

**S. Perwez Kalim**

**Present Position** Professor and Director ABET activities, Wilkes University,  
Wilkes Barre, PA 18766

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**EDUCATION**

Ph.D. Mechanical Engineering, the University of Kansas, 1985  
M.S. Mechanical Engineering, the University of Kansas, 1982  
B.S. Accounting, Wilkes Univ., (24 credits completed)

**EXPERIENCE***EXPERTISE:*

**Finite Element Method, Bio & Microfluidics, Thermal Science, Aerodynamics, Energy Systems, and ABET Assessment**

*EXPERTISE RELATED EXPERIENCE:*

*CAD & Finite Element Systems ; ANSYS, FLUENT, SolidWorks, AutoCAD, Pro/ENGINEER*  
*Energy Systems Analysis ; FEDS, TRACE, DOE 2.1A, TRANSYS*  
*Quality Control; TQM, PROCESS QUALITY SIMULATOR*  
*Manufacturing Systems ; SIMFACTORY, SLP, CRAFT, CPM, SmartCAM*  
*ABET: ME Program Evaluator (past 10 Years) and Consultant*

**TEACHING EXPERIENCE 28 years**

<i>Professor</i>	Division of Engineering and Physics, Wilkes University-	2008
<i>Associate Professor</i>	Division of Engineering and Physics, Wilkes University-	1993
<i>Assistant Professor</i>	School of Science and Engineering (SSE), Wilkes University -	1988
<i>Assistant Professor</i>	School of Engineering & Technology, University of Arkansas at Little Rock Little Rock, AR.-	1985

*COURSES TAUGHT:*

ME 321 - Fluid Mechanics	ME 324 - Heat Transfer
ME 323 - Fluid Mechanics Lab	ME 326 - Heat Transfer Lab
ME 322 – Thermodynamics	ME 328 - Combustion Engines
ME 325 - Energy Systems	ME 340 - HVAC
ME 335 - Engineering Modeling & Analysis	ME 384 - Mechanical Design Lab
ME 211 - Introduction to Manufacturing	ME 231-234 - Statics & Dynamics I and II
ME 315 - Computer Integrated Manufacturing	ME 398- Combined Cycle Power Plant-HRSG
EGM 320 - Engineering Project Analysis	EGM 398 - Plant Layout & Mat. Handling
EGM 398 - Factory Simulation	EGM 398 - Tool Design

*GRADUATE COURSES OFFERED:*

Transport Phenomena – 2010, 2012  
Computational Method – 2011  
Gas Turbines – 2014  
Bio-Fluid Mechanics and Biofluidics – 2014

*FUTURE GRADUATE COURSES:*

Gas Dynamics  
Advanced Finite Element Analysis  
Advanced Conduction Heat Transfer  
Advanced Convection Heat Transfer

*LABORATORIES DEVELOPED:*

Heat Transfer Laboratory  
Fluid Mechanics Laboratory  
Combustion Engine Laboratory  
Computer Integrated Manufacturing Laboratory

**ADMINISTRATIVE EXPERIENCE**

*Director* ABET – Prepare Self Study Report for 2015 Visit,  
*Previously Prepared* Self Study Reports – Led two successful visits in 2003, 2009  
*Coordinator* Mechanical Engineering Program, Wilkes University- 2011 - 2013  
*Co-Chair* Department of Mechanical & Materials Engineering, Department of Engineering and Physics, 2000, 2001  
*Faculty Liaison* Dean of CASPS, Wilkes University, 2000-2002

**PROFESSIONAL EXPERIENCE**

2001-11 *Mechanical Engineering Program Evaluator*– ASME/ABET\*

\*Accreditation Board of Engineering Technology

1988-date Worked on various applied research projects. Most projects required close interactions with the industry. The projects involved research and technology transfer through funding granted by National Organizations such as, Armament Research Development and Engineering Center (ARDEC), Office of Surface Mining (OSM), Earth Conservancy (EC), Defense Advanced Research Projects Agency (DARPA), local industries, and North East Tier Ben Franklin Technology Center (NET/BFTC) etc. It included four years of research (1994-1997) in munitions de-commissioning system project sponsored by DARPA and four years of research (2009-2012) in Hybrid Projectile and UAV design sponsored by ARDEC. The munitions decommissioning system was commissioned in 1997 and projectile design research is ongoing.

