

## Advanced coatings research to extend service life of military vehicles/equipment

Eastern Michigan University's (EMU) Coatings Research Institute (CRI) will receive \$2.1 million from the Department of Defense (DOD) for an innovative research program to extend the service life of military vehicles and equipment by developing corrosion control technology and coatings resistant to chemical and biochemical agents.

This program embodies development of corrosion resistant materials and coatings; development of techniques for detecting and measuring corrosion for use as screening tools and assessment of long term performance; and evaluation of the capability of new materials and novel coatings technology to protect metal substrates against corrosion.

In addition, anti-microbial coatings will be developed that are safe, environmentally benign and will enhance the sustainability of field systems. These coatings will contain safe anti-microbial agents that can effectively break down and kill microorganisms that come in contact with the vehicle/equipment surface

during battlefield engagement.

An Army Materiel Command corrosion prevention and control program documented that corrosion costs amounted to \$10 to \$20 billion per year for the DOD.



Provder

As the age of field systems increase, the impact of corrosion will increase exponentially.

In the longer term, Army vehicles/equipment may be expected to last up to 50 years, with an average service life of 22 years. Therefore, it is imperative that new materials and novel coatings be developed to protect metal surfaces against corrosion and significantly extend the service life of Army vehicles/equipment as well as improve readiness rates.

The goal of DOD is to provide a \$4 return on each dollar invested in corrosion control by reducing maintenance costs and extending service life. This research program



**RESEARCH CENTER:** Eastern Michigan University's Coatings Research Institute is currently working on a project with the Department of Defense (DOD) to extend the service life of military vehicles and equipment by developing corrosion control technology and coatings resistant to biological and chemical agents.

will help DOD meet its investment goal.

This research program is an interactive partnership of CRI with the U.S. Army Tank-Automotive & Armaments Command in the U.S. Army Tank Command (TACOM) in Warren, Mich., and with the U.S. Army Research Laboratory, Weapons and Materials Directorate, Coatings Technology Team at the Aberdeen Proving Ground, Md.

CRI faculty and students

will work side by side with Army scientists on campus and in Army labs. Graduate and undergraduate students will obtain a sense of fulfillment from seeing their research efforts applied to national defense needs.

Theodore Provder, Ph.D.  
Director

Coatings Research Institute

## New center focuses on manufacturing, innovation



*"The Center for Product Research and Development helps inventors and companies bring their ideas to market, as opposed to finding a market for our own ideas. Priority is placed on projects that are compatible with the center's capabilities and contribute to the stability and growth of the small business sector of Michigan's economy."*

**Dan Fields**  
Director  
Center for Product Research and Development



**STUDENT CONTRIBUTIONS:** Project team members, like Rashesh Joshi (left), a graduate assistant and engineering management master's degree candidate, help to create new products at the Center for Product Research and Development. Parts produced on the computer-controlled turning center are inspected by Brandi Signorelli, an EMU freshman majoring in mechanical engineering technology.

The Center for Product Research and Development (CPRD) is Eastern Michigan University's newest center. The Center serves a role much different than

traditional university technology transfer centers in that it is dedicated to helping manufacturing and construction businesses grow. The traditional role of most

technology centers is focused on intellectual property management, with em-

# Aviation flight technology program hits the runway

The Department of Interdisciplinary Technology has initiated a new program this semester that provides for a bachelor of science degree in aviation flight technology.

Students earn Federal Aviation Administration (FAA) pilot certificates, which include the commercial, multi-engine and instructor ratings. The Aviation Flight Technology program consists of 49-55 credit hours of basic studies and 70 credit hours of an intensive flight major. Graduates will be qualified for entry positions as professional pilots into the aviation industry.

The program incorporates an industry partnership with Eagle Flight Center, located at Willow Run Airport. Such a model provides a means for the program to provide flight training activities without the University's need to purchase aircraft or support equipment.

