

# CURRICULUM VITAE

## PROFESSOR RAFAT AL-WAKED

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Dept. of Mechanical and Maintenance Eng.

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### SUMMARY

Prof. Al-Waked is a professor of mechanical engineering who has proven experience as both academic and administrative leader. He has been exposed to multicultural work environment and he considers himself privileged to be working with people of different backgrounds. Recently, Prof. Al-Waked was ranked among top 2% of scientists in the world according to Stanford University.

Prof. Al-Waked has designed, delivered and evaluated engineering courses at the University of New South Wales (UNSW)-Australia, Dhofar University (DU)-Oman, Prince Mohammad Bin Fahd University (PMU)-Saudi Arabia and at the Australian College of Kuwait (ACK)-Kuwait. He has been involved in curriculum development and evaluation in addition to delivering short courses and training workshops. Throughout his teaching career, Prof. Al-Waked has been involved in interactive, collaborative and project-based teaching styles. Furthermore, Prof. Al-Waked has been a key member of program development and quality assurance teams in charge of developing paperwork required for university accreditation (OAAA, NCAAA, ABET).

Prof. Al-Waked has more than 15 years of research and development in the fields of energy efficient and sustainable systems, heat exchangers and computational fluid dynamics (CFD). So far, he has published more than 80 articles in well-recognized journals and conference proceedings with co-authors from Australia, USA, NZ, Saudi Arabia, Jordan and Malaysia. Prof. Al-Waked has established collaborative research projects with colleagues from Universiti Teknologi PETRONAS (UTP)-Malaysia. As an expert in Energy and CFD fields, Prof. Al-Waked has been an active referee for a number of international journals and research funding organisations.

### EDUCATION

**PhD** in Mechanical Engineering

Major: Thermofluid Systems/CFD

University of New South Wales, Australia, 29<sup>th</sup> of April 2005

Thesis Title: Development of Performance-Improving Structures for Power Station Cooling Towers

**MEngSc** in Mechanical Engineering

Major: Manufacturing Engineering and Management

University of New South Wales, Australia, 16<sup>th</sup> of October 1998

**BSc** in Mechanical Engineering

Major: Thermal Power

Jordan University of Science and Technology, Jordan, 18<sup>th</sup> of June 1995

**CERT IV** in Training and Assessment

TasTAFE, Australia, 11<sup>th</sup> of December 2015

### Workshops

- The Socio-Economic Impact of the Implementation of Renewable Energy, Prof. George E. Georghiou, UCY – Cyprus, February 2017
- Energy Harvesting and Nonlinear Dynamic Techniques for Young Scientists, Prof. Ali Nayfeh, ACK – Kuwait, October 2015

- ISO 9001 Appreciation and Interpretation, Lloyd's Register LRQA, ACK – Kuwait May 2015
- Developing Research Abilities, KACST, PMU - KSA, November 2012
- LabVIEW FPGA, National Instruments, PMU - KSA, March 2012
- LabVIEW Data Acquisition Systems, National Instruments, PMU - KSA, June 2011
- LabVIEW Core 3, National Instruments, PMU - KSA, June 2011
- LabVIEW Core 2, National Instruments, PMU - KSA, June 2011
- LabVIEW Core 1, National Instruments, PMU - KSA, February 2011
- NCAAA and Student advising workshops, PMU - KSA, May 2010
- Student-centred teaching workshop, Dhofar University – Oman, January 2008
- Autodesk Revit Building 9 and Systems 2- Introduction, Australia, October 2006
- Telstra and Coles site safety induction program, Australia, August 2006
- Green Star Accredited Professional Course, Australia, October 2005
- OHS General Induction for Construction Work in NSW, TAFE NSW, Australia, July 2004
- Tutor Training Workshop, University of New South Wales, Sydney – Australia, July 2001
- Lifting and Manual Handling, University of New South Wales, Australia, March 2001
- Safety in Laboratories, University of New South Wales, Australia, March 2001.

## AWARDS

*Best Professor in Mechanical Engineering (Outstanding Asian Faculty Award):* The Asian Education Leadership Awards, Dubai, UAE, September 2013

*International Internship:* The 21st Century COE of Flow Dynamics, Tohoku University, Japan, February. 2004 - April 2004

*PhD Scholarship:* The Australian Postgraduate Award (I), University of New South Wales, Australia, July 2000 - January 2004

*Teaching Scholarship:* The Supplementary Engineering Award, University of New South Wales, Australia, July 2000-January 2004.

