Constantine M. Tarawneh

Tel: (956) 665-2607 Fax: (956) 665-3527
E-mail: tarawneh@utpa.edu
Web Site: http://mece.utpa.edu/~tarawneh

Education

University of Nebraska-Lincoln (UNL) **August 1996 – August 2003**

- Ph.D. Mechanical Engineering, August 2003, GPA 3.96.
  - Dissertation title: "Experimental Analysis of Near-Field Acoustic Scattering by Rigid Spheroidal Objects", *Advisor: Dr. John P. Barton.*
- M.S. Mechanical Engineering, December 1999, GPA 3.75.
  - Thesis title: "Experiments with a Mass Transfer Analog for the Filling of Stratified Thermal Energy Storage", *Advisor: Dr. Kelly O. Homan.*

University of Jordan-Amman **September 1991 – January 1996**

- B.Sc. Mechanical Engineering, January 1996, finished within the top five percent in class.
  - Senior Design Project title: "Measurement of Bond Conductance in Solar Collector Absorber Plates", *Advisor: Dr. Ali Badran.*

Professional Employment

The University of Texas-Pan American (UTPA) **August 2003 – Present**

Associate Professor, Mechanical Engineering Department **August 2009 – Present**

Assistant Professor, Mechanical Engineering Department **August 2005 – August 2009**

Lecturer, Mechanical Engineering Department **August 2003 – August 2005**

Duties Performed:

- Teaching graduate and undergraduate courses in mechanical engineering.
- Supervising and instructing the Heat Transfer and Fluid Mechanics Laboratories.
- Supervising several senior design projects.
- Co-advised the aero-design team for two years.
- Performing duties of Mechanical Engineering Graduate Program Director for the past seven years.
- Performed duties of Mechanical Engineering Undergraduate Program Director for two years.
- Performing duties of Global Security Studies and Leadership Graduate Program Director.
- Performing duties of Global Security Studies Undergraduate Minor Program Director.
- Serving in five departmental committees, two college committees, and three university committees.
- Serving as Chair of the College of Engineering and Computer Science Council.
- Served as Chair of the University Admissions Committee for three years.
- Served as Chair of the University Graduate Council for two years.
- Serving in the University Undergraduate Curriculum Committee.
- Serving in the University Merit Task Force.
- Advising 150 to 200 students each semester.
- Involved in the LSAMP and BRIDGE student mentoring programs.

University of Nebraska-Lincoln (UNL) **August 1996 – Present**

Visiting Summer Sessions Faculty, Mechanical Engineering Department. Duties include:

- Teaching thermal sciences and engineering mechanics courses.
- Collaborating with faculty in research in the fields of Heat Transfer and Acoustics and Vibrations.

Research Assistant, Mechanical Engineering Department. Duties included:

- March of 2002, provided engineering consulting through UNL for Snyder Industries, Inc. in Lincoln, NE. The project involved conducting heat transfer related testing and modeling.
- July through September of 2001, performed systematic analysis of the electromagnetic interaction of the monochromatic light with aerosol particles of spheroidal and near-spheroidal geometries. The project was funded through a $25,000 grant from the Naval Research Laboratory (NRL) in Washington DC.
- May of 1998 through September of 2000, worked on a $100,000 grant from ASHRAE. The project involved studying Stratified Thermal Storage Systems and providing design improvements to increase their efficiency.

Teaching Assistant, Mechanical Engineering Department. Duties included:

- August of 1999 through May of 2003, supervised and instructed the Measurements Laboratory.
- August of 1999 through August of 2003, assisted undergraduate students in their senior design projects.
- August of 1996 through May of 2003, teaching assistant for the Thermodynamics course.
- January of 1997 through May of 1998, instructed the Thermal Fluids Laboratory.

Mathematics, Physics, and Engineering Tutor **September 1991 – August 2003**

- Tutored High School students and University undergraduates in Mathematics, Physics, and Engineering, including Calculus, Statics, Dynamics, Linear Algebra, Strength of Materials, Mechanical Design, Thermodynamics, and Heat Transfer.

