

# Alaa Eldeen A. Hassan Ali, Ph.D., P.E.

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## Education

- **University of Wisconsin-Madison, Madison, WI**
  - Ph.D. Mechanical Engineering 2000
  - M.Sc. Mechanical Engineering 1998
- **Alexandria University, Alexandria, EGYPT**
  - M.Sc. Mechanical Engineering 1992
  - B.Sc. Mechanical Engineering 1985

## Professional Appointments & Affiliation

- **University at Buffalo, Buffalo, NY**
  - *Teaching Assistant Professor* 2016-Present
- **University of Texas at San Antonio, San Antonio, TX**
  - *Senior Lecturer* 2015-2016
- **McMaster University, Hamilton, ON, CANADA**
  - *Co-Director of the Thermal Processing Laboratory* 2006-2014
  - *Research Associate* 2009-2014
  - *Postdoctoral Fellow* 2006-2009
  - *Sessional Lecturer* 2007-2014 (part-time)
- **Mohawk College, Hamilton, ON, CANADA**
  - *Sessional Lecturer* 2012-2013 (part-time)
- **Alexandria University, Alexandria, EGYPT**
  - *Assistant Professor* 2000-2006
  - *Teaching Assistant* 1987-1995
- **Arab Academy for Science and Technology, Alexandria, EGYPT**
  - *Adjunct Professor* 2003-2004 (part-time)
- **Alexandria Higher Institute of Engineering and Technology, EGYPT**
  - *Adjunct Professor* 2004-2005 (part-time)
- **Professional Engineers Ontario, ON, CANADA**
  - *Fully Licensed Professional Engineer* 2011-Present

## Academic Experience

### ○ Teaching

#### – University at Buffalo, Buffalo, NY

Course Code	Course Title	Enrollment	Department	Evaluation
		≈		
EAS 230	Engineering Computation	1000	EAS	4.5/5
MAE 494	Design Project	40	MAE	4.5/5
MAE 204	Thermodynamics	60	MAE	N/A

#### – University of Texas at San Antonio, San Antonio, TX

Course Code	Course Title	Enrollment	Department	Evaluation
		≈		
ME 3293	Thermodynamics I	150	ME	4.2/5
ME 4293	Thermodynamics II	90	ME	4.4/5
ME 3663	Fluid Mechanics	50	ME	4.3/5
EGR 2323	Engineering Analysis I	100	EGR	4.1/5

#### – McMaster University & Mohawk College, Hamilton, ON, CANADA

Course Code	Course Title	Enrollment	Department
		≈	
ME 2W04	Thermodynamics	120	ME
EP 2NE3	Thermal Systems Design	50	EP
ENG 3K03	Intro. to Thermo. and Heat Transfer	50	ENG
CHE 2O04	Fluid Mechanics	120	CHE
ME 3FO4	Numerical Solutions and Modeling	120	ME
ME 753	Adv. Fluid Mechanics	20	ME
ME 3O04	Fluid Mechanics	120	ME
AUTO TECH 3TS3	Fluid Mechanics	50	AUTO TECH
ENR TECH 4TR3	Renewable Power Technologies II	50	ENG TECH

#### – Alexandria University, Alexandria, EGYPT

Course Code	Course Title	Enrollment	Department
		≈	
ME 221	Engineering Thermodynamics	350	ME
ME 321	Engineering Thermodynamics II	350	ME
ME 121	Measurements and Instrumentation	350	ME
ME 331	Heat Transfer	350	ME
ME 421	Power Stations Technology	300	ME
ME 422	Refrigeration and Air Conditioning	300	ME
ME 631	Convective Heat and Mass Transfer	30	ME
ME 632	Convective Boiling and Condensation	30	ME

### ○ Others

- Supervised many undergraduate senior engineering students for their final term

project;

- Supervised many graduate (Master and Ph.D.) students for their research projects;
- Assisted in the establishment of the first Thermal Processing Laboratory at McMaster University, Hamilton, Ontario, Canada.
- Assisted in the establishment of the first desalination laboratory at Alexandria University, Alexandria, Egypt;
- Assisted in the establishment of Alexandria Desalination Academy (ADA - [www.ada-eg.com](http://www.ada-eg.com)) the first e-learning institute in desalination and water purification in both English & Arabic;
- Designed the Thermal Engineering Laboratory of Pharos University, Alexandria, Egypt, 2005.