## **Certificates of Appreciation/Accomplishment**

- The Editors of Energy and Buildings, Elsevier, Amsterdam, The Netherland, March, 2018 (Certificate of Outstanding Contribution on Reviewing)
- The Editors of Energy Conversion and Management, Elsevier, Amsterdam, The Netherland, May, 2017 and Jan, 2015 (Certificate of Outstanding Contribution on Reviewing)
- The Editors of Applied Thermal Engineering, Elsevier, Amsterdam, The Netherland, May, 2017 (Certificate of Outstanding Contribution on Reviewing)
- The Editors of Energy, Elsevier, Amsterdam, The Netherland, Dec, 2016 (Certificate of Outstanding Contribution on Reviewing)
- The Editors of Applied Energy, Elsevier, Amsterdam, The Netherland, Nov, 2016 (Certificate of Outstanding Contribution on Reviewing)
- The Editors of International Journal of Thermal Sciences, Elsevier, Amsterdam, The Netherland, Sep, 2016 (Certificate of Outstanding Contribution on Reviewing)
- Prince Mohammed Bin Fahd University, Saudi Arabia, Academic year 2012 – 2013 (Student Engagement and Interaction)
- Prince Mohammed Bin Fahd University, Saudi Arabia, Academic year 2011 – 2012 (Student Engagement and Interaction), *(the only Faculty from College of Engineering)*
- Prince Mohammed Bin Fahd University, Saudi Arabia, Academic year 2011 – 2012 (Gold level - Professional Development), *(One out of seven, University wide)*
- Prince Mohammed Bin Fahd University, Saudi Arabia, December 4th 2011 (2nd PMU Annual Science Week)
- Prince Mohammed Bin Fahd University, Saudi Arabia, Academic year 2010 – 2011 (Gold level - Professional Development), *(One out of three, University wide)*
- Prince Mohammed Bin Fahd University, Saudi Arabia, Academic year 2010 – 2011 (Student Engagement and Interaction)
- Dhofar University, Oman, Academic year 2008 – 2009 (University student activities week)

- College of Engineering, Dhofar University, Oman, Academic year 2008 – 2009 (College student activities week).

#### **AFFILIATIONS**

- American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), since 1997
- Institution of Engineers, Australia (IEAust), Since 1998
- Jordan Engineers Association (JEA), Since 1995
- University of New South Wales Alumni Association, Since 2005.

#### **EXPERIENCE**

##### ***Professor of Mechanical Engineering***

German Jordanian University ( **GJU** ), Jordan, May 2021 – Present

###### *Duties*

- Facilitating individual, group-based and work-based learning
- Preparing and delivering lectures to undergraduate engineering students
- Writing, reviewing and editing course materials, assessment methods, teaching strategies, specifications and reports
- Participating in university/college committees
- Providing leadership in scientific research (Knowledge transfer)
- Interpreting the learning environment and selecting delivery approaches which motivate and engage learners
- Comparing, reviewing, evaluating and validating assessment processes and outcomes
- Working with clients in developing and evaluating learning programs customised for individual or group needs (Kirkpatrick model)
- Identifying hazards and assessing risks in the learning environment
- Monitoring and improving work practices to enhance inclusivity and learning
- Researching information and accessing policies and frameworks to maintain currency of skills and knowledge
- Writing, reviewing and editing journal and conference technical papers.

###### *Achievements*

- Publishing 6 journal and 2 conference papers.

##### ***Associate Professor of Mechanical Engineering***

German Jordanian University ( **GJU** ), Jordan, October 2016 – April 2021

###### *Achievements*

- Publishing 16 journal and 9 conference papers.

##### ***Chairman of Mechanical and Maintenance Engineering Department***

German Jordanian University ( **GJU** ), Jordan, February 2018 – September 2019

###### *Duties*

- Taking responsibility for academic, research, facilities and financial affairs of the department
- Providing leadership to faculty, staff and students
- Managing human, financial and physical resources
- Monitoring curriculum development and support
- Performing academic planning, budgeting, advising, class scheduling and faculty evaluation
- Collaborating with Vice Rector for academic affairs, deans and other PMU administrative officers to achieve the objectives of the university.

**Associate Professor of Mechanical Engineering**

Australian College of Kuwait ( **ACK** ), Kuwait, November 2014 – August 2016

*Achievements*

- Publishing 5 journal papers and 1 conference paper.

**Adjunct Professor of Mechanical Engineering**

Jordan University of Science and Technology ( **JUST** ), Irbid-Jordan, February 2014 – October 2014.

*Achievements*

- Publishing 4 journal and 3 conference papers.

**Assistant Professor of Mechanical Engineering**

Prince Mohammad Bin Fahd University ( **PMU** ), Al-Khobar-KSA, September 2009 – August 2013

*Achievements*

- Establishing a student chapter for the American Society for Materials (ASM)
- Participating actively in PMU academic/administrative committees
- Being a key member of the quality assurance team for university accreditation (**NCAAA, ABET**)
- Publishing 9 journal papers, 9 conference papers and 2 book chapters.

**Chairman of Mechanical Engineering Department**

Prince Mohammad Bin Fahd University ( **PMU** ), Al-Khobar-KSA, September 2011 – September 2012

- *Acting Dean of college of Engineering*, July 2011 – August 2011
- *Acting Chairman of Mechanical Engineering Department*, July – August 2011
- *Acting Chairman of Mechanical Engineering Department*, July – August 2010.

*Duties*

- Taking responsibility for academic, research, facilities and financial affairs of the department
- Providing leadership to faculty, staff and students
- Managing human, financial and physical resources
- Performing Technical Competency Maps (CMaps) analysis to derive teaching and development needs
- Conducting program evaluation, faculty evaluation and student experience surveys
- Monitoring curriculum development and support
- Creating learning objectives and outcomes in accordance with Bloom's taxonomy
- Writing, reviewing and editing program learning outcomes, program annual report and periodic program self-study
- Performing academic planning, budgeting, advising, class scheduling and faculty evaluation
- Providing appropriate data and information to the College of Engineering and to the university
- Collaborating with Vice Rector for academic affairs, deans and other PMU administrative officers to achieve the objectives of the university.