The program's design is based upon a model used by Arizona State University and other collegiate flight education programs that utilize



**FLYING HIGH:** Eastern Michigan University's Department of Interdisciplinary Technology recently partnered with Eagle Flight Center at Willow Run Airport (above) to offer an Aviation Flight Technology Program. The University will provide 49-55 hours of basic studies needed to obtain the degree while Eagle Flight Center will provide the 70 hours of intensive flight training. Graduates will be qualified for entry positions as professional pilots in the aviation industry.

partnerships with flight training centers.

Faculty and administration from interdisciplinary technology visited Arizona State University a year ago to review their partnership model and to build a starting point from which to develop the program at Eastern Michigan.

Additionally, program faculty received a great deal of information and advice from a number of other University

Aviation Association (UAA) member collegiate programs.

Perhaps the most important piece of information received from the UAA is the future role of collegiate aviation. Today, the aviation workplace is experiencing a dwindling pilot pool and, according to airline representatives to the UAA, the industry is now looking to collegiate aviation to meet its needs.

Today's employers, how-

ever, are looking for more than piloting skills. Employers are also seeking individuals with a solid educational foundation that builds integrity, and EMU's program has been designed to meet these industry demands.

An open house was held at Eagle Flight Center for the media and other aviation enthusiasts was scheduled Oct. 10, 2002. A number of newspaper articles were published

and several TV spots were produced announcing the new program. These efforts resulted in numerous telephone calls from student prospects.

Additionally, Eagle Flight Center's parent company, Michigan Institute of Aeronautics (MIOA), sponsors a number of high school programs designed to recruit high school graduates into aviation. MIOA provides aviation maintenance training and graduates earn their FAA Airframe and Powerplant ratings. We are now using the MIOA high school recruitment programs to recruit future students for the Aviation Flight Technology program.

The program also serves the University of Michigan Naval ROTC unit. Naval ROTC Mid-Shipmen that have earned a Naval scholarship and who have selected an aviation flight career path are sent to EMU to complete the Aviation Flight Technology program to prepare them for Naval flight training.

Presently, the program has 15 majors, with enrollment for Fall 2003 expected to be at least twice that number.

## Engineering technology education offers many options

Eastern Michigan University will offer four Engineering Technology programs in Fall 2003: Mechanical ET, Electronic ET, Computer ET, and Manufacturing ET. All four programs are four-year, bachelor of science disciplines designed to be fully accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology (TAC/ABET).

High school students with math sub scores of 21+ on the ACT, who enjoy working in teams to solve problems, and applying science to "specific situations" would be suited to these majors.

Engineering Technology is that part of the technological field that requires the application of scientific and engineering knowledge and methods, combined with technical skills in support of engineering activities. The baccalaureate program prepares the graduate to make independent judgments, understand systems components and operate systems to achieve conceptual goals.

Because of the applied nature of engineering technology, laboratory experience plays a major role in the educational process. Laboratory

courses are an integral part of theory courses in many of the major field areas. A valuable adjunct to an engineering technology program is a cooperative education program in which the student is offered an opportunity to learn first-hand about the world of work and provide experience that will be valuable in placement after graduation. And they offer a means of financial support.

Career opportunities for engineering technologists lie in designing and developing hardware from proven concepts; analyzing and developing products; managing the construction and operation of production processes; servicing machines and systems; and providing sales support for technical products and systems. In some technical operations, engineering technologists and engineering graduates may perform the same function.

Eastern Michigan University's Engineering Technology program provides an exciting entrance to a technical path that offers challenges, on-the-job advancement opportunities and personal satisfaction. Many thousands of recent engineering technology graduates are making significant contributions to our society.

### ENGINEERING OPPORTUNITIES

**MECHANICAL ENGINEERING TECHNOLOGY** develops the practical skills for applying fundamental engineering principles that relate to the mechanical and structural design of devices, products and processes. Graduates may find employment as a machine designer, product engineer, design engineer, manufacturing engineer, process engineer, tool designer, production designer and many other professional positions.

**ELECTRONIC ENGINEERING TECHNOLOGY** develops an understanding of electronic circuitry in the building, testing and application for product design, automation and instrumentation. Employment for graduates includes: electronic designer, control or instrumentation technologist, applications engineer, technical writing, sales engineer, quality control and similar support activities.