Aeroklima, Air Conditioning Systems Design, Thessaloniki, Greece

May 1995 – August 1995

Mechanical Engineer

- Only student selected to join and contribute to team of professionals in projects to design, build, and install air conditioning systems.

Research Activities

Total Funding To-Date as PI and Co-PI → $4,715,109

Proposals Funded as PI – Total Funding of $1,918,648

1. "Amsted Rail Research Projects: SmartPad™ Development and Product Enhancements and Testing", Amsted Industries Inc., **$530,656**. **(2011)**
2. "Amsted Rail Research Projects: Product Enhancements and New Technologies: Part II", Amsted Industries Inc., **$518,431**. **(2010)**
3. "Amtrak-Amsted Research Projects: Lateral Damper System Development and Testing", Amtrak through Amsted Industries Inc., **$41,000**. **(2010)**
4. "Amtrak-Amsted Research Projects: Hydraulic Damper System Development and Testing", Amtrak through Amsted Industries Inc., **$172,000**. **(2010)**
5. "Adapter Polymer Pad Material Characterization: Electric Conductivity Study", Amsted Industries Inc., **$28,488**. **(2010)**

6. "Amsted Rail Research Projects: Product Enhancements and New Technologies", Amsted Industries Inc., **$273,985**. **(2009)**
7. "Hydraulic Damper Orifice Valve Design: Spool Design", Amsted Industries Inc., **$17,088**. **(2009)**
8. "Hydraulic Damper Orifice Valve Design: Initial Analysis", Amsted Industries Inc., **$18,500**. **(2008)**
9. "A Theoretical and Experimental Performance Study of the Modified Polyamide Cage Cone Assemblies and Implementation of an On-Track Field Test to Verify the Laboratory Findings of the Bearing Temperature Trending Study", Amsted Industries Inc., **$130,000**. **(2008)**
10. "An Investigation into the Heat Transfer from a Railcar Wheel to the Bearing Cup", BRENCO QBS, **$56,000**. **(2008)**
11. "Material Characterization of Modified Polyamide Cages", BRENCO QBS, **$5,000**. **(2008)**
12. "Renewable Energy Awareness Workshop", Center for Integrated Global Knowledge and Understanding at UTPA, Internal Proposal, **$5,000**. **(2007)**
13. "An Experimental and Analytical Study of the Vibration Effects on Tapered-Roller Bearings in Service", BRENCO QBS, **$60,000**. **(2007)**
14. "Designing an Experimental Setup to Test the Fabricated NGN^{TM} Valve Prototypes", SumNett Inc., **$7,500**. **(2006)**
15. "An Investigation of the Mechanism Leading to the Sudden Overheating of Railroad Tapered Roller Bearings", BRENCO QBS, **$40,000**. **(2006)**
16. "Heat Transfer Modeling of Railroad Tapered Roller Bearings", BRENCO QBS, **$15,000**. **(2005)**

Proposals Funded as Co-PI – Total Funding of $2,796,461

1. "Multimodal Modules for Inquiry-Based Statics and Dynamics Curriculum", NSF CCLI proposal, **$199,974**. **(2009) (PI: Dr. Javier Kypuros)**
2. "Material Characterization of Modified Polyamide Cages: Part III", BRENCO QBS, **$24,728**. **(2009) (PI: Dr. Robert Jones)**
3. "Viscoelastic Characterization of Candidate Seal Material and Design: Part II", BRENCO QBS, **$41,082**. **(2008) (PI: Dr. Robert Jones)**
4. "Viscoelastic Characterization of Seal Material", BRENCO QBS, **$30,677**. **(2007) (PI: Dr. Robert Jones)**
5. "Proposal to Establish an Intelligence Community Center of Academic Excellence", DoD, **$2.5 million** over five years. **(2006) (PI: Dr. Van Reidhead)**