1978-80 *Pipeline Construction Engineer, PARCO*: worked on pipeline construction activities including welding, coating, wrapping, and installation of cathodic protection systems. In this capacity, I became familiar with and exposed to functions and performance of rotating machines e.g. large booster pumps, gas turbines etc. Supervised repairs of pump station turbines and pumps.

1977-78 *Application Engineer, JE Limited*: Worked for air conditioning system designers and contractors and was responsible for the research, design, and installation of the Air Conditioning systems. It also included the energy savings surveys of the existing buildings.

1976-77 *Design Engineer, Machine Tool Corporation*: worked on machine tool design. Designed a Precision Boring Machine in collaboration with two design engineers. The group was involved

from conception to design, manufacturing and production. The machine was patented and marketed.

#### **MEMBERSHIPS**

- Member, American Society of Mechanical Engineers (ASME)
- Member, American Society of Engineering Education (ASEE)
- Member International Advisory Board, IBCAST 2010, 2011

#### **AWARDS**

- *Outstanding Teacher Award* (2008-2009)
- *Outstanding Teacher Award* (2000-2001)
- Nominated for Carpenter Teaching Award (1991-92)
- *Outstanding Teacher Award* (1991-92)
- *Outstanding Teacher Award* (1989-90)
- *Faculty Development Scholarship* (1990 and 1991) - ASEE/NSF
- *Faisal Foundation International Scholarship* (1983-85)
- *Ernest B. Lyder fellowship* (1984)

#### **SCHOLARLY ACTIVITIES**

##### **RESEARCH:**

***31 research proposals were developed during the period of 1988 to 2013 Total 18 proposals were funded***

##### **RESEARCH COMPLETED RECENTLY**

**2014** – *STEM GRANT PROPOSAL UNDER DEVELOPMENT, will be submitted in August 2014*

**2008 –2012, Phases 1,2, 3, and 4** - *collaboration with the Armament Research Development & Engineering Center (ARDEC) on “Wind Tunnel Testing and Analysis of next generation UAVs, and hybrid Projectiles” testing and analyzing the UAV for flying worthiness and flight range enhancement. **Total \$200,000***

**2007 - 2008** - *“Experimental Investigation of the Transient Forced Convection Heat Transfer,” This study seeks to develop a convection correlation that would be able to predict the phenomenon of the transient convection heat transfer. The research provided opportunities to; verify the validity of the Dittus-Boelter correlation to predict forced convection, determine the correlation for unsteady state forced convection heat transfer, evaluate the validity of the new correlation, and finally verify the dependence of the transient convection heat transfer coefficient on the fluid velocity, and time - **\$14,000***

**2006-07** – *“Study the effect of coolant temperature on the condensation heat transfer characteristics of HFC-134a flowing inside helicoidal pipes.” With Kuwait University team*

**2005** - "Fire Propagation in Abandoned Anthracite Mines," temperature and pressure data were collected on four mine fires and a correlation between fire movement with temperature and pressure was developed. The research was conducted with significant assistance from the Office of the Surface Mining, U.S. Department of the Interior, PA

**1994 to 1997** - "Recycling Operations With Waterjet (ROW)," Design an automated system that is capable of loading military munitions, removing energetic materials from them using water jet technology, and retrieving cleaned munitions. The deliverable was the manufacture of a portable Munitions Transport Module (MTM) and a Waterjet Ordnance and Munitions Blast Cleaner with Automated Tellurometry (WOMBAT). The system was designed and installed at Crane Naval Warfare Center, Indiana. The entire system is trailer-mountable and can be transported to selected army depots for munitions decommissioning - **\$748,386**