*Achievements*

- Leading the department towards the adoption of a locally oriented curriculum
- Chairing PMU academic/administrative committees
- Initialising the MSc in Mechanical Engineering and the MSc in Energy Systems programs
- Increasing the number of faculty members from 7 to 11.

**Assistant Professor of Mechanical Engineering**

Dhofar University ( **DU** ), Salalah - Oman, September 2007 – August 2009

*Achievements*

- Being an active member of university accreditation committee and being the chair of college of engineering research committee

- Participating actively in DU research and student coursework self-study committees for university accreditation (**OAAA**)
- Publishing 2 journal and 2 conference papers.

### ***Mechanical Engineer***

Umow Lai Enginuity, Sydney - Australia, April 2006 – July 2007

#### *Duties*

- Conducting process improvement, modification and conceptual design
- Modelling of thermal energy applications using CFD
- Auditing and reviewing existing facilities to identify improvement opportunities, potential problems, and remedies to existing problems
- Designing and commissioning of HVAC systems according to Australian/international Standards
- Estimating cost, allocating budget and managing projects throughout their life cycles
- Participating in reviewing and approving Design project proposals and detailed design packages
- Coordinating and liaising with Contractors and Architects (on phone and in person).

#### *Achievements*

- Being a member of the design team for different projects where green and sustainable technology and/or 3D Revit modelling were adopted
- Publishing 1 journal and 2 conference papers.

### ***Green Buildings and Energy R&D Engineer***

Bassett Applied Research - Bassett Consulting Engineers, An AECOM Company, Sydney - Australia, April 2004 – January 2006

#### *Duties*

- Conducting energy optimization studies at existing and new facilities
- Running different heat balance modelling software
- Reviewing and directing engineering designs of piping systems and defining specifications for plant mechanical equipment
- Liaising with clients from multi-cultural backgrounds
- Estimating costs, preparing justifications and completing expenditure requests
- Planning and managing projects to achieve maximum profit margins
- Generating concepts and preparing forms for grant submission.

#### *Achievements*

- Modifying the air-duct system of Macarthur Square shopping centre car park, Sydney (A\$50,000 savings)
- Contributing to the winning bid for the Royal Women's Hospital, Melbourne (A\$200 million project)
- Promoting the awareness of indoor air quality via state-of-the-art designs with the aid of CFD
- Publishing 3 journal paper, 5 conference papers and more than 17 technical reports.

### ***Research Scholar***

The 21st Century COE of Flow Dynamics (Global COE Program), Institute of Fluid Science, Tohoku University, Japan, February 2004 – March 2004

#### *Duties*

- Investigating the flow of upwelling deep seawater.

#### *Achievement*

- Reporting an up-to-date literature review of upwelling deep seawater phenomenon
- Testing a CFD code capable of predicting the anisotropic turbulent viscosity of the seawater
- Establishing links with the research team at the Institute of Fluid Science (IFS).

### ***PhD Research Scholar***

School of Mechanical and Manufacturing Engineering  
The University of New South Wales, Australia, July 2000 – January 2004

#### *Description*

The PhD research work dealt with reducing the effect of crosswinds on the thermal performance of cooling towers, installed in thermal power plants, by means of windbreak walls. The research consisted of full-scale measurements, wind-tunnel experiments and numerical simulations of an operating cooling tower. Results have revealed an opportunity to save Aus\$200,000 per year for the power plant under investigation.

#### *Duties*

- Conducting, analysing and interpreting experimental and full-scale measurements
- Simulating the airflow in and around cooling towers using the CFD technique
- Attending meetings with the industrial partner to present results and work plans
- Supervising undergraduate students in their final year projects
- Writing journal and conference technical papers.

#### *Achievement*

- Quantifying the effect of crosswind on the thermal performance of cooling towers
- Developing and validating a CFD code capable of simulating dry/wet cooling towers
- Recommending windbreak walls capable of enhancing the performance of natural draught cooling towers subjected to windy conditions
- Developing links with thermal power industry partners and researchers in Australia, South Africa and Japan
- Publishing 1 journal and 7 conference papers.

### ***Teaching Assistant***

School of Mechanical and Manufacturing Engineering  
The University of New South Wales, Australia, July 2000 – January 2004

#### *Subjects taught*

- Engineering mechanics
- Fluid mechanics
- Heat transfer
- Thermodynamics
- Thermo-fluid systems
- Thermal power plants.

### ***Production Supervisor***

Skycrest Pty. Ltd., Sydney - Australia, September 1997 – July 2000.

#### *Duties*

- Running and maintaining production operations
- Supervising and motivating the production team
- Setting and up-dating production plans and inventory
- Inducting and training new and existing staff
- Conducting quality control and production analyses.

#### *Achievement*

- Increasing harmony and teamwork spirit among a multi-cultural production team
- Reducing production wastage by 10%
- Creating a self-managed production team.

