

# Curriculum Vitae

## Personal

Name: Osama M. Abuzeid  
Date of Birth: March, 28<sup>th</sup>, 1961  
Nationality: Jordanian  
Marital Status: Married with three children.  
Address: Mechanical Engineering Department,  
University of Jordan,  
Amman-11942-Jordan,  
E-mail: [oabuzeid@ju.edu.jo](mailto:oabuzeid@ju.edu.jo)



Home page: <http://eacademic.ju.edu.jo/oabuzeid/default.aspx>

## Academic Rank, Activities

Professor Doctor. 14/05/2012

Chairman Mechanical Engineering Dept.: Academic year 2012/2013

## Education

1979: General Secondary Certificate, Altaj-Secondary School, Amman-Jordan.

1984: B.Sc. Degree in Mechanical Engineering, University of Jordan, Amman-Jordan.

1997: Ph.D. Degree in Mechanical Engineering, Politecnico di Torino, Italy.

Academic Deg. Ph.D, Politecnico di Torino, 1997, Italy.

Exact Specialization: Contact Mechanics, Tribology.

Research Interest: Materials behavior under contact, contact conductance, contact resistance, tensile structure, energy Economics.

## Teaching courses:

### **1) Undergraduate Courses (B.Sc.)**

Engineering Drawing and Descriptive Geometry, AutoCAD, Statics, Dynamics, Theory of Machines, Vibration, Strength of Materials, Machine Design, Numerical Methods for Engineers, Engineering Economy, Failure and Fracture Analysis, Matlab.

### **2) Graduate Courses (M.Sc. and Ph.D.)**

Advanced Solid Mechanics, Continuum Mechanics, Fracture mechanics, Finite Element Method (Applications using ANSYS), Energy Economics.

## **Publications**

(29) Osama Abuzeid, Amjad Daoud, and Mahmoud Barghash (2019). ***Optimal Off-Grid Hybrid Renewable Energy System for Residential Applications Using Particle Swarm Optimization***. Jordan Journal of Mechanical and Industrial Engineering. V13: (2), pp. 117 – 124.

(28) Farah Dawoud, Ahmed Al-Salaymeh and Osama Abuzeid, (2019). ***(Electricity Generation Scenarios for Jordan 2018-2035)***. *International Journal of Recent Scientific Research*, Vol. 10, Issue, 02(F), pp. 31086-31100.  
DOI: <http://dx.doi.org/10.24327/ijrsr.2019.1002.3190>

(27) Bsisu, K.A. and Abuzeid, O.M., (2016). ***Finite Element Analysis of a Glass Facades Supported by Pre-Tensioned Cable Trusses***. International Journal of Civil and Environmental Engineering, 10(8),1420.

(26) O.M. Abuzeid and N. Alnuman, (2013). ***Thermal Contact Conductance of Elastically Deforming Nominally Flat Surfaces Using Fractal Geometry***. Industrial Lubrication and Tribology, Vol. 65(6), pp. 390 – 398.

(25) Osama M. Abuzeid, (2012). ***Thermal creep model of rough fractal surfaces in contact: viscoelastic standard linear solid***. Industrial Lubrication and Tribology, Vol. 64(4), pp. 208 - 216

(24) A.N. Al-Rabadi, M.A. Barghash and O.M. Abuzeid, (2011). ***Intelligent Regulation Using Genetic Algorithm - Based Tuning for the Fuzzy Control of the Switching-Mode Buck Converter***. IAENG International Journal of Computer Science, 38:4, IJCS\_38\_4\_02.

(23) Osama M. Abuzeid, Hashem S. Alkhaldi, and Peter Eberhard, (2011). ***A Thermal Creep Model for the Contact of Nominally Flat Surfaces: Jeffreys' Linear Visco-elastic Model***. International Journal of Mechanical Sciences 53(10), 910–917.

(22) Barghash, M.A., Abuzeid, O.M., Al-Rabadi, A.N. and Jaradat, A. (2011). ***Petri Nets and Ladder Logic for Fully-Automating and Programmable Logic Control of Semi-Automatic Machines and Systems***. American J. of Engineering and Applied Sciences 4 (2): 252-264.

