

# CEAS Graduate Programs & Research Newsletter

## Reviewers Assess Grad Programs Self Study

The College of Engineering and Applied Science Graduate Programs Self Study was assessed by outside reviewers in December.

The Self Study examined CEAS' Graduate Programs from 1990 to 2002. The study included a review of the curriculum of each program,

the faculty, students, College resources, and various statistics from the 12-year period.

The reviewers of the Self Study were Dean Kummler of the College of Engineering at Wayne State University in Detroit, Michigan and Dean Lucas of the School of Engineering at the University of Alabama at Birmingham.

Dean Kummler and Dean Lucas assessed the College's Self Study during their visit to campus on December 8—10, 2003. They met with campus administration, CEAS administration, CEAS faculty, students, and alumni representatives.

During the exit interview, the reviews stated that they found CEAS faculty, students and alumni impressive. They also felt that the College thrives in success in several areas.

A draft report of the review is scheduled to be sent to UWM by mid January.

## National SBIR Conference

The application for UWM to co-host the 2006 National SBIR Conference in Milwaukee has been submitted and is pending approval. This is an exciting prospect for UWM to bring the SBIR Conference to Wisconsin. The Federal Government sets aside almost \$2 billion each year for research and development funding of small businesses. This is an excellent opportunity to cultivate more research and development in Milwaukee. The Spring 2005 Conference will be held in Omaha, Nebraska, and the Fall 2005 will take place in Albany, New York.

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## New Multicultural and Industry Expo

This year's Industry Expo will be joined with the annual Multicultural Career Fair. This winning combination has many great advantages for employers, students, and UWM. This new partnership is sponsored by the Career Development Center and CEAS Career Services.

The Multicultural and Industry Expo will be held on Thursday, February 19, 2004 from 9:00 am to 2:00 pm in the UWM Union Ballroom. Please help to promote this exciting event to all CEAS students. Any questions can be directed to CEAS Career Services, EMS e387.

### Benefits for Students:

Students will be exposed to a wide range of employers. By bringing a larger group of employers together, students will get the maximum exposure in the day.

### Benefits for UWM:

Collaboration is key! With a campus population of 24,000+ students, it takes a campus wide effort to educate, market, and prepare our students on-the-job search skills.

### Benefits for Employers:

Employers will be able to meet with the diverse student population UWM has to offer. The joint career fair will also be a more efficient use of corporate resources by saving recruiting time and company registration fees, and by having more exposure to students.

## Cyber Security Training January 5—16

By Joan Smothers

As a part of the Wisconsin Collaborating Campuses on Cyber Security Project, 21 faculty and students from five different UW System schools are participating in training at the Army Reserve Readiness Training Center at Fort McCoy, Wisconsin.

Institutions represented include UW-La Crosse, UW-Milwaukee, UW-Parkside, UW-Stevens Point, UW-Superior and Lac Courter Oreilles Ojibwa Community College. Participants were able to choose from two course selections, System Administrator/Manager Security or Computer Network Defense. For eight hours a day for ten days, attendees will receive lectures and computer practice on detecting and preventing security flaws.

**The System Administrator/Network Manager Security** course has the goal to train personnel to recognize vulnerabilities and defeat potential threats within the computer system and network; identify and repair common Windows 2000 (W2K) and UNIX operating system weaknesses; identify approved security-based software such as Computer Oracle and Password System (COPS), SPI for NT, SPI-NET, Tripwire, TCP Wrappers, etc; properly operate and maintain firewalls using routers and bastion hosts; operate and maintain a simple web server using MS Internet Information Server (HS); and identify specific fixes to real-world network situations.

*Please see Cyber Security, page 8*

## EMMP Class of 2004 Finishes Second Term

By Marc Mayerhoff

The Engineering Management Masters Program Class of 2004 finished their second term on December 20. They will return just under a month later for the third and final term, culminating in capstone design project presentations and commencement.

The classroom courses this term will be Legal Issues in Engineering Management, Managing Technological Innovation, and Operations

& Supply Chain Management. Additionally, they will also be working on their capstone design projects, under the supervision of CEAS Senior Lecturer John Dudek.

While they will participate in the May Commencement, they will present their final design projects on Friday, June 11. The exact time and location for those presentations are yet to be announced.

## CEAS Faculty Recipient of \$1.5 Million Grant

By Melody Clair

Dr. Arun Garg is the recipient of a \$1.5 million grant to investigate the risk factors of lower back pain. This three-year grant from the Centers for Disease Control and Prevention (CDC) and the National Institute for Occupational Safety and Health (NIOSH) is the result of a collaboration of CEAS' Ergonomic Laboratory; the Department of Family and Preventive Medicine, University of Utah; and the Health Science Center, Texas A&M University.