## PROFESSIONAL ACTIVITIES

### University Committees

#### *German Jordanian University (GJU)*

- GJU University Council (Oct 2022 – Present)
- GJU primary Disciplinary Board (Oct 2021 – Present)
- Faculty Promotion Assessment @ GJU (Jan 2021 – Present)
- GJU Disciplinary Council for students (Jan 2021 – Sep 2021)
- SATS school council (2016 – 2019)
- SATS quality assurance committee (2016 – 2017)

#### *Australian College of Kuwait(ACK)*

- SOE internship Committee (2015 – 2016)
- MED validation and Moderation committee (2015 – 2016)

#### *Prince Mohammad Bin Fahd University (PMU)*

- University scientific council (2012 – 2013)
- University annual report committee (2011 – 2013)
- University student admission committee (2011 – 2013)
- COE quality committee (2011 – 2013)
- COE faculty affairs committee (2011 – 2013)
- COE strategic planning committee (2011 – 2013)
- COE laboratory committee (2011 – 2013)
- University credit transfer committee (2009 – 2011)
- COE selecting committee (2009 – 2011)
- COE energy steering Committee (2009 – 2011)
- COE undergraduate and accreditation committee (2009 – 2011)
- MED NCAAA accreditation coordinator (2009 – 2011)
- MED grade appeal committee (2009 – 2011).

#### *Dhofar University (DU)*

- Member of self-study committee (Faculty research) for accreditation purpose (2007-2009)
- Member of self-study committee (Student coursework) for accreditation purpose (2007-2009)
- Chair of the COE scientific research committee (2007-2009)
- Member of the COE library committee (2007-2009).

### Thesis Examination

- Adrian Mark Shuard, Doctor of Philosophy, “An Optimisation Study to Reduce the risk of Hydrate Blockages in a Flowlines”, Curtin University, Dec 2017, **PhD Thesis**.
- Adnan Abu Irshed, Master of Science in Mechanical Engineering, “Sodium hydroxide thermochemical water splitting cycle for hydrogen production utilizing waste energy from alkali metal thermoelectric converter”, Jordan University of Science and Technology (JUST), June 2023, **Master Thesis**.
- Qusai Bani Yaseen, Master of Science in Mechanical Engineering, “A novel seawater desalination system for freshwater production utilizing residual heat from nuclear power plants”, Jordan University of Science and Technology (JUST), November 2022, **Master Thesis**.
- Ibrahim Al-Keyyam, Master of Science in Mechanical Engineering, “Performance Improvement of A Solar Stirling Engine via Solar Absorption Cooling Cycle”, Jordan University of Science and Technology (JUST), January 2020, **Master Thesis**.
- Alabas Hasan, Master of Science in Mechanical Engineering, “A self-powered solar ejector cooling system supplied by thermoelectric generators”, Jordan University of Science and Technology (JUST), July 2019, **Master Thesis**.

- Almutaz ballah Algharbawi, Master of Science in Mechanical Engineering, “Thermodynamic analysis and parametric optimization of a solar organic Rankine cycle with variable geometry ejector”, Jordan University of Science and Technology (JUST), April 2019, **Master Thesis**.
- Ahmed Alajlouni, Master of Science in Mechanical Engineering, “Utilization of waste heat recovery of the internal combustion engine by thermoelectric generator inserted at combustion chamber wall”, Jordan University of Science and Technology (JUST), May 2018, **Master Thesis**.
- Khaled Qnanbeh, Master of Science in Mechanical Engineering, “A Solar Hybrid Thermoelectric Generator and Distillation System”, Jordan University of Science and Technology (JUST), Dec 2017, **Master Thesis**.

### ***International Journals***

- Guest Editor for International Journal of Rotating Machinery: Special Issue on Rotating Machinery in Renewable Energy Systems, Volume 2018, <https://doi.org/10.1155/2018/9034934>
- Reviewer for International Journals (2005 – present): Applied Energy, Applied Thermal Engineering, Energy, Energy and Buildings, Energy Efficiency, Energy Conversion and Management, International Journal of Thermal Sciences, ....

### ***International Conferences***

- Member of the Local Organizing Committee (LOC) of the 2021 Global Mosharaka Congress on Engineering and Architecture (GMC-EngArch 2021), Aqaba-Jordan, December 3-5, 2021.
- Chairman of Session F: The 4th International Conference on Viable Energy Trends (InVenT-2019), Istanbul, Turkey, April 27, 2019
- Member of the Technical Program Committee (TPC) for International Conference on Computational Materials Science and Thermodynamic Systems (CMST 2019), Hughes Hall, University of Cambridge – United Kingdom, 21-22 August, 2019
- Member of the organising committee for the 9<sup>th</sup> Jordanian International Mechanical Engineering Conference (JIMEC 9), Amman – Jordan, October 17-19, 2017.
- Member of the Technical Program Committee (TPC) for the International Conference on Solar Energy and Building (ICSoEB’ 2015), Kuching Sousse - Tunisia, 20-21 January, 2015
- Member of the Technical Program Committee (TPC) for the 2014 IEEE International Conference on Power and Energy (PECON 2014), Kuching Sarawak - Malaysia, 1-3 December, 2014
- Member of the Technical Program Committee (TPC) for the International Conference on Control Automation & Applied Mechanics (ICCAAM’ 2014), Algiers - Algeria, 25-26 November, 2014
- Member of the Technical Program Committee (TPC) for the IEEE Conference on Energy Conversion (CENCON 2014), Johor Bahru - Malaysia, 13–15 October, 2014
- Member of the advisory committee for the 4th International conference on Production, Energy and Reliability (ICPER 2014), Kuala Lumpur – Malaysia, June 3-5, 2014
- Member of the Technical Program Committee (TPC) for the International Conference on Computer Vision and Image Analysis applications (ICCVIA’ 2014), Ras Al Khaimah - UAE, 25-27 March, 2014
- Member of the Technical Program Committee (TPC) for the International Conference on Composite Materials & Renewable Energy Applications (ICCMREA’ 2014), Sousse – Tunisia, 22-22 January, 2014
- Reviewer for the 2nd Malaysian Research Conference, Auckland – NZ, December, 2012
- Member of the organising committee for the first international conference on Best Practices in Pipeline Operations & Integrity Management, Bahrain, March 19-21, 2012
- Chairman of the Track 6: Repair and Rehabilitation session at the first international conference on Best Practices in Pipeline Operations & Integrity Management, Bahrain, March 19, 2012
- Reviewer for the 5th international conference on energy research & development (ICERD5), Kuwait – Kuwait, April 9 - 11, 2012
- Reviewer for the 1st Malaysian Research Conference, Auckland – NZ, December 17 – 19, 2011
- Reviewer for the World Renewable Energy Congress, Linköping – Sweden, May 8 - 13, 2011
- Co-Chair of the Energy II session at ICEWE 2010, Amman – Jordan, December 12 - 15, 2010



