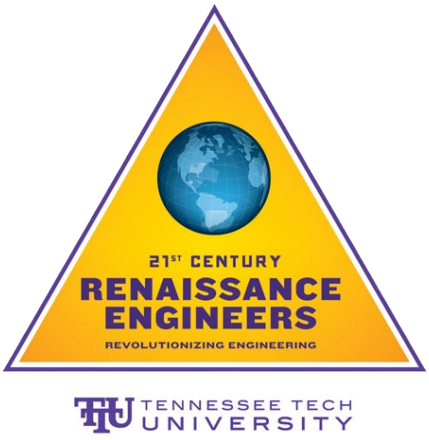

2020 Destination → Eminence

Department of Manufacturing and Engineering Technology
Annual Report 2014

Mission Statement
The Department of Manufacturing and Industrial Technology offers a four-year baccalaureate degree program designed to prepare technologists and applied engineering workforce dedicated to solving complex technological problems.

Renaissance Engineer Categories – As appropriate provide information.

Faculty and Staff

- 5 Faculty Members
- 2 Staff

Ahmed H. ElSawy, Professor and Chair	Ahmed Kamal, Associate Professor	Pauline Reyna, Administrative Associate 3
Fred Vondra, Professor	Awni Qasaimeh, Assistant Professor	Barry Allison, Academic Support Associate 7
Ismail Fidan, Professor	Larry Smith, Adjunct Faculty	

Enrollment & New Degree

I. Improve the Undergraduate Experience

- Since TBR approved the change of the Department name from Manufacturing and Industrial Technology to Manufacturing and Engineering Technology in 11/19/2013, the department enrollment increased to over 204 in fall 2013 and 231 in fall 2014 undergraduate students majoring in Engineering Technology. The program attracted international students from the Middle East, Europe and South America.
- The Department of manufacturing and Engineering Technology (formerly the Department of Manufacturing and Industrial Technology) started to prepare for ETAC of ABET accreditation. The department prepared and submitted a readiness review self-study in October 2014 and received a positive reply from ABET in January 2015.

Currently, the program requested an ABET visit in October 2015. A major changes and preparation of self-study have been made to achieve this endeavor. By obtaining ETAC of ABET, the MET department will share the other COE Departments success in improving the quality of engineering education at TTU. ABET accreditation will attract better students which will contribute to the COE and MET Department strategic plans of graduating 21st Century Renaissance Engineering Technologist who can solve technological challenges to meet societal needs.

II. Create Distinctive Programs and Invigorate Faculty

- The MET Department started to deliver the upper division of the 2+2 with Chattanooga State Community College to the VW employees staring Fall 2014.
- TBR approved the new PSM concentration in Manufacturing Sustainability in September 8, 2014. This innovative concentration came to fill the gap of knowledge needed for the Tennessee auto suppliers who Embraced E^3. The E^3 (Economy, Energy and the Environment) is an initiative jointly created by five Federal Agencies, including the Department of Energy, Environmental Protection Agency, Department of Labor, Small Business Administration and the Manufacturing Extension Partnership (MEP) of The National Institute of Standards and Technology, to help manufacturers implement Manufacturing Sustainability practices.

III. Student/Student Organization Awards & Achievements

Undergraduate Research Publications:

In response to the flight plan and COE strategic plan, the MET Department encourages the students to present and publish the results of their undergraduate research in national and international professional conferences and journals:

- **Matthew Holman, Chase Malone, Brian Katz** and Ahmed ElSawy, "Automation of Biodiesel Reactor for the Production of Biodiesel From WVO Using PLC & Small Scale Continuous Ultrasonic Processor", Proceedings of the 2014 IAJC/ISAM Joint International Conference (ISBN 978-1-60643-379-9), September 25-27, 2014 – Orlando, Florida.
- **Michael Kronland, Nicholas Leak, Joseph Randall, Cory Womack,** and Ahmed Elsawy "An Investigation into Combined Concentrated Photovoltaic and Fluidic Thermal Extraction in Harnessing the Power of Sun", IYCE'15 – 5th International Youth Conference on Energy, 27-30 May 2015, Pisa, Italy, Presenter: N.B. Leak (Tennessee Technological University - Funded by URECA and COE Success Center).

IV. Professional Activity Summary

1. Journal Publications Published

Chase Malone; Matthew Holman; Brian Katz; **Ahmed ElSawy**, "Automation of a Biodiesel Reactor for the Production of Biodiesel from WVO Using a PLC and a Small-Scale Continuous Ultrasonic Processor", Technology Interface International Journal, pp 5-10, VOL. 15, No. 1, Fall/Winter 2014.