**COMPUTER ENGINEERING TECHNOLOGY** develops the application of scientific, computer and engineering knowledge and methods, combined with technical skills in support of computerized activities. Graduates may find employment in consumer products or medical devices, control systems for automobiles, aircraft and trains, and applications in telecommunications, financial transactions and information systems.

**MANUFACTURING ENGINEERING TECHNOLOGY** develops the design, analysis, planning, supervision and construction of methods and equipment for the production of industrial and consumer goods. Graduates may secure employment as a manufacturing engineer, process engineer, production engineer, tool engineer, quality engineer, sales engineer, application engineer or industrial engineer.

## Ph.D. in technology planned for fall 2004

Approximately 15 applicants will comprise the student cohort annually for the first three years that the Ph.D. in Technology is in operation. This journey towards an advanced degree will test students intellectually and personally, and require their best efforts.

It is expected that faculty and student scholarship will coalesce around three major themes:

- interactions among science, humanities and technology, and their relationship to society and culture
- management and policy issues associated with deployment and assessment of technologies within organizations and among employees
- chemical and physical problems facing expansion of the knowledge base in coatings technology.

The Fall 2004 launch date for the Ph.D. in Technology at Eastern Michigan University awaits action by EMU Provost and Vice President for Academic Affairs Paul Schollaert. Schollaert appointed a six-person panel of representatives from the Colleges of Technology and the College of Arts and Sciences to

advise him on any remaining needed revisions in goals, curriculum and administrative processes, such as admissions and communications. The panel is chaired by Associate Vice President for Graduate Studies and Research Robert Holkeboer and assisted by Director of Course and Program Development William Miller.

The Michigan Council of Vice Presidents of Academic Affairs, the EMU Board of Regents, and the Higher Learning Commission of the North Central Association of Colleges and Schools have approved the program. The courses have been reviewed and approved by four of EMU's five colleges. The six-person panel is addressing any valid issues prior to implementation.

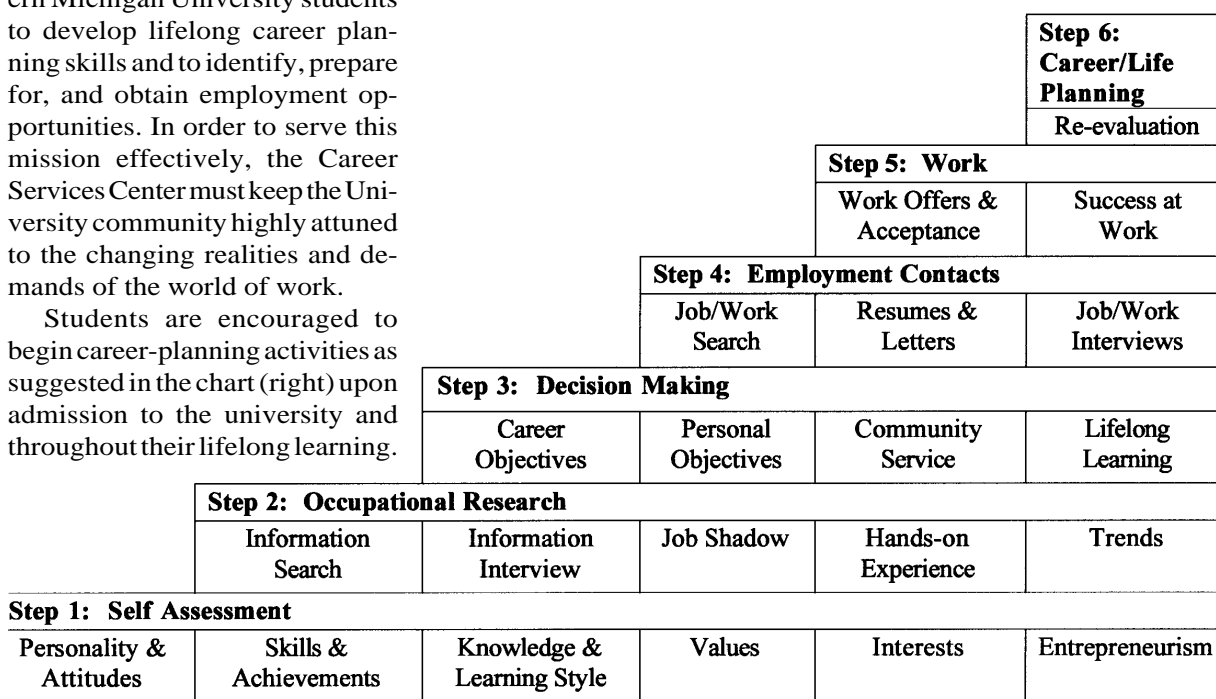
Candidates for the Ph.D. in Technology director position have been identified and will be visiting campus in the coming weeks for interviews.