## Engineering Experience

- **Energy Efficiency and Auditing: UNION GAS LTD., "EnerSmart for Business for Energy Saving"** Supervised a team of 7 Co-op mechanical/civil engineers for energy monitoring and auditing of 150+ school and industrial buildings in Greater Hamilton Area. 45% annual saving (About \$2.25 million) in both electrical and thermal energy was achieved.
- **2D/3D Steady/Transient ANSYS-CFX Simulations and Analysis:** Including 3D geometry building, model set-up and processing, results post-processing and analysis, detailed technical report writing and power point presentations.
- **Modeling/Software Development:** Including finite difference two-phase flow and heat transfer model development, FORTRAN programming, software validation and technical support upon request.
- **Experimental Design, Data Measuring, Recording and Processing:** Designed and built experimental rigs, performed measurements and data processing under laboratory and real life conditions for numerical models validation.
- **Energy Audits and Efficiency of Industrial and Institutional Buildings:** with applications to the possible measures of energy saving and recovery in schools and industry.

## Related Experience and Skills

- Strong ability to interact with students of different learning abilities and to develop their understanding with admiration (Outstanding Evaluation was obtained in most of the courses taught, see attachments);
- Strong and effective teaching skills using a variety of visual aids (PowerPoint slides, videos and chalkboards);
- Committed to excellence in teaching using active learning methods such as hands-

on experience, problem-based and project-based learning, think-pair-share method, group discussion, etc.;

- Ability to demonstrate the relevance between course materials and real life applications using many examples in lectures, tutorials and/or laboratories;
- Expert in using Microsoft Office (Word, Excel and PowerPoint);
- Expert in programming with MATLAB-2017 and FORTRAN 90-95.
- Expert in CFD/Thermal software packages such as ANSYS-CFX, FLUENT.
- Expert in educational software packages such as EES, IT-3.2, FEAT.
- Energy Efficiency Software packages such as RETScreen, EFAST, EPlus, EQuest.
- Adaptive to working independently and as a member of a team.

## Professional Affiliation

- Professional Engineers Ontario, ON, CANADA 2011-Present
- The Egyptian Syndicate for Engineers 1985-Present
- The Egyptian Society of Water and Energy 2005-Present
- The American Society of Heating, Refrigeration and Air Conditioning Engineering (ASHRAE) 1997 - 2000
- The American Society of Mechanical Engineering (ASME). 1998 - 2000

## Honors and Awards

### Alexandria University, Alexandria, EGYPT

- Outstanding Educational Award. 1980-1985
- Degree of Honor. 1985
- Mech. Eng. Award for the Highest Rank in Thermal Engineering. 1985

## Professional Development

### University of Texas at San Antonio, San Antonio, TX

- Institutional Standards of Conduct Training: *This online training is mainly for faculty addresses federal and state laws, particularly those that are relevant to the higher education environment. The training covers sexual harassment, Title IX and Campus SaVE and informs university employees about crime prevention and their mandatory reporting responsibilities.* [www.utsa.edu/compliance/](http://www.utsa.edu/compliance/).
- Risk Management Training: *This training is mainly for faculty and staff advisors of UTSA student organizations and includes seven risk management topics including sexual assault prevention and Title IX. The training is delivered by the UTSA Office of Student Activities.* [www.utsa.edu/sa/](http://www.utsa.edu/sa/).

## Research Interests

- **Multi-Phase Flow and Heat Transfer:** With application to nuclear reactor safety and waste disposal.
- **Thermal Processing of Metals:** With application to the heat treatment of automotive parts in batch and continuous industrial furnaces that use both atmospheric and vacuum technology.
- **Effective Thermal Conductivity of Packed Load of Metal Parts:** With application to the continuous load of small metal parts of the automotive industry on the conveyor belt of the continuous atmospheric furnaces.
- **Boiling of Nano-fluids:** With application to two-phase heat exchangers.
- **Desalination using Reverse Osmosis Membrane Technology:** With application to solar energy self-stand desalination units and active learning.