- **I. Fidan**, "Academic Activities and Capabilities in Additive Manufacturing," pp. 213-234, *Wohlers Report 2014. (Book Chapter), ISBN: 978-0-9913332-0-2.*
- M. Anitsal, I. Anitsal, B. Barger, **I. Fidan**, "Service Learning Across Disciplines and Countries," *Atlantic Marketing Journal*, Volume: 3, Issue: 2, Article: 10, 2014. Awni Qasaimeh, S. Hamasha, Y. Jaradat and P. Borgesen "**Damage Evolution in Lead Free** Solder Joints in Isothermal Fatigue" J. Electron. Packag. 137(2), doi: 10.1115/1.4029441.
- Sa'd Hamasha, **Awni Qasaimeh**, Younis Jaradat and Peter Borgesen, "**Correlation between Solder Joint Fatigue Life and Accumulated Work in Isothermal Cycling",** IEEE Transactions on Components, Packaging and Manufacturing Technology (under review).
- **Awni Qasaimeh**, S. Hamasha, Y. Jaradat and P. Borgesen "**Damage Evolution in Lead Free Solder Joints in Isothermal Fatigue**" **J. Electron. Packag. 137(2), doi: 10.1115/1.4029441.**
- Sa'd Hamasha, Jaradat Younis, **Awni Qasaimeh**, Mazin Obaidat, and Peter Borgesen, "**Assessment of Solder Joint Fatigue Life Under Realistic Service Conditions**", Journal of Electronic Materials, 12/2014, Volume 43, Issue 12, pp 4472-4484.
- **Ahmed Kamal**, "Novel Method to assess Autonomic Function in health and disease: an application to Epileptic Patients', International Journal of neuro rehabilitation, 1,133, Dec 2014.

2. Conference Presentations and Publications

- Matthew Holman, Chase Malone, Brian Katz and **Ahmed ElSawy**, "Automation of Biodiesel Reactor for the Production of Biodiesel From WVO Using PLC & Small Scale Continuous Ultrasonic Processor", Proceedings of the 2014 IAJC/ISAM Joint International Conference (ISBN 978-1-60643-379-9), September 25-27, 2014 – Orlando, Florida.
- Lauren J. Addie, **Ahmed H. ElSawy**, Sally Pardue, and Mohamed Abdelrahman "Defect Simulation of Aluminum Silicon 319 Alloy in Lost Foam Casting - a Summer Research Experience for Undergraduates", Proceedings of the 121st ASEE Annual Conference & Exposition, Indianapolis, IN, June 15-16, 2014.
- **Ismail Fidan**, "Integrating the Energy Efficiency and Assessment Components into Manufacturing," *2014 ASEE Annual Conference*, Indianapolis, IN, June 15-18, 2014.
- **Ismail Fidan**, "Distant AM Practices," NSF Additive Manufacturing Workshop, NSF Headquarter, Arlington, VI, pp. 89-93, April 10-11, 2014. - Invited Presentation and Publication
- **Ismail Fidan**, "Integrating the Energy Efficiency and Assessment Components into Manufacturing," 2014 ASEE Annual Conference, Indianapolis, IN, June 17, 2014.
- **Ahmed Kamal** 'Autonomic Function assessment in Diabetic patients using dynamic nonlinear methods" Published at Biomedical Engineering society Conference Proceeding held in San Antonio, Texas October 2014.

3. Presentations

- Ismail Fidan, "Manufacturing Engineering Technology Programs and ABET Accreditation: Impact of Changes," SME Webinar, May 16, 2014.

- Ismail Fidan, "AM Applications in Automotive Industry," Regional I/UCRC Meeting, TTU, Tech Pride Room, Cookeville, TN, April 25, 2014.
- Ismail Fidan, "Distant AM Practices," *NSF Additive Manufacturing Workshop*, NSF Headquarter, Arlington, VI, April 11, 2014.