(21) Osama M. Abuzeid, Anas N. Al-Rabadi, and Hashem S. Alkhaldi, (2011). ***Recent Advancements in Fractal Geometric-Based Nonlinear Time Series Solutions to the Micro-Quasistatic Thermoviscoelastic Creep for Rough Surfaces in Contact***. *Mathematical Problems in Engineering*, vol. 2011, Article ID 691270, 29 pages, 2011. doi:10.1155/2011/691270.

- (20) Osama M. Abuzeid, Anas N. Al-Rabadi, and Hashem S. Alkhalidi, (2010). **Fractal Geometry-Based Hypergeometric Time Series Solution to the Hereditary Thermal Creep Model for the Contact of Rough Surfaces Using the Kelvin-Voigt Medium**. *Mathematical Problems in Engineering*, vol. 2010, Article ID 652306, 22 pages, 2010. doi:10.1155/2010/652306.
- (19) Naser Al-Huniti, Fadi Al-Faqs and Osama Abu Zaid, (2010). **Finite Element Dynamic Analysis of Laminated Viscoelastic Structures**. *Applied Composite Materials*, 17(4):405–414.
- (18) Al-Huniti, N., Al-Faqs, F. and Abuzeid, O. (2009). **Finite Element Dynamic Analysis of Laminated Viscoelastic Structures**. 7th International Conference on Composite Science and Technology (ICCST/7), January 20-22, 2009, American University of Sharjah, UAE.
- (17) Osama M. Abuzeid and Taher A. Alabed (2009). **Mathematical modeling of the thermal relaxation of nominally flat surfaces in contact using fractal geometry: Maxwell type medium**. *Tribology International*, 42(2), pp. 206-212.
- (16) Abdul Salam Y. Alsabbagh, Osama M. Abuzeid, and Mohammad Dado (2009). **Simplified stress correction factor to study the dynamic behavior of a cracked beam**. *Journal of Applied Mathematical Modeling*, 33(1): 127-139.
- (15) Alabed, T.A., Abuzeid, O. M., Mahmoud Barghash (2008). **A linear viscoelastic relaxation-contact model of a flat fractal surface: Maxwell type medium**. *International Journal of Advanced Manufacturing Technology*, 39(5-6): 423-430.
- (14) Duwairi, H. M., Abuzeid, O. And Damseh, R.A. (2007). **Viscous And Joule Heating Effects Over An Isothermal Cone In Saturated Porous Media**, *Jordan Journal of Mechanical and Industrial Engineering JJMIE*, Vol. 1(2), pp. 113-118.
- (13) Osama M. Abuzeid, and Taher A. Alabed (2007). **A Simplified Model to Study the Thermal Contact Relaxation of A Fractal Surface**. *The 6<sup>th</sup> Jordanian International Mechanical Engineering Conference (Jimec'6)*, 22 - 24 October 2007, Amman – Jordan
- (12) Abuzeid, O., M. and Eberhard, P. (2007). **Linear viscoelastic creep model for the contact of nominal flat surfaces based on fractal geometry: standard linear solid (SLS) material**. *ASME Journal of Tribology*, Vol. 129(3), pp. 461-466.
- (11) Hamdan, M.N., Abuzeid, O. and Al-Salaymeh, A. (2007). **Assessment of an edge type settlement of above ground liquid storage tanks using a simple beam model**. *Journal of Applied Mathematical Modelling*, Vol 31(11), pp. 2461–2474

