

Department of Manufacturing and Industrial Technology

Ahmed H. ElSawy, Professor and Chairperson; Fred L. Vondra, Professor; Ismail Fidan, Associate Professor; and Ahmed K. A. Kamal, Assistant Professor; Barry L. Allison, Engineering Laboratory Technician; and Pauline R. Ward, Secretary III.

Mission Statement

The Department of Manufacturing and Industrial Technology offers a four-year baccalaureate degree program designed to prepare competitive individuals to succeed in the technical, managerial and manufacturing-supervisory type positions. Additionally, the Department supports the College, the University and the Community at large through academic activities, extended education courses, research, certification and professional development activities.

Year in Review

The academic year 2007-08 was a very successful year for the Department of Manufacturing and Industrial Technology's students, faculty, and staff. Although the department suffered a great deal after the death of Dr. Delbert Stone on February 17, 2008, our teamwork led to several successes and recognitions to our students and faculty. It is recognizable this year the continual increase in students' enrollment; students' academic achievement and national recognition; students successful extracurricular activities through professional organizations; laboratories' renovation and development; the amount of scholarships the students received; the successful addition to the fully online CAD, CNC, and RP courses to the MIT curriculum; faculty receiving research grants and publications of their research results in archived publications and professional meetings; and also offering NSF sponsored Rapid Prototyping (RP) as well as Programmable Logic Controllers (PLC) workshops to high school teachers, 2- and 4- years colleges faculty, and undergraduate and graduate students needing to sharpen their job-hunting skills. It is worth mentioning that last year the MIT saw a 13% increase and the college saw a 6% growth. The MIT average students' enrollment increased by 28%, which is great in comparison to the college growth.

Faculty, Staff and Student Accomplishments/Awards

Dr. Ismail Fidan

Dr. Fidan was one of Five TTU professors honored by TBR for innovation. He received recognition from the TBR's Distance Education Committee at the 12th Annual Distance Education Conference for their innovative uses of technology. Dr. Fidan is well known for distance delivery of hands-on engineering courses. He developed a remotely accessible lab for rapid manufacturing in cooperation with regional, state and national institutions. His innovative teaching methods include using YouTube for video demonstrations, implementing the Gallery Method for generating ideas, and developing sites on Moodle, a web-based course management system. Fidan has developed WebCT, iLearn and Moodle sites for CADD and Rapid Prototyping courses and offers these courses to distance students.

Students Accomplishments

Foundry Education Foundation Scholarships

Three MIT students, Daniel Dillon, Matt Webster and Blake Byrd, received \$1500.00 each scholarship awarded by the Foundry Education Foundation (FEF) at the Annual Meeting in Chicago

Society of Manufacturing Engineers Scholarships

Austin Pinkstaff awarded the 2007-2008 Society of Manufacturing Engineer's Myrtle & Earl Walker Scholarship, \$2,000

Austin Pinkstaff awarded the 2007-2008 Society of Manufacturing Engineer's Lee Severy Scholarship, \$1,500

TTU SME Chapter Awards

Golden Award in the Can Crusher Design Competition held at 2008 SME Leadership Conference

Third Place in the Manufacturing Poster Competition held at the 2008 SME Leadership Conference

MIT graduates exceed national, regional standards on NAIT Certification Examination

The Manufacturing and Industrial Technology graduates achieved a 95 percent pass rate on the most recent National Association of Industrial Technology Certification Exam and a 100 percent pass rate on last December's test. Those scores top the national average pass rate of about 65 percent and the average of about 62 percent scored by a 24-member peer group that includes Mississippi State, Iowa State, Central Michigan and Eastern Kentucky.

Innovations

Dr. Ahmed ElSawy

- Dr. ElSawy taught three ilearn assisted courses: MIT 3401- Machine Elements for Technologists, MIT 4620 – Industrial Projects, MIT 4990 – Special Problems and ME 3110 – Physical Metallurgy and Heat Treatment.
- Dr. ElSawy adopted new active learning/project base techniques by adding the Formula car and Moon buggy design, testing, and manufacturing to the lab portion of the MIT 3401-Machine Elements, MIT 4620-Industrial Projects and MIT 4990- Special projects classes.

Dr. Ismail Fidan

- Dr. Ismail Fidan managed to teach the MIT 3301 - Computer Aided Design and MIT 3060 – Computer Numerical Control totally online.
- Dr. Ismail Fidan developed Rapid Prototyping instructional materials for distance RP courses, developed Rapid Prototyping instructional and practice materials for K12, and organized Rapid Prototyping Workshops for STEM teachers and K12 students. These activities were the results of several NSF grants he received for this purpose.

New Equipment

The MIT bought some materials testing and metallographic lab equipment to improve the active learning in materials technology related courses in department.

Scholarly Publications and Presentations

Refereed Journals

Dr. Ahmed Kamal

- Ahmed Kamal, "Assessment of autonomic function in patients with Epilepsy using spectral analysis and coherence method", accepted to Neuroscience Journal, to be published in July 2008.