#### **OTHER RESEARCH PROJECTS COMPLETED PREVIOUSLY**

1. **Jun –Sep. 1994** - "Statistical Process Control" - \$30,000
2. **1992-94** - "Improvement of Manufacturing Operations," by EMCEE, White Haven, PA and North East Tier Ben Franklin Technology Center (NET/BFTC) Bethlehem, PA, - \$191,979
3. **1990-92** - "Robotic Welding Cell," Precision Tools Inc., Pittston, PA and Technology Transfer Program (TTP) West Pittston, PA, - \$137,25
4. **1990-91** - "Computer System Assessment," Mozip Signs and Printing Co., Kingston, PA and Technology Transfer Program (TTP) West Pittston, PA. - \$12,150
5. **1990** - "Beta Testing of Locally Manufactured Computer," TR Associates, Archbald, PA and Technology Transfer Program (TTP), West Pittston, PA. - \$23,200
6. **1989-91** - "Remote CAD/CAM System. Design," Mid-East Aluminum Co., Mountaintop, PA, and North East Tier Ben Franklin Technology Center Bethlehem (NET/BFTC), PA, - \$184,275

#### **PROPOSALS FUNDED BY FACULTY DEVELOPMENT COMMITTEE**

1. **2000 – 2010** -Several faculty development funds were awarded for paper presentations and conference participations.
2. **1998** - "Experimental Stress Analysis Techniques for the Teaching Laboratory," Raleigh, NC
3. **1991** -"Workshop on the Integrated Modeling and Simulation of Dynamic Systems,"-\$2000
4. **1990** - "Upgrade VS-2000 DEC Workstation's random Access Memory to 14 MB",- \$4000

#### **UNFUNDED PROPOSALS**

- "Solar/Wind-power Heating for Snow/Ice free Parking Lot/Sidewalks for Green Buildings" proposal submitted to ESTCP Resource Conservation, in response to Environmental Security Technology Certification Program (ESTCP), March 2012
- "Advanced Wind-Tunnel and Aerodynamic designing and Modeling and Simulation for Hybrid Projectiles W15QKN-08-R-0241," proposal was submitted to Munitions Metal Parts Manufacturing Technology in response to the Broad Agency Announcement (BAA) a – 2010

- "*Geo Spatial and Thermal Modeling of Abandoned Mine Fires*," proposal submitted to the NSF for FY-2006 funding, phase I - The proposed study was to predict how mine fires propagate and propose abatement methods. The proposal was developed in collaboration with the local environmental company (with William Toothill, and Emanuel T. Posluszny) December 8, 2005
- "*Tire Recycling With Waterjet (TROW)*," Submitted to Earth Conservancy (EC), Wilkes-Barre, PA and Defense Advanced Research Projects Agency (DARPA), NJ -March1996 - \$ 990,972
- "*Strain Tensor/Centerline Deviation*," Submitted to North East Tier Ben Franklin Technology Center (NET/BFTC) Bethlehem, PA, and Tensor technologies Inc. Hazelton, PA July 1995
- "*Design of a Meat/Poultry Rinse Unit*," Submitted to North East Tier Ben Franklin Tech. Center (NET/BFTC) Bethlehem, PA, and General Tank Inc. Berwick, PA July 1995 - \$145,141
- "*Universal Lift Frame for Chair*," submitted to North East Tier Ben Franklin Tech. Center (NET/BFTC) Bethlehem, PA, and American Dream International Inc. April 1993, \$106,296
- "*100% Granular Recycled Rubber Pellet Machinery*," submitted to North East Tier Ben Franklin Technology Center (NET/BFTC) Bethlehem, PA, July 1992-93 - \$135,500
- "*Ford Hybrid Electric Vehicle Challenge*," submitted to Ford Motor Company, - 1992
- "*CAE for Pole Manufacturing*," submitted to North East Tier Ben Franklin Technology Center (NET/BFTC) Bethlehem, PA. May 1990
- "*Automated Meat Processing Facility*," submitted to North East Tier Ben Franklin Technology Center (NET/BFTC) Bethlehem, PA. May 1990

#### **WORKSHOPS**

- Professional Grant Development Workshop, June 2011, Houston, TX
- Sustainable Energy Workshop- Solar Scholar, July 2010, Lehigh, PA
- Sustainable Energy Workshop- Wind Scholar, July 2009, Lafayette, PA
- "*NCIIA Workshop*," NCIIA 5th Annual National Conference, 2001, Washington, DC.
- "*ABET Evaluators Workshop*," Sponsored by ASME, Arlington, VA, 2001.
- "*EC 2000 Open Enrollment Engineering Faculty Workshop*," ABET, Atlanta GA, Oct 2000.
- "*Forum on the Lower Division Programs in Engineering Education (FLODEE)*." SUNY Binghamton, NY, Jun 2000.
- "*Integrated Modeling and Simulation of Dynamic Systems*" MIT, Cambridge, MA, June 1991.