- (10) Abuzeid, O. (2006). **A viscoelastic creep model for the contact of rough fractal surfaces: Jeffreys' type material**. Proc. 7<sup>th</sup> Inter. Conf. Production Engineering and Design for Development, Cairo, Egypt. pp. 636-646
- (9) Hamdan, M.N., Abuzeid, O. and Al-Salaymeh, A. (2004). **Beam model for analysis of edge type settlement of unanchored liquid storage tanks**. 5<sup>th</sup> Jordanian International Mechanical Engineering Conference, JIMEC 2004
- (8) Abuzeid, O. and Dado, M.H.F. (2004). **Fractal model to predict the crack roughness effect on the local bending compliance of circular shafts**. Int. J. Mechanical Sciences, vol. 46(5), pp. 695-702.
- (7) Dado, M., Al-sadedr, S. and Abuzeid, O. (2004). **Post-buckling behavior of a compliant column with intermediate local bending flexibility**. Int. J. non-linear Mechanics, vol.39(10), pp. 1579-1587.
- (6) Abuzeid, O. (2004). **A linear viscoelastic creep-contact model of a flat fractal surface: Kelvin-Voigt medium**. Journal of Industrial lubrication and tribology, vol.56(6), pp. 334-340.
- (5) Abuzeid, O.(2003). **A linear thermo-visco-elastic creep model for the contact of nominal flat surfaces based on Fractal Geometry: Kelvin-Voigt medium**. Journal Of Quality In Maintenance Engineering, vol. 9/2, pp 202-216.
- (4) Abuzeid, O.(2003). **Linear viscoelastic creep model for the contact of nominal flat surfaces based on fractal geometry: Maxwell type medium**. Dirasat, vol. 30(1), pp. 22-36.
- (3) Dado, M.H.F. and Abuzeid, O. (2003). **Coupled transverse and axial vibratory behavior of cracked beam with end mass and rotary inertia**. J. Sound and Vibration, vol. 261/4 pp 675 – 696.
- (2) Abuzeid, O. (2002). **Fractal model of a linear thermoelastic contact between flat rough surfaces based on cantor structure**. Proc. 6<sup>th</sup> Inter. Conf. Production Engineering and Design for Development, Cairo, Egypt, pp. 887-903.
- (1) O.O.Badran, O.M. Abuzeid, H.A.AL-Shoubaki , T.Al-Haddid, and M.Al-Rimawi, (2001). **Effect of shot peening on chloride stress corrosion cracking resistance of 304 stainless steel**. Proc. 1<sup>st</sup> Int. Industrial Engineering Conf., Amman, Jordan.

## **Languages**

Arabic: Native Language

English: Very Good

Italian: Good

## **Work Experiences**

1984-1990: Maintenance Engineer, Royal Maintenance Corps and Jordan Telecom, Amman-Jordan.

1991-1992: Teaching Assistant, Dept. Mechanical Engineering, University of Jordan.

1998-2004: Assistant Professor, Dept. Mechanical Engineering, University of Jordan.

2004-2012: Associate Professor, Dept. Mechanical Engineering, University of Jordan.

2012-2014: Professor Doctor, Dept. Mechanical Engineering, University of Jordan.

2004-2005: Sabbatical leave, Philadelphia University, Jerash-Jordan

2015-2016: Visiting Professor Doctor, Dept. Mechanical Engineering, University of Tabuk, Kingdom of Saudi Arabia (KSA).

2014-Now: Experience of ABET Accreditation

- ABET accreditation preparations undertaken by the Department of Mechanical Engineering-The University of Jordan. The Department is ABET accredited.
- ABET accreditation preparations (in process) undertaken by the Department of Mechanical Engineering-The University of Tabuk. The Department is about to apply for ABET accreditation.

## **Research Grants:**

- June-August 2004 DFG grant for summer research visit in Germany. Host Professor, Prof. Dr.-Ing. Peter Eberhard, and his team are working in the field of "Contact molecular dynamics". My visit was not concentrate only on the establishing of a joint research work in the field of "Contact molecular dynamics" but also to benefit from the ideas and suggestions of the research team of Institute of Engineering and Computational Mechanics, University of Stuttgart.
- June-August 2006 DFG grant for summer research visit in Germany. Host Professor: Prof. Dr.-Ing. Werner Sobek, Institute for Lightweight Structures and Conceptual Design (ILEK), University of Stuttgart. My visit aims at establishing a joint research in the field of "Light Weight Structures" and to benefit from the ideas and suggestions of the research team of ILEK.