V. Research Proposals Submitted

1. Ismail Fidan, Co-PI, RapidTech-National Center for Additive Technologies, National Science Foundation, $4,999,925.00, July 1, 2014-June 31, 2018. – Pending.
2. Ismail Fidan, Senior Personnel, Continuum of Peace: Bridging Cultures through Peace Education, $50,000.00, Peace Projects Grant Program. – Pending.
3. Ismail Fidan, (PI) Project ILE-Building Innovation, Leadership, and Entrepreneurship via Critical Thinking and Real Life Problem Solving Skills, TTU QEP Program, $4,5000.00, August 1, 2014-July 31, 2015. –*active in 2014*
4. Senior Faculty Investigator, Continuum of Peace: Bridging Cultures Trough Peace Education, $50,000.00, Peace Projects Grant Program. – *pending*
5. Ismail Fidan, Co-PI, Integrating Research in Robotics, Controls, Bio Mechanical Sensing and Additive Manufacturing into engineering education through the EIME model (Merging Assistive).
6. Ismail Fidan, Technology for Children and Mechanical Engineering), TBR Research Initiation Grant Program, $50,000.00. – *Declined*.
7. Ismail Fidan (PI) ENG IUSE Ideas Lab: Using Additive Manufacturing as a Tool in the Development of a Service Learning Paradigm to Prepare the STEM Students for Tomorrow's Workforce, Pre-proposal. – *Declined*
8. Ismail Fidan and Ahmed Elsawy, "TTU Online Renewable Energy Education Initiative", TTU Office of Research, $10,000.00, August 1, 2012-July 31, 2013. Extended to 2014 (with Dr. Fidan).
9. Ahmed ElSawy (PI) – "NSRP ASE Technology Investment Agreement No. 2012-445 – Expanding the Range of Applications for the MRMS for Mechanizing Manufacturing Processes in the Ship Building Industry Project" Phase III (09/30/13-03/20/14) $6,003.
10. Ahmed ElSawy, SMAC funds/Chapter 606 – NASA Moonbuggy Team Project, $8,292.00.
11. Ahmed ElSawy Dean's Office Moonbuggy's Fund for NASA Competition, $4,000.
12. Ahmed ElSawy President's Oldham Solar Powered Golf Cart, $7,000.00.
13. Awni Qasaimeh, Participated as a senior personnel in an NSF REU proposal entitled: Summer Research Internships in Manufacturing and Techno-Entrepreneurship Preparation", funded.
14. Awni Qasaimeh, submitted NSF-NUE proposal entitled: Integrating Nano-reliability, quality and statistics for nanomanufacturing into undergraduate engineering education at Tennessee Technological University, Rejected
15. Ahmed Kamal, The University Quality Enhancement Plan (QEP) Committee has recommended funding for your Spring, 2014 QEP proposal listed below at the amount listed: $4800.00.

VI. Editors/Associate Editors of Journals

Journal Editorial Board

a. A. ElSawy serves on the editorial board for the International Journal for Modern Engineering.
b. Dr. I. Fidan is the Associate Editor of IEEE Transactions on Components, Packaging and Manufacturing Technology-managed 9 manuscripts.
c. Fidan is Associate Editor of American Journal of Engineering Education-managed 3 manuscripts.

VII. Professional Society Fellows

Officers of Professional Societies

a. A. ElSawy, Association of Technology, Management, and Applied Engineers - Vice Chair of Research & Development (2013-2016)
b. A. ElSawy, Association of Egyptian American Scholars (AEAS) – Vice President (2013-15).
c. I. Fidan is the Membership consultant for SME (2003-2006, 2011-Present)
d. I. Fidan is Associate Program Chair, ASME Manufacturing Division (2013-Present)
e. I. Fidan is the ABET Engineering Technology Commissioner through SME (since 2013).

VIII. Press Releases

a. "MET Professor Fidan Attends Lean Manufacturing Conference," Tech Times, October, 2014, https://www.tntech.edu/engineering/news-events/news/2014-2015-coe-news/met-professorfidan-attends-lean-manufacturing-conference
b. "Fidan Receives SME Award of Merit," Tech Times, July, 2014, https://www.tntech.edu/engineering/news-events/news/2014-2015-coe-news/fidan-receivessme-award-of-merit
c. "CoE's Fidan Returns from Oak Ridge," Tech Times, January, 2014, https://www.tntech.edu/engineering/news-events/news/2013-2014-coe-news/coes-fidanreturns-from-oak-ridge

XI. Faculty Recognition and Appointments

a. Fred Vondra was appointed as VW program coordinator.
b. Ismail Fidan was recognized by the COE as Faculty Fellow in Innovation and Techno-Entrepreneurial
c. Ismail Fidan received the 2014 SME Award of Merit
d. Ismail Fidan 2014 TTU College of Engineering Teacher Scholar Award

IX. Eminence Awards Students' Recognition

a. **Outstanding Senior**
Matthew Shepard
b. **Outstanding Innovation:** Husain Almahasnah, Scott A. Hawn, & Pamela Smith, Manufacturing for their innovation in Senior Projects entitled: "Developing and testing an efficient waste-to-energy gasification apparatus for the production of syngas".
c. Bachelor of Science Best Paper

Paris Cornwell for his presentation entitled "Determination of a Scaling Factor for Use in an Electron Beam Melting Additive Manufacturing Machine" in SME's Rapid 2013 Conference on Rapid Prototyping and Additive Manufacturing which took place June 10-13, 2013 in Pittsburgh, PA.

d. **Outstanding Undergraduate Research:**
Scott A. Hawn, Pamela Smith, & Hussain Almahasnah, for their outstanding undergraduate research in **"**Developing and testing an efficient waste-to-energy gasification apparatus for the production of syngas".

e. Doctor of Philosophy Best Paper
Chinyere Mbachu (Chemical Engineering) for her contribution to the MET students' research paper entitled: "Justin Wood, Jared Slayton, Seth Parrott, Chinyere Mbachu, and Ahmed ElSawy, " Production of Biodiesel from WVO Using Small Scale Continuous Ultrasonic Processor", International Conference on Renewable Energies and Power Quality (ICREPQ'13), Bilbao (Spain), 20th- to 22th March, 2013".