#### **LECTURES AND SEMINARS**

- Key Note Speech – “Wind Energy” - IATS 6th International Advanced Technologies Symposium, Firat University, Elazığ, Turkey. 16th - 18th May 2011.
- “ABET Workshop I, II, and II- ABET Goals and Objectives,” College of Electrical and Mechanical Engineering, Rawalpindi, June 26 – July 29 2004.
- "Incorporating Finite Element Methods in the Heat Transfer Course and Across the Undergraduate ME Curriculum," University of Hartford, Hartford, Connecticut April 2000.
- "Implementation of ROW," Alfred University, Alfred, New York, June 1998.
- "WOMBAT System for Munitions Disarmament," Seminar, Earth Conservancy Board, Ashley,

Pennsylvania, December 1997.

- "Incorporation of Waterjet Technology in the Human Related Applications," Lecture, National University of Singapore, Singapore, January 1995.
- "Recycling with Waterjet," Invited presentation at the US. Army Armament Munitions Chemical Command, Rock Island, Illinois, Oct. 1994.
- "Demilitarization Symposium," Organized by American Defense Preparedness Association, Washington, DC, May 1994.
- "Engineering in Training (EIT)" 1989-97, 99, 2001, 2002, 2004-06, 2009, 2012
- "PE (Mechanical) Review Sessions,"
- "Need for and design of an Undergraduate Robotics Curriculum," 1990 ASEE Automation and Robotics Workshop, RPI, June 1990.

## PUBLICATIONS

### BOOK AND MANUALS

- "Fundamentals of the Finite Element Method *with Engineering Applications*." Book Publication Proposal to be submitted to Taylor and Francis/CRC Press, 2015.
- "Fundamentals of Engineering Exam" -Study Guide, Review Sessions, 2014 - Compiled
- "Heat Transfer - Laboratory Manual." Wilkes University, Revised -2011
- "Fluid Mechanics - Laboratory Manual." Wilkes University, Revised -2011
- "Introduction to Manufacturing- Laboratory Manual." Wilkes University, Revised 2000

### PAPERS

- During four years (2008-12) of research on UAV and Hybrid Projectiles, various designs were created. They could not be published for public information because of government-university confidentiality and non-disclosure agreements.
1. "Impedance characteristics of human arm for robot-assisted patient lifting," (with Justin L. Flam, Xiaoli Zhang, Songpo Li, Jiucui Zhang, and Rodney Ridley) proceedings of the ASME 2013 International Design Engineering Technical Conferences & Computers and Information in Engineering Conference - IDETC/CIE 2013, August 2013, Portland, OR.
  2. "Effect of Coolant Temperature on the Condensation Heat Transfer Characteristics of HFC-134a Flowing Inside Helicoidal Pipes" (with M. H. Alhajeri et.al.), Experimental Heat Transfer, Taylor & Francis, ISSN 0891-6152, OCLC -41394115, Jan 2009, <http://www.researchgate.net/publication/233243762>
  3. "Heat Transfer Performance during Condensation of R-134a," paper # AC 2008-91, ASEE Conference and Expo, Pittsburgh, June 2008
  4. "Improving Retention by Implementing Outcome based Design Experience in a Sophomore Course," paper # AC 2007-558, published and presented at the ASEE Conference and Expo. Hawaii, June 2007
  5. "Design of A Pump Setup for Fluid Mechanics Laboratory," paper # 2006-264, published and presented at the ASEE Conference and Expo. Chicago 18-21 June 2006