Furthermore I intended to study the new applications of tempered glass in structural parts of buildings (i.e., posts, beams, and shear walls), and its load-carrying capacity.

- June-August 2007 DFG grant for summer research visit in Germany. Host Professor: Prof. Dr.-Ing. Werner Sobek. Finite Element Analysis of Glass/Polyvinyl Butyral Laminates Subjected to Uniform Pressure (Using ANSYS). We apply a model for stress analysis of such laminates that consists of a three-dimensional finite-element model (using ANSYS) incorporating polymer viscoelasticity and large deformations. The results produced by ANSYS shows a good agreement with an analytical and experimental results conducted by different authors.
- June-August 2008 DFG grant for summer research visit in Germany. Host Professor: Prof. Dr.-Ing. Richard Stroetmann, institute of Steel and Timber Construction of Technische Universität Dresden. The research was established to study the "Stability of Hybrid-constructions out of Steel and fabric Membranes". An appropriate description of the load bearing behaviour of the hybrid-construction is only possible, if the co-action of membrane and primary construction is taken into account. Therefore the special material properties of steel and fabric membrane and the non-linear load-bearing behaviour need to be represented in a finite-element-model (ANSYS).

### **Faculty For Factory National Project Participation**

- 2003: Jordan Shareef Plastic Factory, Dancing Roll Design and Manufacturing, 3 months, July-September. A device for controlling the tension in a material web of a flexographic printing machine is proposed. It includes an adjustably positionable dancer roll coupled to air cylinder. It engages the web at position subsequent to the dryer exit nip rolls and prior to the next nip roll pair. The air cylinder applies a constant force to the dancer roll to maintain contact between the dancer roll and the web. In this manner, the tension in the web is kept substantially constant between the dryer exit nip rolls and the next nip roll pair.
- 2005: MANSOUR Industrial Complex for Glass & Mirrors, Finite Element Computation of Load Bearing Capacity of Connections in Tempered Glass Structures, 3 months, July-September. New applications of tempered glass in structural parts of buildings necessitate a good knowledge of the load-carrying capacity and the lifetime of structural glass components. In the design of high load bearing capacity structures made of tempered flat glass, connections cannot be avoided when large span or high stiffness beams (plates) are considered. The glass plates are studied under two types of loading, its own weight, and the wind load.

- 2009: The Saudi Jordanian Industrial Development Co. (JORDINA), Waste Product (cake) assessment and reduction, 3 months, July-September. The work concerns in the cake product waste reduction in JORDINA. In fact two types of waste were investigated: the visible one, which manifest itself as crumbs and the unseen one, which appear as excessive increase in the weight of the product or the thickness.
- 2010: National Cable and Wire Manufacturing Co. (CABLECO), Development and assessment of the current Maintenance module and procedures in the custom made ERP system for CABELCO and benchmarking to best practice (SAP software), 3 months, July-September. The ERP in CABELCO is a successful in-house oracle based modular software, however it still requires further development to become up to the best practice. CABELCO ERP was developed and upgraded and many missing features in comparison to SAP were added to CABELCO ERP.
- 2011: CROWN MIDDLE EAST CAN CO. LTD., Feasibility study and prototype design for absorption type chiller for air conditioning utilizing waste exhaust temperature, 3 months, July-September. It is possible to trap the heat lost and thereby using it in an absorption refrigeration system to produce a cooling system to cool various areas in the factory goes beyond 50 °C in summer. Therefore a Lithium-Bromide absorption refrigeration system with a capacity of 60000 Btu/hr (5 ton refrigeration) is designed and constructed.
- 2012: Petra Aluminum Company Ltd. Finite Element Analysis of a Glass facades supported by pre-tensioned cable trusses. This work discusses the use of ANSYS for the analysis and design of tension structures, such as cable truss structures under wind and gravity loadings. A model to describe the glass panels working in coordination with the cable truss was proposed. Under the proposed model, a FEM model of the glass panels working in coordination with the cable truss was established. The main purpose of this work is to reproduce the "Edgo Project Tension Cable Structure" performed by a Chinese group for the benefit of "Petra aluminum company Ltd".