- Member of the Scientific Committee-3rd IC-EpsMsO conference, Athens - Greece, July 8-11, 2009
- Chairman of the Energy Management CFD: Part II session at the 2nd ICTEA conference, Al-Ain – UAE, January 3 - 6, 2006
- Member of the organising committee for the 12th IAHR in Cooling Tower and Heat Exchangers, Sydney – Australia, November 11-14, 2001.

### **Funding Organisations**

- External Evaluator for MIT International Science and Technology Initiatives (MISTI) - MIT-Jordan Abdul Hameed Shoman Foundation Seed Fund, Massachusetts – USA, 2021 - present.
- External Evaluator for YUTP-FRG project of Universiti Teknologi PETRONAS (UTP), Malaysia, (2015 – 2017)
- Referee for General Directorate of Research Grants (GDRG) of King Abdulaziz City for Science and Technology (KACST), Kingdom of Saudi Arabia, (2011 – 2013)
- Referee for National Research Foundation (NRF), South Africa, 2008.

### **Training Workshops**

- *Preventive & Predictive Maintenance and troubleshooting*, ICMD, to SABIC employees, Al Khobar - KSA, Dec. 29, 2013 – Jan. 02, 2014 (35 hrs)
- *Gear Boxes operation and maintenance*, ICMD, to SABIC employees, Al Khobar - KSA, Dec. 22 – Dec. 26, 2013 (35 hrs)
- *Couplings, Clutches and Gears*, BPGulf, to Khafji joint operations (KJO) employees, Khafji - KSA, Sep. 3 - 5, 2013 (21 hrs)
- *Fired Heaters*, BPGulf, to Khafji joint operations (KJO) employees, Khafji - KSA, Sep. 1 - 2, 2013 (14 hrs)
- *Cooling Towers: Operation & Troubleshooting*, ICMD, to SABIC employees, Al Khobar - KSA, Oct. 29 – Nov. 02, 2011 (35 hrs).

## **SKILLS**

### **Computing**

*Software*: Microsoft Office, EES

*Thermal modelling*: IES-VE package, Carrier's HAP, DOE-eQuest

*CFD*: ANSYS, FLUENT, CFD-ACE+, CFX, FDS.

### **Languages**

*English*: orally and written

*Arabic*: orally and written.

## **RESEARCH INTERESTS**

- Computational fluid dynamics (CFD)
- Energy efficient and sustainable systems
- Cooling towers and Heat exchangers
- Indoor environment quality (IEQ).

## **TEACHING AREAS**

- Project based learning (PBL)
- Fluid mechanics
- Thermodynamics
- Heat and mass transfer
- Heating, ventilating and air conditioning (HVAC)
- Thermal power plants and alternative energy
- Computational fluid dynamics (CFD)
- Energy efficient buildings/Low Carbon buildings

- Work health and safety.

## GRANTS

### Research Projects

1. "Interaction of Aerosols and Air using Computational Fluid Dynamics," German Jordanian University, Jordan, August 2018 – 2021, (JD 55,437; US\$78,080). **PI**
2. "Energy losses inside pipelines," Prince Sultan Chair for energy research, Al Khobar - KSA, Sep. 2012 – June 2013. (SAR20,000; US\$5,334). **PI**
3. "Industrial heat and mass transfer analyses using computational fluid dynamics," Dhofar University, Oman, Dec 2008 – Sep 2009, (OMR 1000; US\$2600). **PI**

### Conference attending grants

1. "Performance of Energy Recovery Ventilators in the MENA Region," The 4<sup>th</sup> International Conference on Viable Energy Trends (InVenT-2019), Istanbul, Turkey, April 26-28, 2019 (German Jordanian University, Jordan, US\$2115).
2. "Indoor Air Environment of a Shopping Centre Carpark: CFD Ventilation Study," The 5<sup>th</sup> Annual Conference on Engineering and Information Technology (2017 ACEAIT), Nagoya, Japan, March 29-31, 2017 (German Jordanian University, Jordan, US\$2800).
3. "Indoor Energy Analysis of Food Distribution Warehouse," International Conference on Energy, Water & Environment (ICEWE 2010), Amman - Jordan, December 12-15, 2010. (PMU University, KSA, US\$1600).
4. "Indoor air quality simulations of a construction site," International Conference on Flow Dynamics (ICFD 2010), Sendai - Japan, November 1-3, 2010, (PMU University, KSA, US\$3600).
5. "Hybrid cooling of a hospital ward – CFD analysis," 3rd International Conference on Experiments /Process/System Modelling/Simulation & Optimization, Athens - Greece, July 8-11, 2009, (Dhofar University, Oman, US\$2470).
6. "Effect of Surgical Lights on the IAQ of Operating Theatres," the First International Conference on Building Energy and Environment (COBEE 2008), Dalian - China, July 13-16, 2008, (Dhofar University, Oman, US\$2470).