6. "*Fire Propagation in Abandoned Anthracite Mines*," (with William Toothill, and Emanuel T. Posluszny) Proceedings of the 27th Annual Conference of the National Association of Abandoned Mine Land Programs (NAAML), Bristol, VA, September 18 - 21, 2005
7. "*Accuracy Study of the Axisymmetric Shell Elements for Heat Conduction*," Indian Society of Heat and Mass Transfer, pp. 863-868, January 2000, Pune, India.,
8. "*Design and Manufacture of a Passive Munitions Carrier*," presented at the Second World Manufacturing Congress, International Symposium on Manufacturing Technology, Durham, U.K. (See Proceedings, pp. 432-438), Sep 27-30, 1999
9. "*Automated Manufacturing System Design Using Petri Nets*," presented at the 1996 Pacific Conference on Manufacturing (PCM) Seoul, Korea, Oct. 29-31, 1996
10. "*A Transportable Waterjet Reclamation System for Explosive Loaded Munitions*," (with Fossey, Summers, Stein, Dziak, Renfer, and Sims), presented at the Global Demilitarization Symposium, Reno, Nevada, May 15, 1996
11. "*Measurements of Thermal Conductivity of Solids Using Thrifty Design Setup*," (with Gregory Antonini-ME Student) ASEE Conference, September 1995
12. "*Integration of Laboratory Instruction into the Mechanical Engineering Curriculum*," (with C. Mirman), see proceedings of the World Conference on Engineering Education in Minneapolis, MN, October 1995
13. "*Measurements of Thermal Conductivity of Solids Using Thrifty Design Setup*," (with Gregory Antonini-ME Student) See proceedings of the Frontiers in Education Conference, Anaheim, CA November 1995
14. "*The Development of a Portable WOMBAT Facility*," (with R.D. Fossey, D.A. Summers, & U. Nejib), proceedings of the 8th American Waterjet Conference, pp 603-607, Houston, Texas, August 1995
15. "*A Portable WOMBAT Facility, (first generation)*" (with R.D. Fossey, D.A. Summers, & U. Nejib), presented at the 1995 Demilitarization Symposium & Exhibition, St. Louis, MO, May 1995
16. "*Automated System for Munitions Decommissioning using Waterjet Technology*," presented at the Pacific Conference on Manufacturing (PCM), Jakarta, Indonesia, (Proceedings, pp. 265-272). December 1994
17. "*Modeling Flexible Manufacturing System using Simulation Technique*", Proceedings of The International Society of Computer Simulation, Vol. 23, April 1991
18. "*An Engineering Simulation of the Growth and Healing of Bone Fractures*", Proceedings of the International Society of Computer Simulation, Vol. 22, PP. 196-201, April 1990
19. "*A Novel Approach to Model Turbulent Flow Heat Transfer*", Proceedings of the International Society of Computer Simulation, Vol. 22, PP. 311-315, April 1990
20. "*Line and Transition Finite Elements for Heat Conduction*", World Congress on Computational Mechanics, University of Texas, Austin, September 22-26, 1986
21. "*Isoparametric Heat Conduction Shell Elements*", (with K.S. Surana), Journal of Computers and Structures, Vol. 26, No. 8, pp. 1197-1199, 1988
22. "*Sensitivity Study of Isoparametric Axisymmetric Shell Elements*", proceedings, The International Society of Computer Simulation, Vol. 19, PP. 111-113, April 1988
23. "*New Concepts in Heat Conduction Modeling*", proceedings, The International Society of Computer