## Career Services Center aids students in career planning, job opportunities

The mission of the Career Services Center is to empower Eastern Michigan University students to develop lifelong career planning skills and to identify, prepare for, and obtain employment opportunities. In order to serve this mission effectively, the Career Services Center must keep the University community highly attuned to the changing realities and demands of the world of work.

Students are encouraged to begin career-planning activities as suggested in the chart (right) upon admission to the university and throughout their lifelong learning.

### Steps to Navigate Your Future Career/Life Planning Success



Professional staff is available to assist current students and alumni during this process with relevant programs, services and resources offered from this department.

The College of Technology Satellite Office for Career Services is located at 109D Sill Hall or call (734) 487-9789.

Since its inception in fall 1998, this office has supported the mission of the Career Services Center at large as well as college specific goals. Although the targeted audience are students currently attending EMU as declared majors within the COT, many additional constituents are assisted through various services and program offerings.

The cooperative education program continues as the highest in demand from constituents of this office. Therefore, priority lies in pursuit of the resources necessary to provide constituents with the tools that will support their participation and positive outcome within this experiential program.

Students who have met the minimum requirements (a 2.5 or higher GPA and junior class level standing) can apply by obtaining the Application for Co-op, available at each of the Career Services Center campus locations. The application packet shares program guidelines, frequently asked questions and submission procedures.

To register and upload their resumes, all EMU students are encouraged to visit <http://ecampusrecruiter.com/emich>. E-Campus Recruiter is the on-line software utilized by the Career Services Center for managing its On-Campus Recruitment program and Event Calendar.

Students are welcome to schedule individual advising appointments or attend workshops offered each semester. Resume writing, job search processes and interviewing skills discussed. For more information, go to: Career Services Center, 311 King Hall; call (734) 487-0400; or go to <http://career.emich.edu>.

## Master's program prepares students for training careers

Career, Technical and Workforce Education (CT&WE) has continually evolved and expanded since the 1917 Hughes Act, which established agriculture, trade and home economics as vocational education programs.

The current broad discipline of CT&WE includes education and training at secondary and postsecondary levels. Its mission is to educate and train America's workforce.

The purpose of this master's degree is to help teachers and workforce trainers acquire specific knowledge about the applications and consequences of technology in education and training. Graduates of this program will provide a wide range of education and training services to participants in career, technical and workforce education and training programs. These include knowledge development, skill development, accountability, contributions to economic success, and research-based data driven practices.

The future rests on the ability of educators and trainers to help people of all ages use, manage and understand technology for purposes of systems analysis, needs assessment, performance improvement, course and curriculum development, evaluation and problem solving. This master's program emphasizes the leadership skills and theories pertinent to specialists in business, marketing, technology, vocational and workforce education, and the meaning and purpose of technological literacy in schools, career centers and the workplace.

Successful participants in this program will:

- apply curriculum and program development principles in school and/or workplace programs;
- understand the effects of technology on careers and work;
- acquire knowledge of current theory and research relevant to career, technical, and workforce education; and
- demonstrate basic competence of applied research.