Other Research Activities

- Worked on the mechanical design aspects of an NSF funded project as part of a team with faculty from the Biology and Chemistry Departments. The project proposes a laboratory based PIXE, (PIXE-L), using a ^{244}Cm alpha excitation source, for the analysis of the concentrations and transport of metal ions in live plants, which is the first of its kind. PIXE-L requires low path-length dimensions in order to minimize the loss of the He^{2+} ions and the fluoresced x-rays. The design of the ^{244}Cm source holder takes into consideration the calculated optimized source-target x-ray detector geometries, the ease of installation of the sources at Oak Ridge National Laboratory (ORNL), and the ease of manipulation while ensuring the necessary radiation protection of the device. The project was funded by NSF through a three year (12/1/03-11/30/06) **$767,000** grant.

Books

- C. Tarawneh. Near-Field Acoustic Scattering by Rigid Spheroidal Objects. VDM, Germany, 2009. **[ISBN 978-3-639-18564-5]**.

Journal Papers

1. C. Tarawneh, R. Maldonado, A. A. Fuentes, and J. A. Kypuros. A vibration energy approach for identifying temperature trending in railroad tapered roller bearings. *Int. J. Acoustics and Vibration*, to be submitted, February 2012.
2. C. Tarawneh, A. A. Fuentes, J. A. Kypuros, L. A. Navarro, A. G. Vaipan, and B. M. Wilson. Thermal modeling of a railroad tapered roller bearing using finite element method. *Journal of Thermal Science and Engineering Applications*, accepted for publication (in press), January 2012.
3. C. Tarawneh. An effective homework methodology. *Journal of Applications and Practices in Engineering Education*, accepted for publication (in press), December 2011.
4. C. Tarawneh, L. Koester, A. J. Fuller, B. M. Wilson, and J. A. Turner. Lifetime testing of components with defects in the rolling contact fatigue zone. *Journal of ASTM International*, paper accepted for publication on November 18th, 2011.
5. J. A. Kypuros, C. Tarawneh, H. Vasquez, M. Knecht, and R. Wrinkle. Guided discovery modules for engineering mechanics. *Journal of Applications and Practices in Engineering Education*, Vol. 2, No. 1, 2011.
6. K. D. Cole, C. Tarawneh, A. A. Fuentes, B. M. Wilson, and L. Navarro. Thermal models of railroad wheels and bearings. *Int. J. of Heat Mass Transfer*, Vol. 53, pp. 1636-1645, 2010.
7. C. Tarawneh, H. Vasquez, L. Navarro, V. Reyna, M. Acosta, and V. Reidhead. Renewable energy prospects and feasibility for isolated communities. *Int. J. of Energy for a Clean Environment*, Vol. 10, No. 1-4, pp. 73-101, 2009.
8. K. D. Cole, C. Tarawneh, and B. M. Wilson. Analysis of flux-base fins for estimation of heat transfer coefficient. *Int. J. Heat Mass Transfer*, Vol. 52, pp. 92-99, 2009.
9. C. Tarawneh, K. D. Cole, B. M. Wilson, and F. Alnaimat. Experiments and models for the thermal response of railroad tapered roller bearings. *Int. J. Heat Mass Transfer*, Vol. 51, pp. 5794-5803, 2008.
10. C. Tarawneh and K. O. Homan. Measurements of density profile evolution during the stably-stratified filling of an open enclosure. *Int. J. Heat Fluid Flow*, **29** (4): 1113-1124, August 2008.
11. C. Tarawneh and J. P. Barton. Experimental analysis of near-field acoustic scattering by rigid spheroidal objects. *Int. J. Acoustics and Vibration*, **12** (4): 162-170, December 2007.
12. J. P. Barton, N. L. Wolff, H. Zhang, and C. Tarawneh. Near-field calculations for a rigid spheroid with an arbitrary incident acoustic field. *Journal of the Acoustical Society of America*, **113** (3): 1216-1222, March 2003.
13. C. Tarawneh and K. O. Homan. Observations of interfacial mixing during the stably-stratified filling of an open chamber. *DFD99 Meeting of the American Physical Society*, 1999.