Simulation, Vol. 18, PP. 144 -149, April 1987

24. "Isoparametric Transition Finite Elements with Temperature Gradients for Axisymmetric heat conduction," (with K.S. Surana), ASME Eighth International Heat Transfer Conference, Journal of Heat Transfer, San Francisco, CA., Paper NU-04, August 86
25. "Isoparametric Line and Transition Finite Elements with Temperature and Temperature Gradients as Primary Variables for Two-dimensional Heat Conduction," (with K.S. Surana), Journal of Computers and Structures, Vol. 24 No. 6, pp. 963-976, 1986
26. "Isoparametric Axisymmetric Transition Finite Element with Temperature Gradients for Heat Conduction," (with K.S. Surana), Journal of Computers and Structures, Vol. 24 No. pp. 197-212, 1986
27. "Isoparametric Axisymmetric Shell Elements with Temperature Gradients for Heat Conduction," (with K.S. Surana), Journal of Computers and Structures, Vol. 23 No. 2, pp. 279-289, 1986
28. "Finite Element Formulation for Heat Conduction in Axisymmetric Shells with Temperature Gradients," (with K.S. Surana), ASME Winter Annual Meeting, Journal of Heat Transfer, ASME-85-WA/HT-65, November 1985
29. "An Experimental and Analytical Investigation of Phase Change Thermal Energy Storage Unit," (with B.Yimer and J.N. Crisp), Journal of Heat Transfer, ASME 82-WA/HT-48, November 1982

#### **MS THESIS**

1. Computational Fluid Dynamic Analysis of a Vertical Centrifugal Slurry Pump- Brian Long - 2014
2. The Reproduction of an Impeller-Francis Vane using BladeGen for Slurry Applications - Michael Mill -2014
3. Collection of NPSH data with Data Acquisition hardware and LabView – Michael Rodriguez- 2014
4. Hydraulic Motor-Driven Bearing Lubrication System For A Centrifugal Pump, Gary Saylor-2014
5. Shaft Design for Single Stage Horizontal Slurry Pump - Gurvinder Singh- 2013
6. Others will be furnished upon request.

#### **PROFESSIONAL ACTIVITIES**

- April 2014 – 2014 ABET Symposium, Pittsburgh, PA
- Engineering Accreditation Consultant –. Help develop process and procedures to establish programs vision, goals, objectives, outcomes and overall evaluation process according to the Accreditation Board of Engineering and Technology (ABET) process of engineering program accreditation in USA - 2009-11
- 14th International Heat Transfer Conference, August 8-13, 2010 Washington D.C.
- ASEE Conference, Chicago, June 18 - 21, 2006
- Team Leader, Responsible for preparing ABET Self Study Report for both Mechanical and Electrical Engineering Programs, Wilkes University – 2002-03, 2008-09
- 2005 – 07 - Consultant, POZ Environmental Inc., Pittston, PA
- *Mechanical Engineering Program Evaluator* (2001-2008) ASME/ABET
- ME Program Evaluation reports to ASEE & ASME – 2001 to 2008
- Session Chair, ASME/ISHMT Conference, Pune, India, January 2000



- Session Chair, Winter Manufacturing Conference, Durham, UK, 1999
- Session Chair, Pacific Conference on Manufacturing, Jakarta, 1994
- Chair, Conference Track, Computer Multi-conference, Houston, TX, 1991
- Chair, Conference Group, Simulators Multi-conference, New Orleans, LA, 1990
- Reviewer, Technical Papers, Society of Computer Simulation, 1990, 1991
- Session Chair, Mathematical Modeling Session, Simulators Conference, 1987 to 1991

#### **REPORTS**

- Wilkes Mechanical and Electrical Engineering Program Self ABET Study Report – May 2009
- ME Program Evaluation Report to ASME – 2002 to 2008
- ME Program Report- Future Directions and Tools for Growth -Submitted to David Wells- Director Division of Engineering Wilkes University - 2005
- Wilkes Mechanical Engineering Program Self ABET Study Report –2003
- Numerous quarterly reports during the conductance and final reports at the conclusion of all research projects completed from 1988 – 2012

#### **REFERENCES**

- *Dr. Mamoun Bader, Vice Provost for Academic Affairs and Professor of Chemistry at Alfaisal University, [mbader@alfaisal.edu](mailto:mbader@alfaisal.edu), 966 11 2157620*
- *Dr. Munawer Ahmed, Electrical Engineer, Dallas, TX 501-733-7495*
- *Mr. Aijaz Fakhruddin, [aijazf@hotmail.com](mailto:aijazf@hotmail.com), IT Specialist, Mountain Top, PA 570-417-9073*
- *Mr. Kurt Topfer, Coordinator ABET activities, Wilkes University, 570-408-4810*