## Publications

- **Hassan, A. A.** and Hamed, M. S., "Modeling Effective Thermal Conductivity of Randomly Distributed Loads of Mono-Sized Parts of Arbitrary Geometry," *Materials Performance and Characterization*, Vol. 5, No. 1, 2016, pp. 7-22, <http://dx.doi.org/10.1520/MPC20150031>. ISSN 2165-3992.
- **Hassan, A. A.**, Baraich, H. S., Hamed M. S., and Abdel-Hady, A., "Effect of Surface Condition on Pool Boiling of Nanofluids on Horizontal Flat Surfaces," *presented at the 8th International Conference on Boiling and Condensation Heat Transfer, June 3-7, 2012, Lausanne, Switzerland.*
- **Hassan, A. A.**, and Hamed M. S., "Model-Based Optimization of the Heat Treatment of Randomly Packed Load in Mesh Belt Multi-Zone Continuous Furnaces," *Materials Science Forum Vols. 706-709 (2012) pp 289-294. Presented at THERMEC'2011 the 7th International Conference on Processing and Manufacturing of Advanced Materials, Québec, Canada.*
- **Hassan, A. A.**, and Hamed M. S., "Towards the Achievement of 2020 Vision Goals of the Heat Treating Industry," *JOM Journal of the Minerals, Metals and Materials Society*, 62-9 (2010) 55-59.
- Takrouri, K., Luxat, J., **Hassan, A. A.**, and Hamed, M. S., "Heat Transfer and Two-Phase Flow Behavior during Quench of Hot Horizontal Cylindrical Tubes", *Proceedings of the Fourth International Conference on Thermal Engineering Theory and Applications, Abu Dhabi, UAE, January 12-14, 2009.*
- **Hassan, A. A.**, and Hamed M. S., "Optimization of Energy Utilization and Productivity of Heat Treating Batch-Type Furnaces," *Journal of ASTM International*, Vol. 5, No. 1, 2008.

- Fath, H. E. S., Elsherbiny, S. M., **Hassan, A. A.**, Rommel, M., Wieghaus, M., Koschikowski, J., and Vatansever, M., "PV and Thermally Driven Small-Scale, Stand-Alone Solar Desalination System with very Low Maintenance Needs," *Desalination* 225 (2008) 58-69.
- **Hassan, A. A.**, Curtis, C. P., Hamed M. S. and Shoukri M., "How To Load A Patch Furnace," *2007 TMS Annual Meeting & Exhibition, Orlando, Fl, USA, February 25<sup>th</sup>-March 1<sup>st</sup>, 2007.*
- Elhelw, M. G., Saeed, M. B., **Hassan, A. A.**, El-Sayed, A. A., "An Improved Performance of Direct Expansion Coils Using a Heat Pipe," *ASHRAE 10<sup>th</sup> International Exhibition and Seminars, June 2004, Cairo, Egypt.*
- Zeitoun, O. and **Hassan, A. A.** "Turbulent Forced Convection in Partially Heated Tubes," *Mansoura Fourth International Engineering Conference, April 2004, Sharm El-Sheikh, Egypt.*
- **Hassan, A. A.** and Corradini, M. L., "Simulation and Modeling of Heat Transfer between a Volumetrically Heated Pool and a Decomposing Substrate," *Proceedings of the ICMF-2001 (4<sup>th</sup> International Conference on Multiphase Flow), New Orleans, LA, USA, May 2001.*
- **Hassan, A. A.**, "An Introduction to Thermodynamics," 2<sup>nd</sup> Edition, Dar El-Hoda for Publishing and Printing, Alexandria, Egypt, 2003.
- **Hassan, A. A.**, "Theory of Steam and Gas Turbines," Dar El-Hoda for Publishing and Printing, Alexandria, Egypt, 2005.