## THESIS SUPERVISION

### PhD Student Thesis

1. Saleem Khalefa Kadhim, "Study of Effect of Vibration Characteristics on Mechanical Artificial Heart Valve", Mechanical Engineering Department, Universiti Teknologi Petronas (UTP), Perak, Malaysia, 2013 - 2017. **(Co-Advisor)**

### Master Student Thesis

1. Omar Ibrahim Fadel Al Zu'bi, "Enhancing the performance of heat pumps by immersing the external unit in underground water storage tanks", The Faculty of Graduate Studies, Jordan University of Science and Technology (JUST), Irbid, Jordan, 2018 - 2019. **(Co-Advisor)**
2. Syed Samar Abbas, "Numerical investigation on hemodynamics and Platelet activation potential of bileaflet mechanical heart valves", Mechanical Engineering Department, Universiti Teknologi Petronas (UTP), Perak, Malaysia, 2017 - 2019. **(Co-Advisor)**
3. Syed Ali Hasnain, "Numerical investigation on the effect of down stand structure on smoke contamination in atrium upper balconies", Mechanical Engineering Department, Universiti Teknologi Petronas (UTP), Perak, Malaysia, 2013 - 2015. **(Co-Advisor)**

### Senior Student Graduation Project

1. Yazeed Alabed, " System Engineering with SysML Version 2", Mechanical and Maintenance Engineering Department, German Jordanian University (GJU), Amman – Jordan, Spring 2022 - 2023. In collaboration with Dr. Qian Liu Robert Bosch GmbH, Germany.

2. Omar Frietekh, " Setup & Calibration of a New Pipe Test Facility for Laminar Flow Studies", Mechanical and Maintenance Engineering Department, German Jordanian University (GJU), Amman – Jordan, Spring 2021 - 2022. In collaboration with Prof. Dr.-Ing. El-Sayed Zanoun German Composite Scientific Staff member of Aerodynamics and Fluid Mechanics Department, LAS, BTU, Germany.
3. Yahya Al-Shammari, " Optimization and Development of the Manufacturing Process for Composite-reinforcements in an Innovative AFM Rotor", Mechanical and Maintenance Engineering Department, German Jordanian University (GJU), Amman – Jordan, Fall 2021 - 2022. In collaboration with Eng. Michael Antonof German Composite GmbH&Co. KG. Ger, Germany.
4. Yazeed Alassaf and Yazan Rumman, " Waste to Energy: Amman as a Case Study", Mechanical and Maintenance Engineering Department, German Jordanian University (GJU), Amman – Jordan, Fall 2020 - 2021.
5. Tariq Tsey, " Designing a mixing chamber for Date palm pollination", Mechanical and Maintenance Engineering Department, German Jordanian University (GJU), Amman – Jordan, Spring 2019 - 2020.
6. Fadi Wakileh, " Cooling of PV panels using PCM", Mechanical and Maintenance Engineering Department, German Jordanian University (GJU), Amman – Jordan, Fall 2019 - 2020.
7. Tareq Abu Dahab, " Studying a Dry Powder Inhaler (DPI)", Mechanical and Maintenance Engineering Department, German Jordanian University (GJU), Amman – Jordan, Fall 2019 - 2020.
8. Abdalrahman Yassin and Abdallah Adwan, "*Performance based ventilation of underground carpark*", Mechanical and Maintenance Engineering Department, German Jordanian University (GJU), Amman – Jordan, Fall 2018 - 2019.
9. Ali Zabalawi, " Validation of the simulation software results of polymer films by means of a thermoforming process", Mechanical and Maintenance Engineering Department, German Jordanian University (GJU), Amman – Jordan, Spring 2018 - 2019. In collaboration with Prof. Dr.-Ing. Herbert Reichel of the Institute for Materials Science (ifm) at Hof University of Applied Sciences.
10. Ahmad Kokash, Mohammad Alsughiar and Yazan Alalmat, "*Ventilation system capacity study for mall indoor car park*", Mechanical and Maintenance Engineering Department, German Jordanian University (GJU), Amman – Jordan, Fall 2017 - 2018.
11. Hazem Al-Qteishat, Laith Al-Khresheh, Yazeed Tuffaha, Yazan Abu-alhayja and Waleed Kalbouneh, "*Peak cooling load shifting for green buildings* ", Mechanical and Maintenance Engineering Department, German Jordanian University (GJU), Amman – Jordan, Fall 2016 - 2017.
12. Ghazi K Al Arfaj, Khaled Al Awwad, Hamad Al Boali and Yasser H. Alhammad, "*Energy losses inside pipelines* ", Mechanical Engineering Department, Prince Mohammad Bin Fahd University (PMU), Al Khobar – Saudi Arabia, Fall 2012 - 2013.
13. Ali Al Shagab, Ali Al-Momen, Kumail Al-Zubail and Hussain AlShaqab, "*Fluid structure interaction : jet engine compressor case study*", Mechanical Engineering Department, Prince Mohammad Bin Fahd University (PMU), Al Khobar – Saudi Arabia, Spring 2011 - 2012.
14. Rakan Al-Sehli, Sultan Al-Sehli and Ahmed Al-Ghamdi, "*Building and designing automotive vehicle*", Mechanical Engineering Department, Prince Mohammad Bin Fahd University (PMU), Al Khobar – Saudi Arabia, Spring 2011 - 2012.
15. Najeeb Al-Harbi, Mohammad Al-Sadah and Mohammed Al-Khaldi, "*Impact of water jet force*", Mechanical Engineering Department, Prince Mohammad Bin Fahd University (PMU), Al Khobar – Saudi Arabia, Fall 2011 - 2012.
16. Hassan Kabli, Ali Al-Zubail and Mohammed Alghuneim, "*Evaluation of wind energy as a power generation source in three locations in Saudi Arabia*", Mechanical Engineering Department, Prince Mohammad Bin Fahd University (PMU), Al Khobar – Saudi Arabia, Fall 2011 - 2012.
17. Fawaz Al-Saleh and Jassim Al-Ghimas, "*Unmanned aerial vehicle prototype (UAV)*", Mechanical Engineering Department, Prince Mohammad Bin Fahd University (PMU), Al Khobar – Saudi Arabia, Fall 2011 - 2012.