Dr. Ismail Fidan

- I. Fidan, N. Ghani, "Acquisition Steps of a Remotely Accessible Rapid Prototyping Laboratory," *International Journal of Computer Applications in Technology*, pp. 280-286, v. 30, n.4, 2007.

Conference Proceedings

Dr. Ahmed ElSawy

- ElSawy, "Sustainable Development of Structural Walls Incorporating Solid Waste Materials – Case Study", 3rd IMS International Conference for Applications of Traditional and High Performance Materials in Harsh Environments, School of Engineering, American University of Sharjah, Sharjah – UAE, January 23 – 24, 2008.
- K. M. Ibrahim, M. M. Ibrahim, A.A. Nofal and A.H. ElSawy, "Effect of Alloying Addition and Two-Step Austempering on Microstructure and Mechanical Properties of Ductile Iron," MDP-9.Conference, Mena-House Oberoi, Cairo, Egypt, January 8 - 10, 2008.

Dr. Ismail Fidan

- Fidan, A. Pinkstaff, F. Taban, "Innovative Delivery of MIT4450—Rapid Prototyping Course," 2008 ASEE Annual Conference, Pittsburgh, Pennsylvania, June 22-25, 2008.
- Anitsal, M. Meral Anitsal, I. Fidan, B. Barger, M. Allen, "An Exploratory Assessment of Distance and On-Ground Delivery of Business, Math and Engineering Technology Courses," 2008 ASEE Annual Conference, Pittsburgh, Pennsylvania, June 22-25, 2008.
- Fidan, O. Elkeelany, L. Goolsby, S. Serkownek, T. Dean, "Broadening Rapid Prototyping Awareness Via P16 STEM Teacher Workshops," 2008 ASEE Annual Conference, Pittsburgh, Pennsylvania, June 22-25, 2008.
- M. M. Anitsal, I. Anitsal, B. Barger, I. Fidan, M. R. Allen, "Student Evaluations of Course Attributes of Online Courses versus On-ground Courses: Impact of Student Personality Traits," Proceedings of the 2008 Allied Academies International Conference, Tunica, MS, April 2-4, 2008.

Dr. Fred Vondra

- M. A. Baswell, M.A. Abdelrahman, L. F. Vondra. A Multipurpose Instrument for Measurement of Green Sand Properties. American Foundry Society, Schaumburg, IL, AFS Transactions 2007, Paper 07-054 (04).

Books, Book Chapters

Dr. Ismail Fidan

- Fidan, "College and University Education and Research in Rapid Prototyping," 199-212, Wohlers Report 2008. -- Book Chapter
- The Handbook of Technology Management by John Wiley & Sons, Inc.--reviewed Wohlers Report 2008 by Terry Wohlers --edited Pro/ENGINEER@Wildfire 4.0 Instructor by Kelley, McGraw-Hill --reviewed

Graduate Thesis/Dissertations and other Student Publications

- Andrew Edmiston, "Improving Fatigue Properties of Austempered Ductile Iron" Austempering Process," M.S. Thesis in Mechanical Engineering, Tennessee Tech University, in Progress. (Ahmed EISawy, Co-Advisor with Dale Wilson)
- Albert Wilson, "Development of a Process for Production of Lightweight Aggregate from TVA Fly Ash," M.S. Thesis in Chemical Engineering, Tennessee Technology University, in Progress. (Ahmed EISawy, Co-Advisor with Joseph Biernacki).
- A. K. Vazrala, "Sintering of a Class F Fly Ash" M.S. Thesis in Chemical Engineering, Tennessee Technological University, in Progress. (Committee Member)

Student Presentations

- Lauren Addie, "Defect Simulation in Lost Foam Casting", This work was supported by the NSF grant number EEC-0552860, Research Experiences for Undergraduate (REU) Industrial Applications of Sensing, Modeling, and Control, under the supervision of Dr. Ahmed EISawy <http://www.tntech.edu/cmr/reu/pdfs/pdfs%2006/Addie%20poster.pdf>
- **Austin Pinkstaff and others** "Innovative Delivery of MIT4450—Rapid Prototyping Course," 2008 ASEE Annual Conference, Pittsburgh, Pennsylvania, June 22-25, 2008. In collaboration with Drs. Ismail Fidan and F. Taban.