Refereed Conference Papers

1. Fuentes, C. Tarawneh, J. A. Kypuros, A. Zagouris, A. P. Arguelles. Experimentally validated FEA of railroad bearing adapter operating temperatures. Abstract accepted for the *2012 ASME Summer Heat Transfer Conference*, **HT2012-58489**, Puerto Rico, USA, July 8-12, 2012.
2. J. A. Kypuros, H. Vasquez, C. Tarawneh, M. Knecht, and R. Wrinkle. Lessons Learned Implementing and Optimizing Guided Discovery Modules. *Proceedings of the 2012 Frontiers in Education Conference*, Seattle, Washington, 2012.
3. J. A. Kypuros, C. Tarawneh, A. Zagouris, S. Woods, B. M. Wilson, and A. Martin. Implementation of wireless temperature sensors for continuous condition monitoring of railroad bearings. *Proceedings of the 2011 ASME RTD Fall Technical Conference*, **RTDF2011-67017**, Minneapolis, Minnesota, September 21-22, 2011.
4. J. A. Kypuros, H. Vasquez, C. Tarawneh, M. Knecht, and R. Wrinkle. Guided discovery modules for statics and dynamics. *Proceedings of the 2011 ASEE Annual Conference and Exposition*, Vancouver, BC, Canada, June 26-29, 2011.
5. C. Tarawneh, J. A. Kypuros, A. A. Fuentes, B. M. Wilson, B. A. Gonzalez, G. Rodriguez, and R. K. Maldonado. Vibration signatures of temperature trended bearings in field and laboratory testing. *Proceedings of the 2009 ASME RTD Fall Technical Conference*, **RTDF2009-18038**, Ft. Worth, Texas, October 20-21, 2009.

6. S. W. Crown, A. A. Fuentes, C. Tarawneh, R. A. Freeman, and H. Mahdi. Student academic advisement: Innovative tools for improving minority student attraction, retention, and graduation. *Proceedings of the 2009 ASEE Annual Conference and Exposition*, Austin, Texas, June 14-17, 2009.
7. C. Tarawneh, A. A. Fuentes, B. M. Wilson, K. D. Cole, and L. Navarro. Thermal analysis of railroad bearings: effect of wheel heating. *Proceedings of the 2009 ASME Joint Rail Conference,* **JRC2009-63055**, Pueblo, Colorado, March 3-5, 2009.
8. C. Tarawneh, J. A. Kypuros, B. M. Wilson, T. W. Snyder, B. Gonzalez, and A. A. Fuentes. A collaborative on-track field test conducted to verify the laboratory findings on bearing temperature trending. *Proceedings of the 2009 ASME Joint Rail Conference,* **JRC2009-63056**, Pueblo, Colorado, March 3-5, 2009.
9. J. A. Kypuros and C. Tarawneh. Scalable, inquiry-based, multimodal modules for engineering mechanics curriculum. *Proceedings of the 38th ASEE/IEEE Frontiers in Education Conference*, **Session T3A**, Saratoga Springs, New York, October 22-25, 2008.
10. C. Tarawneh, B. M. Wilson, K. D. Cole, A. A. Fuentes, and J. M. Cardenas. Dynamic bearing testing aimed at identifying the root cause of warm bearing temperature trending. *Proceedings of the 2008 ASME RTD Fall Technical Conference,* **RTDF2008-74036**, Chicago, Illinois, September 24-26, 2008.
11. C. Tarawneh, B. M. Wilson, K. D. Cole, and M. Reed. A metallurgical and experimental investigation into sources of warm bearing trending. *Proceedings of the 2008 IEEE/ASME Joint Rail Conference,* **JRC2008-63028**, Wilmington, Delaware, April 22-24, 2008.
12. C. Tarawneh, K. Cole, B. Wilson, and K. Freisen. A lumped capacitance model for the transient heating of railroad tapered roller bearings. *Proceedings of the Annual ASEE-GSW Regional conference*, **T2C5**, South Padre Island, TX, March 28-30, 2007.
13. C. Tarawneh, H. Vasquez, and M. A. Acosta. An experimental study of potential residential and commercial applications of small-scale solar power systems. *Proceedings of the Annual ASEE-GSW Regional conference*, **T3C4**, South Padre Island, TX, March 28-30, 2007.
14. J. A. Kypuros and C. Tarawneh. Multimodal assessment instruments for dynamics. *Proceedings of the Annual ASEE-GSW Regional conference*, **T3B5**, South Padre Island, TX, March 28-30, 2007.