Admission requirements for the master's of science degree are:

- a bachelor's degree from an accredited institution with a minimum grade point average of 2.75. Applicants not meeting the minimum GPA may be admitted conditionally, based on the strength of letters of support and scores on the Graduate Record Examinations.

- GRE scores no more than five years old.
- an undergraduate major or minor in business, marketing, technology or vocational education; a valid teaching certificate in any of those fields; or have work experience in a workforce development position. Applicants without certification may be admitted where the content of this program is appropriate for their professional development.

International students must meet the above requirements and the Graduate School requirements on the TOEFL. Admission may occur in any semester. Program requirements include: core courses (11 credits); specialization courses (9 credits); research application courses (5 credits); and a thesis or applied action research project (5 credits).

# COT, Continuing Ed align to expand off-campus courses

The strategic planning process identified a need for streamlining policies and procedures within Academic Affairs to support the growth of flexible and innovative off-campus programming.

In response to this need, Continuing Education created program director positions to foster collaborative successes with the academic colleges. The key element of the program director position is the development and implementation of new programs.

Additionally, the position will strengthen relationships between Continuing Education and the academic departments, develop relationships with outside agencies, and participate in the assessment and evaluation of programs.

Continuing Education's strategic emphasis is on offering programs versus classes. As a result, Continuing Education has experienced a period of unprecedented growth, in which the College of Technology has played a significant role.

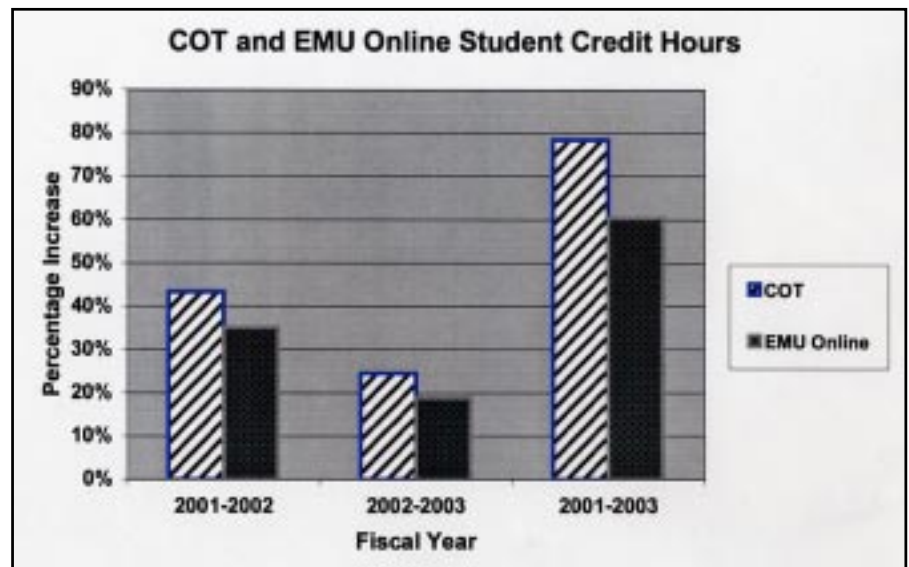
With offerings through Weekend University, EMU Online, and Continuing Education's six regional centers, the COT stands as a strong contributor to the strategic direc-

tions of the University. Currently, the COT offers seven programs through these venues, and is the third largest producer of student credit hours through Continuing Education.

The College of Technology's off-campus program offerings reflect the strength and diversity of the college. Currently, graduate programs and certificates include Construction Management, Engineering Management, Information Security, Legal Administration, Liberal Studies, and Quality. Engineering Management became a totally on-line program in fall 2002. The growth from 27 majors in fall 2001 to 62 in winter 2003 is more than a 22 percent jump in less than two years.

Bachelor completion programs include Applied Technology and Construction Management. The Technology Management program will enter its first year full rollout during fall 2003.

The innovation and excellence of the COT makes the pairing with Continuing Education a natural fit. Their shared focus on student needs, market demands and quality programming will ensure that the relationship between the two units continues to be successful and rewarding.