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19. Mohammed AL Shanfari and Said AL Amri, "*Crane spreader: failure analysis and performance enhancement*", Mechanical Engineering Department, Dhofar University (DU), Salalah - Oman, Spring 2008 - 2009.

## PRESENTATIONS

### Conferences

1. *CFD Simulation of Ducted Mechanical Ventilation for an Underground Car Park*, presented at the 1<sup>st</sup> International Conference on Mechanical, Aeronautical, and Industrial Engineering Technologies (MechaniTek 2020), **Remotely**, Irbid, Jordan, 2020.
2. *Performance of Energy Recovery Ventilators in the MENA Region*, presented at the 4<sup>th</sup> International Conference on Viable Energy Trends (InVenT-2019), Istanbul, Turkey, 2019.
3. *Indoor Air Environment of a Shopping Centre Carpark: CFD Ventilation Study*, presented at the 5<sup>th</sup> Annual Conference on Engineering and Information Technology (2017 ACEAIT), Nagoya, Japan, 2017.
4. *Potential value of waste-to-energy facility in Riyadh city - Saudi Arabia*, presented at the 8<sup>th</sup> Jordanian International Mechanical Engineering Conference (JIMEC'8), Amman, Jordan, 2014
5. *Indoor energy analysis of food distribution warehouse*, presented at the International Conference on Energy, Water & Environment (ICEWE 2010), Amman, Jordan, 2010.
6. *Indoor air quality simulations of a construction site*, presented at the 7<sup>th</sup> International Conference on Flow Dynamics (ICFD 2010), Sendai, Japan, 2010.
7. *Terwindle rest home fire investigation and code compliance*, presented at the 3<sup>rd</sup> SFPE-SAC Fire Technology Conference & Exhibition, Al-Khobar, KSA, 2010.
8. *Effect of façade type on the cooling load of a multi-storey building*, presented at the International Engineering Conference on Hot Arid Regions (IECHAR 2010), Al-Ahsa, KSA, 2010.
9. *Operating theatre, IAQ and ventilation strategies - CFD analysis*, presented at the 2nd International Conference on Thermal Engineering Theory and Applications, ICTEA 2006, Al Ain, United Arab Emirates, 2006.
10. *Natural ventilation of Perth seawater desalination plant - CFD analysis*, presented at the 2nd International Conference on Thermal Engineering Theory and Applications, ICTEA 2006, Al Ain, United Arab Emirates, 2006.
11. *Enhancing the performance of natural draft dry cooling towers*, presented at the 2nd International Conference on Thermal Engineering Theory and Applications, ICTEA 2006, Al Ain, United Arab Emirates, 2006.
12. *Simulation of two-phase heat and mass transfer inside natural draft wet cooling towers*, presented at the 5th International Conference on Multiphase Flow, Yokohama - Japan, June-2004
13. *Effect of windbreak walls on the performance of natural draft dry cooling towers under crosswind: CFD study*, presented at the 2nd International Conference on Heat Transfer, Fluid Mechanics and Thermodynamics, Victoria Falls - Zambia, June-2003.
14. *Numerical modelling and validation of natural draught cooling towers under crosswind*, presented at the 12th IAHR Symposium in Cooling Tower and Heat Exchangers, Sydney - Australia, November-2001.
15. *Development of Performance-Improving Structures for Power Station Cooling Towers*, presented at the annual Postgraduate Conference of the School of Mechanical and Manufacturing Engineering – UNSW, Sydney, Australia, July-2000: July-2004.

### Lectures

1. *Indoor energy analysis of food distribution warehouse*, presented at King Fahd University of Petroleum and Minerals (KFUPM), Al Dhahran - KSA, December - 2010.

2. *CFD research on natural draft cooling towers at UNSW*, presented at Tohoku University, Sendai - Japan, February - 2004.
3. *Effect of crosswinds on the performance of natural draft dry cooling towers*, presented at the University of Stellenbosch, Stellenbosch - South Africa, June-2003.