Faculty research

Dr. Ahmed ElSawy

- PI, "Advanced Systems Development for a Remote Climbing Robot for Automating Welding Processes in the Ship Building Industry", Submitted to Robotic Technologies of Tennessee (RTT), through the Center for Energy Systems Research (\$20,000.00, pending)
- Co-PI with Dr. S. Canfield, "Development of a Remote Climbing Robot for Automating of Welding Processes in the Ship Building Industry", Submitted to Robotic Technologies of Tennessee (RTT), through the Center for Energy Systems Research (65,614.00, funded)

Dr. Ahmed Kamal

- PI, "Design of a Novel Tumor Detection System using Respiratory Information," Submitted to NIH –Exploratory Studies in Cancer Detection, Diagnosis and Prognosis Division through Center for Energy Systems Research. (\$ 214,000.00, pending)
- PI, Teaching/Learning Enhancement proposal, submitted to Quality Enhancement Plan, TTU, April 2008. (\$2,700.00, awarded)
- Co-PI with Dr. O. Elkeelany, "Multi-channel Novel Device for transmitting Biomedical data," Submitted to National Science Foundation, through center for Energy Systems Research. (\$180,000.00, pending)

Dr. Ismail Fidan

- Co-PI, STRATEGY: From Art to STEM- A Creative Journey of Discovery: A Transformational Project for Nashville Middle School Students, National Science Foundation, \$1,312,142.00, pending PI, Planning Grant, Tennessee Department of Education, Nashville Academy Inc., \$10,000.00, funded.
- External Project Evaluator, NSF WINSET Project -- Workforce Initiative for Nevada Students in Engineering and Technology, National Science Foundation, \$9,000.00, funded.
- PI, Critical Infrastructure of Hands-on Tele-manufacturing, TTU QEP Program, \$1,500.00, funded.
- PI, The Development of a Remotely Accessible Rapid Prototyping Laboratory, National Science Foundation, \$125,000.00, funded.
- Co-PI, Rapid Prototyping Instructional Delivery Support, National Science Foundation, \$829,911.00, funded.
- PI, Collaborative Research-Comparative Study of Online versus On-Ground Learning, Total Budget= \$38,045.00 (\$10,000: Tennessee Tech University-The Office of Research and \$28,045.00: Internal Matching from CESR, ISEE, College of Business, Mathematics Department and Distance MBA), July 1, 2007-June 30, 2009, funded.
- PI, Integrated Design and Manufacturing Practices between the Basic Engineering and Industrial Technology, \$1,300.00, Engineering Development Foundation, funded.
- (PI), Teaching/Learning Enhancement proposal, submitted to Quality Enhancement Plan, TTU, April 2008. (\$1,500.00, awarded).

Professional and Community Service

Dr. Ahmed ElSawy

- Served as TTU Sigma Xi chapter chair for the academic year 2007-08.
- Served as a judge at TTU's Students Research Day, April 1, 2008 and also the MIT students designed and manufactured the bronze medallion prizes awarded in this event.
- Continues to serve as a reviewer for the Technology Interface – The Electronic for Engineering Technology. <http://technologyinterface.nmsu.edu/>
- Continues to serve as a reviewer for the Journal of Materials Processing Technology, published by ELSEVIER.
- Advisor, Moon Buggy Tennessee Technological University Student Club.
- Advisor, Tennessee Technological University Saudi Club.
- Co-Advisor, Tennessee Technological University Formula SAE Team (with Dr. G. Johnson).
- Dr. ElSawy co-organized a trip for the Associate Vice President for Academic Affairs and the Associate Dean for College of Business to visit Arab Academy for Science and Technology, Alexandria Egypt, to explore the possibilities of academic co-operations in January 2008.
- Continues to serve as a liaison between the Cookeville Rotary Club and the sister Rotary Club – Metropolitan in Alexandria Egypt.

Dr. Ahmed Kamal

- Appointed as a Trustee for Epsilon Pi Tau Chapter (The International Honor Society for Professions in Technology) and reactivation of the TTU Chapter effective December 1, 2006.

Dr. Ismail Fidan

- Continues to serve as a reviewer for Robotica Journal, ASEE Journal of Engineering Technology, NAIT Journal of Industrial Technology, SME Journal of Manufacturing System, International Journal for Advanced Manufacturing Technology, ASEE 2008 conference, FIE 2008 conferences, IEEE Transactions on Electronics Packaging Manufacturing, and panel of NSF DUE CCLI Phase 2 and 3 proposals.
- Continues to serve as a chair in SME Electronics Manufacturing Technical Community, as a chair in SME's TEEM Award committee, and as a committee member in SME Automated Manufacturing and Assembly Community,
- Served as a program evaluator in an ABET re-accreditation visit to University of Memphis, TN representing SME, and as a program evaluator in an ABET re-accreditation visit to Point Part University/Pittsburgh, PA representing ASME.
- Advisor, SME Tennessee Technological University Student Chapter.

Dr. Fred Vondra

- Member and Past Grand Knight of Morris Council 6645 Knights of Columbus
- Currently, Special Deputy Sheriff, Putnam County Sheriff's Department
- Member and Past Director, Upper Cumberland Harley Owner's Group
- FEF Co-Leader, 2007 Capital Campaign
- Advisor, AFS Tennessee Tech University Student Chapter
- Advisor, Kappa Sigma Fraternity
- Member College of Engineering Academic Misconduct Committee