**NUMBERS STORY:** The graph (above) indicates the percentage increases of student credit hours in the College of Technology and EMU on-line courses, beginning with fiscal year (FY) 2001. The table (below) shows the data and growth for all undergraduate and graduate College of Technology and EMU on-line courses.

	Fiscal Year				
	2001	2002	% Change	2003	% Change
COT SCHrs**	1382	1980	43.3%	2464	24.4%
EMU Online SCHrs	6735	9098	35.1%	10796	18.7%
COT % of EMU Online SCHrs	20.5%	21.8%		22.8%	

\* FY 2003 includes only Summer 2002, Fall 2002, & Winter 2003  
 \*\* SCHrs - Student Credit Hours  
 All data courtesy of Continuing Education

## CPRD, from page 1

phasis on the identification of marketable products, particularly those developed by the university's researchers.

EMU's Center is focused on fulfilling the University's role in economic development and community outreach.

"The CPRD helps inventors and companies bring their ideas to market, as opposed to finding a market for our own ideas," said Daniel Fields, director of the CPRD. "Priority is placed on projects that are compatible to the Center's capabilities and contribute to the stability and growth of the small business sector of Michigan's economy."

The College of Technology, which houses the Center, has the right blend of faculty expertise and equipment to facilitate the product research and development process. The faculty has a wonderful combination of engineering and hands-on experience cultivated through years of industrial work. They carry theory into practice. The labs are equipped with industrial-

## SERVICES RENDERED

The Center for Product Research and Development (CPRD) is capable of working with metals, plastics, wood and most construction materials from concept to finished product. Capabilities include:

- Computer-Aided Design (CAD) Lab/24 stations
- Computer-Aided Manufacturing (CAM) Lab
- Plastics Lab with injection and blow molding (5 layer) and testing equipment
- Foundry, metal forming and metalography
- Machine and pattern shop
- Welding equipment to include: arc, gas, MIG, spot, TIG and ultrasonic
- Metrology with hardness, compression, fatigue, tensile and torsion test equipment
- Construction Computer Lab with 18 work stations.

grade computers, software, and machines that are capable of product design and prototype development.

The concept for the new center emerged in summer 2002. Fields realized that the COT had all of the resources — in terms of facilities, specialized manufacturing equipment and faculty — to assist inventors and innovative manufacturers in developing product prototypes and solve product development problems. Fields developed a pro-

posal for the Center, which was approved.

The mission of the CPRD is to provide a vital link between University resources and the manufacturing and construction industries through applied research and education. The goals are to:

- Create new processes;
- Develop new businesses through product design, prototypes and testing;
- Expand sponsored-research programs;
- Integrate technological

innovations into economic-development efforts;

- Offer training and educational programs; and
- Provide patent process assistance.

Assistance provided includes advice on processes, aid in securing patents, creating and testing prototype products, material testing, using industrial grade manufacturing equipment and computer assisted design (CAD) labs, and training for individuals or groups.

The inventor or manufacturer can benefit by getting fast assistance with the best processes and practices, gaining access to high tech precision equipment, working with an enthusiastic project team and achieving peace of mind with assistance on securing patents.

"Working with the Center is a simple process that starts with a contact from an inventor or manufacturer," Fields said. "If we think that we have a good fit between their needs and our capabilities, a project team of faculty and students is put together to work on their project."

The project teams benefit all parties involved. The learning environment of students in the academic programs is improved. Under the guidance of experienced faculty, students work on the development of real products using the same equipment that they will use after graduation. The students' experiences are enhanced through interaction with the inventors and business and industry personnel who make their livings from these products and provide jobs for the workforce that produces them. The constant interaction with industry also ensures that the technical curricula are kept current.

The new center is currently developing a Web site and an informational brochure to reach the manufacturers and inventors in southeastern Michigan.

For more information, contact: Eastern Michigan University, College of Technology, Center for Product Research and Development, Dr. Daniel Fields, Director, 118 Sill Hall, Ypsilanti, MI 48197; call (734) 487-2040 or e-mail CPRD@emich.edu.