As PI of this study, Garg and his team will research occupational low back pain (LBP) and its relationship to on-the-job physical requirements, prevalence and incidence rates, measure individual risk factors that are associated with LBP, ascertain existing analysis methods, and develop a final model for determining LBP risk.

Approximately 700 workers from ten different industries in three different states will participate in this study. Objective measurements of job physical exposure will be used to maintain accuracy and maximize objectivity. All participants will be examined by physicians and physical therapists to maximize clinical and epidemiological validity and dependability.

This is the second award that Dr. Garg has received in collaboration with the University of Utah and Texas A&M University. A \$2 million grant was recently awarded to Garg and his team to research hand, wrist, forearm, and elbow injuries on the job.

## Faculty Research Resources

Research resources for CEAS faculty are now available on the CEAS website. Faculty can link to the online transmittal form in the Engineering Research Proposal Tracking Database, the Proposal Budget Form, and the Graduate Programs and Research Newsletter at <http://www.uwm.edu/CEAS/ResearchRes.html>.

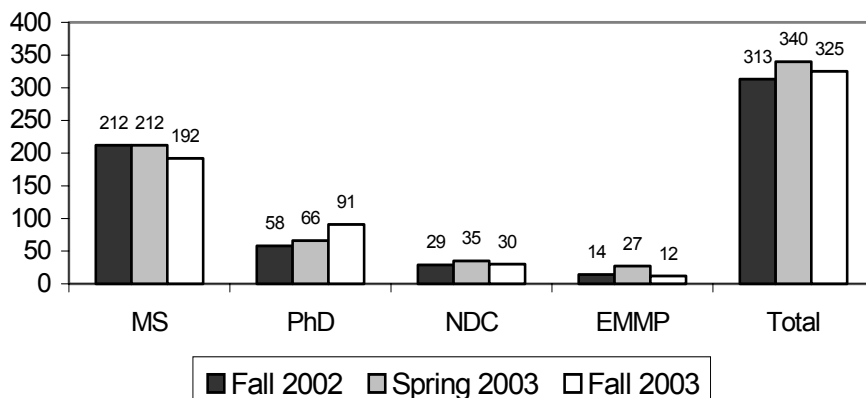
By accessing the Engineering Research Proposal Tracking Database, faculty can enter new proposals, update pending proposals, and track new and old proposals. This system is CEAS' preferred method for filling out and submitting T-forms.

## Black and Gold Committee

By Juli Levar

The Black and Gold Committee was established to improve the student experience at UW-Milwaukee. During spring semester 2003, all CEAS students were given an opportunity to identify the areas within the College that they would most like the CEAS Black and Gold Committee to explore. Based on that student feedback, action teams were formed in the areas of building, faculty, labs/technology and class scheduling. To get involved or for additional information, please visit: <http://www.uwm.edu/CEAS/blackandgold.html>

## Graduate Student Enrollment



## Proposals Submitted

### August 13, 2003 through December 12, 2003

Principal Investigator	Proposal	Amount
Abu-Zahra, N.	Measuring Polymer Melt Density and Viscosity in Real-Time during Foam Extrusion Processes using Ultrasound Sensors Fusion	\$111,888.00
Abu-Zahra, N. (Helwany, S.)	Innovative Method for Die Design in Foam Extrusion Processes	\$179,113.00
Amano, R.	Heat Transfer Studies of Heated Soil Vapor Extraction	\$26,000.00
Amano, R.	Remediation and Disinfection of Water Using HSVE and SC-CO <sub>2</sub> Technologies	\$50,000.00
Amano, R.	CFD Studies	\$10,000.00
Armstrong, B.	Machine Vision with Robust Landmark for Multi-Object Tracking in a Defined Space	\$156,249.00
Bravo, H.	Frequency Domain of Flow and Dispersion in Groundwater/Lake System in Wisconsin	\$66,545.00
Chen, J.	NER: Exploring High Yield Synthesis of Pure and Doped Tin Oxide Nanoparticles for Electronic Nose with a Commercial Gas Metal Arc Welder	\$118,075.00
Corzine, K.	IGBT Device Characterization	\$42,875.00
Ezenwa, B. (Helwany, S.; Pillai, K.)	Alleviating Prosthetic Socket Interface Pressure on Amputee Stump	\$316,700.00
He, X.	Integrating AFM/STM Microscopy into Nanotribology Teaching and Learning	\$99,930.00
He, X.	Theoretical Development for AFM Data Analysis	\$15,000.00
Helwany, S. (Titi, H.; Ghorbanpoor, A.)	Evaluation of Seismic Design Methods for GRS Segmental Walls	\$297,329.00
Horowitz, A.	Work Zone Incident Management Practices: Synthesis Study	\$21,808.00
Horowitz, A.	Portable Rumble Strips: Advanced Traffic Markings (ATM) and Recycled Technology, Inc. (RTI)	\$15,177.00
Horowitz, A.	Criteria for Portable ATIS in Work Zones: Lane Merge, Travel Time and Speed Advisory Systems	\$27,186.00
Hosseini, H. (Vairavan, K.)	A Laboratory for Computer Networks	\$199,747.00
Jang, J.	Investigation on System Configuration for Highly Efficient Water Fabrication Operations	\$299,844.00
Jang, J.	A Look-Ahead Dispatching Procedure for Mobile Servers	\$14,976.00
Jen, T.	Experimental studies in Drill Temperatures with Heat Pipe Cooling	\$12,000.00