### **Training Courses offered**

- 2013: Mechanical Seals 01/09/2013-05/09/2013 Alkhubar-Saudi Arabia. The Mechanical Seal Training Course covers a large range of Seal types and provides a detailed Seal Classification. This course provides participants with the knowledge and skills needed to understand the basics of mechanical seals. The course curriculum is centered on mechanical seal design, operation and maintenance. Its parts cover seals for static, rotating and reciprocating applications in turn. Each of these parts also includes guidance on the selection of an appropriate seal for individual

applications. The specific properties of materials used for seals or sealing systems are covered. The Failure Guide sets out typical symptoms that may be observed with failed seals and the factors to consider, many of which involve attention to the fluid system rather than the seal.

### **Objectives:**

General training course objectives include:

- Understanding the application, operation and maintenance of commonly-used designs of mechanical seals and associated support equipment.
- Understanding how to apply best practices to reduce health, safety and environmental risks.
- Gaining knowledge and competences relevant to installing, operating and maintaining mechanical seals, associated equipment and power transmission couplings.
- Applying the latest technologies and standards for specifying new plant and for improving the reliability of existing equipment.
- Troubleshoot the most common failure modes of mechanical seals.
- The interaction between mechanical seals and related equipment.

### **References:**

#### **(1) Prof. Mohammed Ahmed Hamdan**

School of Engineering

University of Jordan

Amman-11942- Jordan

Phone: (962-6) 5536636 (Residence)

(962-6) 5355000 ext.22794 .(Office)

962-(0) 777-498980 ( mobile)

Fax: (962-6) 5355588

email : [mashamdan@yahoo.com](mailto:mashamdan@yahoo.com)

[mhamdan@ju.edu.jo](mailto:mhamdan@ju.edu.jo)

#### **(2) Prof. Naser S. Al-Huniti**

Professor of Mechanical Engineering

School of Engineering

University of Jordan

Amman 11942-Jordan

E-mail: [alhuniti@ju.edu.jo](mailto:alhuniti@ju.edu.jo)

Tel. Home: 962 6 5540243

Work: 962 6 5355000 ext 22784

Mobile: 962 7 77499008

Fax 962 6 3500035

**(3) Professor** Yousef H. Zurigat  
Department of Mechanical Engineering  
School of Engineering  
University of Jordan  
Amman 11942 Jordan  
E-mail: [zurigat@ju.edu.jo](mailto:zurigat@ju.edu.jo)  
Tel: W (962)6-535-5000,  
Mobile (962)790452501

Osama M. Abuzeid, Prof. Dr.

Statement of Interest

Teaching and Research Philosophy

As a professor in mechanical engineering, my work is centered on two main branches; teaching and research. As a startup, my motivation was to make students understand what I teach, but with time and experience I am now eager to make them enjoy my lessons. Besides preciseness and conciseness, the interaction with students is a main feature of my lectures. My favorite courses are those related to building of machines; statics, dynamics, machinery, vibrations, strength of materials, machine design, failure and fracture analysis. For graduate courses I am interested also in courses that support my preference; fracture mechanics, continuum mechanics, advanced solid mechanics and finite element analysis.

My main route of research is contact mechanics, where I am interested in contact among rough surfaces. I use fractal geometry to model surface roughness and use different constitutive equations (elasticity and viscoelasticity) to model the material behavior. I also work with colleagues in other fields as second researcher especially in the field of crack identification using vibration analysis. I am now interested in light weight tensile structure, where my first paper was published in summer 2016. I am also interested in the energy economics mainly feasibilities of renewable energy projects (wind and solar). Furthermore, I am interested in analysis the demand on energy using different economical models; linear expenditure system, Almost ideal demand system, and Rotterdam system.

I have some hobbies mainly reading and playing chess.