Non-Refereed Conference papers

1. N. Dasgupta-Schubert, M. Persans, C. Tarawneh, C. Schubert, M. A. Reyes, T. Brandt and C. Lloren. Live plant PIXE imaging and XRFS: design optimization, component fabrication and estimated x-ray photon count rate. *The 108th Annual Meeting of the Texas Academy of Sciences*, The University of Texas-Pan American, March 3-5, 2005.
2. N. Dasgupta-Schubert, C. Tarawneh, M. Persans, T. Brandt and C. Lloren. Bio-chemical PIXE spectrometry: fabrication of the 244Cm source holder. *Third Annual Research Symposium of the South Texas Section of the American Chemical Society*, The University of Texas-Pan American, Edinburg, TX 78539, November 12th, 2004.

Patent Applications

- A US Patent Application entitled "Methods and Systems for Analyzing Samples Using Particle Irradiation", Constantine Tarawneh *et al*, was filed on March 2nd, 2007 by Fulbright and Jaworski in Austin, TX **[Application No. 11/681,613]**.

Professional Presentations

1. C. Tarawneh. Implementation of Wireless Temperature Sensors for Continuous Condition Monitoring of Railroad Bearings. *ASME RTDF Technical Conference*, Minneapolis, MN, September 21-22, 2011.
2. C. Tarawneh. Thermal Analysis of Tapered Roller Bearings Tested at UTPA. Invited speaker for the *Annual Research and Development Meeting of Amsted Industries Incorporated*, held in Petersburg, VA, October 5-6, 2010.

3. C. Tarawneh. Thermal and Dynamic Performance of Bearings with Cone Assembly Modifications Designed to Minimize Temperature Trending Events. Invited speaker for the *Annual Research and Development Meeting of Amsted Industries Incorporated*, held in Petersburg, VA, November 5-6, 2009.
4. C. Tarawneh. Vibration Signatures of Temperature Trended Bearings in Field and Laboratory Testing. *ASME RTDF Technical Conference*, Ft. Worth, Texas, October 20-21, 2009.
5. C. Tarawneh. A Collaborative On-Track Field Test Conducted to Verify the Laboratory Findings on Bearing Temperature Trending. *ASME Joint Rail Conference*, Pueblo, Colorado, March 3-5, 2009.
6. C. Tarawneh. Thermal Analysis of Railroad Bearings: Effect of Wheel Heating. *ASME Joint Rail Conference*, Pueblo, Colorado, March 3-5, 2009.
7. C. Tarawneh. Dynamic Bearing Testing Aimed at Identifying the Root Cause of Warm Bearing Temperature Trending. *ASME RTDF Technical Conference*, Chicago, Illinois, September 24-26, 2008.
8. C. Tarawneh. A Metallurgical and Experimental Investigation into Sources of Warm Bearing Trending. *IEEE/ASME Joint Rail Conference*, Wilmington, Delaware, April 22-24, 2008.
9. C. Tarawneh. Understanding Bearing Temperature Trending and Possible Means of Reducing its Occurrence. Invited speaker for the *Annual Research and Development Meeting of Amsted Industries Incorporated*, held in Petersburg, VA, March 16-17, 2008.
10. C. Tarawneh and J. A. Kypuros. Multimodal Modules for Non-Calculus-Based Engineering Mechanics Curriculum. *Border, National and Global Security Conference*, Edinburg, TX, February 22, 2008.
11. C. Tarawneh. An Analytical and Experimental Study of the Vibration Effects on the Performance of Tapered Roller Bearings during Service. Invited speaker for the *Annual Research and Development Meeting of BRENCO QBS* (one of the Amsted Rail Group of companies), held in Petersburg, VA, October 3-4, 2007.
12. C. Tarawneh. A Lumped Capacitance Model for the Transient Heating of Railroad Tapered Roller Bearings. *ASEE-GSW Regional conference*, March 28-30, 2007.
13. C. Tarawneh. Results of the Static and Dynamic Thermal Testing of Railroad Tapered Roller Bearings. Invited speaker for the *Annual Research Update Meeting between BRENCO QBS and the Union Pacific (UP)*, held in Petersburg, VA, July 19-20, 2007.
14. C. Tarawneh. Heat Transfer Modeling for Railroad Tapered Roller Bearings. Invited speaker for the *Annual Research and Development Meeting of BRENCO QBS* (one of the Amsted Rail Group of companies), held in Petersburg, VA, September 26, 2006.