## Proposals Submitted August 13, 2003 through December 12, 2003

Principal Investigator	Proposal	Amount
Jen, T.	Electrostatic-Force-Assisted Cold Gas Dynamic Spray (ECGDS) Coating Using Micro-and Nano-Powder	\$351,988.00
Jen, T.	Experimental and Theoretical Studies of HP DMFC-Hydrogen Peroxide Direct Methanol Fuel Cell	\$385,847.00
Jen, T.	Graphite Coating Metal Bipolar Plate for PEM Fuel Cell	\$375,847.00
Kim, K.	Development of an Implantable BioMEMS Device for Management of Neurogenic Bladder	\$325,745.00
Lee, J.	IMS Membership - Omron Corporation 1	\$35,000.00
Lee, J.	IMS Membership - United States Postal Service 2	\$35,000.00
Lee, J.	Title: Design an Optimal Reconfigurable Power Drive Assembly System in Product Mix Manufacturing Environment at Rockwell Automation	\$4,335.00
Pillai, K.	Controlling the Nanoparticle Orientation Through Flow to Create Improved Multiscale Hybrid Composites	\$99,527.00
Renken, K. (Reisel, J.)	Design and Implementation of a Multimode Heat Transfer Experiment for Use in Two Sequential Thermal Science Courses	\$5,000.00
Rohatgi, P.	Supplementary Support Under the NSF-REU Program to the Ongoing Project: Manufacture of Aluminum and Magnesium Matrix Composites under Industrial Conditions - Award No. INT-0222603	\$11,980.00
Rohatgi, P.	High Gravity Induced Functionally Gradient Structures in A1-BN Nanotube Composites	\$667,847.00
Rohatgi, P.	NER: Pressure Infiltration Synthesis of Aluminum- Alumina Nanocomposites	\$129,735.00
Rohatgi, P. (Amano, R.; Ghorbanpoor, A.)	Solidification Synthesis and Characterization of Metal Matrix - Nanoparticle and Nanotube Composites	\$1,996,807.00
Schroeder, P.	Collaborative Research: Adapting and Implementing a Course in Software Testing	\$49,635.00
Tabatabai, H.	Damage Detection in Instrumented Structures Using Precursor Transformation Method	\$251,303.00
Venugopalan, D.	Integrated Core Engineering Experience in an Urban Research University	\$99,309.00
Wang, W.	Radiation Tolerant Pipelined A/D Converter with Digital Calibration in Commercial CMOS Process	\$341,164.00
<b>TOTAL</b>		<b>\$7,246,511.00</b>

## Proposals Funded

### August 13, 2003 through December 12, 2003

Principal Investigator	Proposal	Agency	Amount
Amano, R.	Carbonating Flow Studies	UWM Foundation #8891.09	\$861.35
Christensen, E.	REU Supplement to existing NSF award (BES-0107402)	National Science Foundation	\$6,000.00
Garg, A.	Low Back Pain: Quantifying Risk Factors	Centers for Disease Control and Prevention (CDC)	\$1,499,833.00
Ghorbanpoor, A.	Graduate Internship Program - Briggs and Stratton 2	Briggs & Stratton	\$32,537.00
Lee, J.	Predictive Infotronics Agent for Integrated Product Life Cycle Support	NSF, INT - Central & Eastern Europe Program	\$107,798.00
Lee, J.	IMS Membership Fees	Rockwell Automation (Allen-Bradley, LLC); Mitsubishi Heavy Industries; Intel Corporation	\$105,000.00
Rahman, A. (Tabatabai, H.)	Simplified Design Procedures for Precast Hybrid Frames	PCI Precast/Prestressed Concrete Institute	\$18,000.00
<b>TOTAL</b>			<b>\$1,770,029.35</b>

## CEAS' Eight Masters Program Concentrations Approved

The Graduate School has approved CEAS' request for areas of concentration within the Masters Program to be designated on students' transcripts.

