College) and wanted to go further. Having four brothers really influenced my career decision. Growing up, it was much more exciting to play with my brothers and GI- Joe than play alone with my dolls. In high school I wanted to take auto mechanics while my parents wanted me to take secretarial courses. I have just always found mechanical, electrical, technical things more interesting and exciting.

(Nancy Artrip is a senior in the graphic communications program option)

A Career in Industrial Technology -- continued

As a student of the Industrial Computer Aided Design option, I feel that I have chosen a career that is very competitive and on going. It is a career that supplies you with new knowledge everyday and though the years. The reasons I have chosen this field is because of my love of drawing and construction. It's not just a man's job anymore. More and more women are getting into the many different fields of Industrial Technology and I am proud to say I am one of those women. The job I wish to have once I graduate would be with Toyota in Georgetown KY. With my ability to design parts and etc. using Autodesk Inventor Professional 9 and AutoCAD 2004/ 2005, the thought of being able to design Toyota's parts and design their cars would be a dream job for me. I love these cars, not only because I own one but because I would like to understand the quality and help design quality parts that goes underneath the hood.

(Cassie Price is a senior in the graphic communications program option)

I was influenced to major in IET after taking a class in the department. I found the subject matter very fascinating, and after talking with a faculty member about the department and the classes, I decided to major in it. I would be pleased to be working in the design field, preferably in a manufacturing environment.

(Jamie Campbell if a senior in graphic communications program option)

Thirty-five female students are currently enrolled in IET programs: 8 in the Master's program, 13 in Graphic Communications, 6 in Manufacturing and Robotics, 6 in Career and Technology Education, 1 in Construction Management, and 1 in Telecommunication and Computers.

IET Manufacturing Updated with Grant Monies

The IET Manufacturing and Robotics Laboratory received several National Instruments (NI) items: NI LabView 7.1 software, NI Vision system and NI Motion system, purchased with grant monies. The NI LabView 7.1 software (installed in LC 301 and RH 100) is a graphical development environment for creating flexible and scalable test, measurement, and control applications. Students will be able to interface with real-world signals, analyze data, and control the system. This software will be used for several classes at Dept. of IET: ITMT 370 Robotics Interfacing, ITMT 488 and IET 688.

The NI motion system consists of NI PCI-7344 4-axis Servo/Step Motion Controller and Motion Assistant SW for Motion Control Programming. This motion system will be used for developing various applications in motion system. Roy L. Gentry and Tapani Kilpelainen, IET graduate students, are currently working with the motion system for their project in IET 688 Computer Integrated Manufacturing class. In their project, titled "Development of 4-axis camera positioning using Motion Control NI-7344 applied in Automatic Inspection Process", they try to develop a motion system whereby a camera can be positioned at several points in a spherical workspace in order to take images of an object being inspected. This project has also been submitted for consideration as a presentation for the 2005 NAIT convention that will be held at St. Louis in November.

The NI Vision System consists of IMAQ PCI-1411 and IMAQ PCI-1424, IMAQ software. With this vision system, students can develop an automatic inspection system. Yogesh D. Patil and Terry D. Fraley, MSIT graduate students are currently working with this system for their project in IET 688. Their project has also been submitted for the 2005 NAIT convention. For the first phase, students will use this equipment for developing an inspection system applied to counting numbers of teeth in gear inspections. Both projects are supervised by Dr. Rachmawati Wangsaputra

Dr. Rachma Wangsaputra

Outstanding Senior Project, Fall 2004

Mr. Dalcus Sparks, an IET graduate (Manufacturing option) and current IET Graduate Assistant, was presented the Outstanding Undergraduate Research Awarded for best overall project in the IET 499C Senior Project class at the departmental graduate reception on Friday, December 17, 2004. Mr. Sparks' project was entitled "Design and Installation of a Photovoltaic Panel." During the Fall 2004 semester, Mr. Sparks designed and built all the components necessary to complete the installation of a solar panel system on top of the Lloyd Cassity Building on the MSU campus. As part of his project, Mr. Sparks also developed two laboratory activities to be utilized by undergraduate students in electronics classes. Mr. Sparks received a $100 cash award in addition to being honored in front of IET faculty and fellow graduates at the departmental reception. Mr. Sparks is continuing his education at MSU in the MSIT program in IET. He is a departmental GA and is assisting Dr. Rachma Wangsaputra in the ITMT 286 and 488 laboratories.

The Department of Industrial and Engineering Technology had 30 undergraduates and 15 graduate students in December 2004. A reception was held for the graduates and their families in the Commonwealth Room, ADUC on December 17th. IET has 35 prospective graduates for spring commencement.

IET 499C Project Titles - Spring 2005

IET 499C, Senior Project, is an applied research course required for all current graduating seniors.