Professional Honors and Awards

- Awarded the **Excellence Faculty Award in Research** for the College of Engineering and Computer Science for the year 2011.
- Awarded the **Dr. Hashim S. Mahdi Outstanding Faculty Award** for the year 2010-2011.
- Awarded the **Dean's Engineering Faculty Support Endowment Award** in 2010 for dedication to the students and the University's mission on becoming a premier learner-centered research institution.
- Awarded the **UT System Regents' Outstanding Teaching Award** in 2009.
- Awarded the **Dr. Hashim S. Mahdi Outstanding Faculty Award** for the year 2008-2009.
- Awarded the **Outstanding Faculty Award** for the year 2007-2008.
- Awarded the **Outstanding Faculty Award** for the year 2006-2007.
- Awarded the **Outstanding Faculty Mentor Award** for the year 2006-2007.
- Awarded the **Outstanding Faculty Award** for the year 2005-2006.
- Awarded the **Lockheed Martin Outstanding Faculty Award** for the year 2004-2005.
- Awarded the **Martin C. Hemsworth Scholarship** three consecutive years (2000-2002) for outstanding work as a teaching assistant.

Professional Service

- Member of the External Review Committee for the Department of Energy (DOE) for their Nuclear Energy University Program (NEUP).
- Member of the Editorial Board of an educational journal titled *Journal of Applications and Practices in Engineering Education*.
- Member of the External Review Committee for the *International Journal of Heat and Mass Transfer*.
- Member of the External Review Committee for the ASME Conference Publications.

Skills

- **Computer Skills**
  - FORTRAN, LATEX, MATLAB, MathCad, Maple, Labtech Notebook, GageScope, Engineering Equation Solver (EES), Microsoft Office Software, Axum, AutoCAD, and Xfig.
- **Language Skills**
  - Fluent in English, Greek and Arabic. Conversational and skilled in reading and writing French.

References

❖ Dr. Robert Freeman, Professor, Chair
The University of Texas-Pan American
Mechanical Engineering Department
ENGR 3.222A
1201 W. University Dr.
Edinburg, TX 78539-2999
(956) 665-2381
rafree@utpa.edu

❖ Dr. Stephen W. Crown, Professor
The University of Texas-Pan American
Mechanical Engineering Department
ENGR 3.234
1201 W. University Dr.
Edinburg, TX 78539-2999
(956) 665-5015
swcrown@utpa.edu

❖ Dr. Joseph A. Turner, Professor, Chair
University of Nebraska-Lincoln
Engineering Mechanics Department
W317.4 Nebraska Hall
Lincoln, NE 68588-0526
(402) 472-8856
jaturner@unl.edu

❖ Dr. John P. Barton, Professor
University of Nebraska-Lincoln
Mechanical Engineering Department
N113 WSEC
Lincoln, NE 68588-0656
(402) 472-5081
jbarton1@unl.edu