The approved concentrations consist of Civil Engineering, Engi-

neering Mechanics, Electrical and Computer Engineering, Engineering Management, Industrial and Management Engineering, Manufacturing Engineering, Materials Engineering, and Mechanical Engineering.

Identifying concentrations on students' transcripts will not only aid in departmental tracking, but will also increase employment opportunities for students. By listing the concentrations, students' work is specified, clearly outlining students' academic records for employers.

## 2003 and 2004 Graduate Applications

(As of December 12, 2003)

	Fall 2003	Spring 2004	Fall 2004	Totals
Ph.D. Candidates	33	29	22	<b>84</b>
PhD. Candidates w/o M.S	14	6	10	<b>30</b>
M.S Candidates	132	180	49	<b>361</b>
<b>Total</b>	<b>179</b>	<b>215</b>	<b>81</b>	

## New Grad Intern Brochure Available Soon

*By Joan Smothers*

The Graduate Programs and Research staff are continually working to promote the Graduate Internship Program to local employers. We are in our second printing of the Graduate Internship Brochure, and they should be available at the start of the spring semester.

Faculty can stop by EMS 387 for copies of the brochure to include in information packets when meeting with employers. If a faculty member has an interest in an employer, and would like us to contact the employer on their behalf, please let Dr.

Ghorbanpoor or Joan Smothers know.

Up-to-date information on the Graduate Internship Program can always be found at:  
[http://www.uwm.edu/CEAS/careerservices/employers/finding\\_grad\\_intern.html](http://www.uwm.edu/CEAS/careerservices/employers/finding_grad_intern.html)

Any interested employers can also be referred to this website or directly to Dr. Ghorbanpoor, 229-4962 or [algh@uwm.edu](mailto:algh@uwm.edu), or Joan Smothers, 229-2954 or [joans@uwm.edu](mailto:joans@uwm.edu).

## National Engineers Week

*By Juli Levar*

National Engineers Week is scheduled for February 22-28, 2004, and the College of Engineering and Applied Science invites you to participate in some of the activities scheduled for that week. Tentative events include: a competition among student organizations, volunteering at Discovery World, Mock Interviews, a Quiz Bowl and a Brown Bag Lunch Series. For additional information or to participate, please contact Joan Smothers at 229-2954 or [joans@uwm.edu](mailto:joans@uwm.edu).

## Materials Graduate Student Recipient of Multiple Scholarships

*By Melody Clair*

Andrew Borland, graduate student in materials engineering, is the recipient of multiple scholarships. Borland has recently received three scholarships, the David Laine Die Casting Scholarship from the North American Die Casting Association (NADCA), the Ronald W. Ruddle Memorial Scholarship from Foseco, and the Donald G. Brunner Scholarship from Waupaca Foundry, totaling \$6,500.

Borland was selected for these awards in support of his work and interest in die casting. Although he is knowledgeable in all cast metals, his main interest is in light metals. Borland recently presented a paper

at an NADCA conference evaluating the fatigue properties of die castings.

Participating in CEAS' Graduate Internship Program, Borland is currently working for Briggs and Stratton Corporation in their Materials Engineering Lab. This internship has given Borland exposure to an extensive array of metals, steels and polymers used in small engine production, which has fostered his interests in metals and has given him valuable experience while continuing his education. Borland will graduate in May 2004 with a Masters degree in Materials Engineering.



Graduate Student, Andrew Borland, will graduate in May of 2004.

## Cyber Security: *from page 2*

Topics include securing operating systems - W2K and UNIX - and operating environments; administration and security principles using W2K and UNIX; system administration tasks and functions needed for proper security maintenance such as auditing, password maintenance, encryption, authentication procedures, trusted hosts, root access pitfalls and techniques, virus protection, and common W2K/UNIX vulnerabilities; Risk Analysis tools and procedures; network security definitions, policies, and procedures as well as most common threats and vulnerabilities for modern networks; network management fundamentals and techniques; modern concerns for network security -

JAVA, CGI, viruses, IP spoofing, and hackers; firewalls, intrusion detection systems, and other protective measures; and virtual private networks (VPN).

**The Computer Network Defense** course is intended to train system administrators and network managers in advanced techniques of providing information defense protection on computer systems and networks. Topics to be covered include legal and ethical issues of intrusion defense, commonly overlooked security flaws in computer systems and networks, implementing encryption, post-intrusion actions, the methodologies of computer intrusions and using network perimeter

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defense tools to prevent, detect, analyze, and document intrusions and illegal activities.

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