1. Matt Anderson - Industrial Electrical Plan
2. Nicholas Arnett - Optical Mail Detection
3. Nancy Artrip-Didi - Renovation of an "Old Kentucky Home"
4. Jonathan Baldwin - Easy Stretcher
5. John Ballard - Portable Safety Ramps
6. Kris Bushelman - Three Finger Mechanical Gripper for the Motoman Robot
7. Jesse Carper - Design and Manufacture of Handgun Slide Assist
8. Caleb Chandler - Installation-free shift light
9. Ryan Clem - Implementing a Conveyor Process
10. Cindy Craft - Experience versus Inexperience in Estimating
11. Alex Cunningham - Zero Impact Development Design
12. Drew Driskell - Comparison of Traditional and Log Home Building Techniques
13. Adam Dyer - Sun Searcher
14. Colin Faulkner - Renovations at Pomp Asphalt Plant at West Liberty, KY
15. Rachel Frayne - Perfect Fit Car Seat
16. Justin Lane - Comparison of Water-Immersed and Air-Dried Concrete Cylinders
17. Michael Little - Small Airport Design
18. Chris Litton - Sustainability
19. Derrick Logan - Asphalt Batch Plant Alarm/Bypass System
20. John McNeel - Suicide Safeties: Safety Latches for Sui cide Doors
21. Justin Meade - Remote Internet Switch
22. Travis Montgomery - Load Hopper De sign/Development
23. James Morgan - Inefficiency and Heal Loss in Tradi tional Block Structures
24. Phillip Murray - Industrial Fan Installation
25. Nick Pecco - Trailer Light Monitor
26. Adam Prater - Impact Wrench Adapter
27. Alonzo Prater - Design and Process Plan for the Uni versal Monopod
28. James Rhodes - Analysis and Redesign for an Eastern Kentucky Rental Development
29. Kevin Sims - Design of a Wind Powered System
30. Louis Tobbe - Dual Hunt Stand
31. David Thomas - Solar Panel Tracking System
32. Zach Thompson - Ergonomic Hammer

IET Graduate Highlight

Mr. Willie Boggs
OSRAM Sylvania Inc.

Mr. Boggs graduated from MSU in May of 1999 and immediately went to work for OSRAM Sylvania Inc., in Winchester Kentucky where he was employed for 4 years designing automated control systems for state-of-the-art lamp manufacturing. He was responsible for capital projects valued for more than $500K each. He had many successful projects during his time at Winchester and was promoted to Sr. Design Engineer in spring of 2002. He also was the recipient of several OSI "Trade Secret" awards (patents) for software development in machine controls.

In April of 2003 Siemens VDO Automotive in Blythewood South Carolina approached Willie for a Controls Engineering position. So in May of 2003 he left OSRAM and went to work for Siemens VDO. This Siemens facility was a joint venture between International and Siemens. The plant manufactured diesel fuel injectors for International, who in turn sold there engines to Ford, which used the product in heavy duty trucks, buses, and utility vehicles. There, he spent most of my time upgrading transfers with Adept robots and integrating high precision gauging equipment. While at Siemens Mr. Boggs was presented with the "Manager's Award" for his expertise rendered during the legal arbitrations between Siemens and subcontractor.

Personal circumstances required that Willie move back to Kentucky, so in October of 2004, he accepted the position of Principle Electrical Design Engineer with OSRAM Sylvania Inc. Working out of his office at the Versailles lamp facility, he reports directly to OSI equipment development central in Manchester New Hampshire. He is responsible for multiple electrical capital equipment projects across several manufacturing facilities throughout the US.

Mr. Boggs is just one example of the highly skilled graduates of IET who can enter the workforce immediately upon graduation to provide quality service to employers.

Student Organizations

by Tom Pickerill

Last fall the student chapter of the Society of Manufacturing Engineers (SME) and the student chapter of The National Association of Industrial Technology (NAIT) were at a low point in membership. While a core of interested members remained the numbers had dwindled to disappointing levels. Since many of the students held membership in both organizations, they decided to develop a closer symbiotic relationships. Both organizations are devoted to helping educate members as to employment and learning opportunities. Add to that a mix of social interaction and the chance to meet actual employers who explain what they are looking for in their new hires and you get a leg up on the competition in finding the job you really want after graduation instead of just a job to pay the bills.

Since that time, and with the renewed energy of a larger membership roll, the chapters have begun a revitalization of both sprit and membership. Meetings are currently being held in the robotic team room on the first floor of Reed Hall.

The groups are currently working with the IET-476 Special Projects class to develop a robot for competition at the NAIT Convention in St. Louis next November. This is a national competition and it is an honor to attend let alone compete. Morehead has won third place nationally for the last two years. Rumor has it that the team is making plans to win the first place trophy this year. The organizations are looking for volunteers to help design and manufacture a presentation board for display and scoring at this competition. Inquiries can be directed to Joe Mackey at joealan@mac.com.

Tom Pickerill,
SME President

Invitations have been sent to business leaders to come and make presentations and answer questions of members. All students are invited to these presentations even if you are not a NAIT or SME student member. This is an effort on the part of the student chapters to help every student find that job they want. Plant tours at some area manufacturing facilities are also being planned.

SME and NAIT student chapters invite you to come on down to one of the meetings. Free pizza and soft drinks are provided.

Internships at AK Steel

Melanie Edwards and Amanda Collinsworth have the same desire to succeed in what most would call a "man's world." Both ladies received their Bachelor of Science degree in Industrial and Engineering Technology at MSU in December 2004 and have enrolled as graduate students of the MSIT program. The knowledge that they have obtained as undergraduates and what is yet to come as graduate students, will surely prepare them for the industrial atmosphere.

Due to the collaboration with MSU and AK Steel in Ashland, Kentucky, Melanie and Amanda have recently received internships as Quality Coordinators. As Quality Coordinators, they maintain control of documentation that is relative to their departments, such as job procedures, JSHA's Control Plans, Manufacturing and Environmental Layouts. Each intern participates greatly in the internal and external audits that are conducted throughout the year at AK Steel at the Ashland, Kentucky plant.

Although greatly appreciative of their titles, Amanda and Melanie are grateful to the IET department for what they have been taught and the experience that has been gained thus far. All in all, these two ladies won't let a "man's world" stand between them and their careers.

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