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### *International Journal Papers*

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6. Al-Nimr M., **Al-Waked, R.** and Al-Zu'bi O., "Enhancing the performance of heat pumps by immersing the external unit in underground water storage tanks," *Journal of Building Engineering*, vol. 40, No. 8, article 102732, 2021. (<https://doi.org/10.1016/j.jobbe.2021.102732>)
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8. Abushgair K., **Al-Waked, R.**, "Effects of Coating Materials as a Cleaning Agent on the Performance of Poly-Crystal PV Panels," *Coatings*, vol. 11, No. 5, article 544, 2021. (<https://doi.org/10.3390/coatings11050544>)
9. **Al-Waked R.**, Bani Mostafa D. & Nasif M.S., "Performance of energy recovery ventilators under different climatic regions". *Energy Efficiency*, vol. 14, No 1, Article 8, 2021. (<https://doi.org/10.1007/s12053-020-09917-w>)
10. **Al-Waked R.**, Yassin A., Adwan A. and Mostafa D.B., "Effects of Cross Level Air Interaction within Multilevel Underground Car parks on Indoor Air Quality". *Fluids*, vol. 5, No. 4, pp. 177-, 2020. (<https://doi.org/10.3390/fluids5040177>)
11. Nasif M., **Al-Waked R.** and Ismail F., "Numerical investigation on the effect of varying the number of flow dividers on Z- Shaped membrane heat exchanger performance," *Malaysian Journal of Fundamental and Applied Sciences*, vol. 16, No. 1, pp. 85-89, 2020. (<https://doi.org/10.11113/mjfas.v16n1.1642>)
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3. **Al-Waked R.**, "CFD Simulation of Ducted Mechanical Ventilation for an Underground Car Park," The 1<sup>st</sup> International Conference on Mechanical, Aeronautical, and Industrial Engineering Technologies (MechaniTek 2020), Irbid, Jordan, pp. 12-17, June 16-18, 2020.
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5. **Al-Waked R.** and Bani Mostafa D., "Performance of energy recovery ventilators in the MENA region," The 4<sup>th</sup> International Conference on Viable Energy Trends (InVenT-2019), Istanbul, Turkey, April 26-28, 2019.
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**INDUSTRIAL PROJECTS (Australia: April 2004 – July 2007)**

Application	Project Name	Role	Tasks
Car park	Musk Avenue	Energy Efficiency Specialist	IAQ study and CFD simulation
Car park	MacArthur Square		IAQ study and CFD simulation
Car park	Rhode Watersid		IAQ study and CFD simulation
Car Park	Earlwood office complex	HVAC Engineer	Natural and mechanical ventilation
Commercial	Department of housing- Cavill		Tenancy fit out and energy auditing
Commercial	Woolworth RDC - Brisbane	Energy Efficiency Specialist	IAQ study and CFD simulation
Commercial	Woolworth RDC – GEPPS Cross, Adelaide		Thermal analysis and CFD simulation
Commercial	Rhodes Retail Development		IAQ study and CFD simulation
Commercial	Citrix-Sydney	Project Manager	Upgrading the communication room including Mechanical, Electrical and fire services.
Commercial	Coffey - Chatswood	HVAC Engineer	Tenancy fit out
Commercial	TELSTRA		Mech., Elec. and fire services auditing
Educational	Faculty of Law, UNSW	Energy Efficiency Specialist	IAQ study and CFD simulations
Educational	Bonython hall - Adelaide		Human comfort and CFD simulation
Educational	Ultimo TAFE Library	HVAC Engineer	Energy auditing and mechanical services design
Education	Bethany College		CFD simulation and natural ventilation
Education	Berry Sport Hall	Energy Efficiency Specialist	CFD simulation and natural ventilation
Hospitals / Laboratories	Johnson Medical		Energy management and CFD simulation
Hospitals / Laboratories	Royal Women Hospital - Melbourne		IAQ study and CFD simulation
Hospitals / Laboratories	Sonic Healthcare		Thermal analysis and energy management
Hospitals / Laboratories	Tauranga Hospital -Auckland		IAQ, cross infection studies and CFD simulation
Hospitals / Laboratories	New Caledonia Accommodation	HVAC Engineer	Design and modelling mechanical services using REVIT software
Research and development	Intelligent Building Facade	R&D Engineer	Product improvement
Residential	Red Head	HVAC Engineer	Split system design and costing
Residential	Brown Head		Central system design and costing
Residential	Resitech		Fire services auditing
Shopping centre	Windsor Shopping Centre	Energy Efficiency Specialist	CFD simulation and IAQ study
Shopping centre	Woolworth Shopping Centre		CFD simulation
Thermal modelling	Perth Seawater Desalination Plant - Perth		CFD simulation and natural ventilation
Thermal modelling	Bethany College	HVAC Engineer	HVAC design and CFD simulation
Thermal modelling	Saint Gobain Abrasives	Project Manager	CFD simulation, evaporation analysis, product development and cost reduction
Thermal modelling	413 - 421 George Street	Energy Efficiency Specialist	ESD and ABGR analysis in addition to CFD simulation
Thermal modelling	Climate Control		Educational materials development
Thermal modelling	Glenmore Park		NatHERS thermal analysis