



CURRICULUM VITAE

DR. TUTY ASMA BT ABU BAKAR

Senior Lecturer

Department of Materials, Manufacturing & Industrial Engineering

Faculty of Mechanical Engineering,

Universiti Teknologi Malaysia,

81310 UTM Johor Bahru, Johor, Malaysia.

<http://www.staff.blog.utm.my/tuty/>

Office Tel. No. : +607- 5534707

Fax No.: +607-5566159

Mobile Phone: +6019 - 2837275

E-mail: tuty@mail.fkm.utm.my

Area of Specialisation:

Materials Engineering; Welding metallurgy and its application in oil and gas industries, Surface engineering, PVD coatings, Nickel Titanium & Cu Based Shape Memory Alloys (Bulk & Coating), and tribology.

Research Interest:

Surface engineering, PVD and EPD coatings; hard coatings for tribological and biomedical applications
Shape memory alloy materials; Bulk and coating
Self-healing tribological surface

1. EDUCATION BACKGROUND

- 1997 : B Eng. (Hons) Material Engineering
Universiti Sains Malaysia (USM), Penang.
- 1998 : Master degree in Materials Engineering
Universiti Sains Malaysia (USM), Penang.
- 2010 : PhD in Mechanical Engineering (Materials Engineering)
Dublin City University (DCU), Dublin, Ireland
PhD Thesis Title: Tribological investigation of Nickel-Titanium Shape
Memory Alloy (NiTi SMA) Coatings

2. PROFESSIONAL AFFILIATIONS

1. Member of Institute of Materials Malaysia (IMM) since 1999, Membership No.: 220.
2. Life Member of Electron Microscopy Society of Malaysia (EMSM), Membership No: T009.
3. Life member of Malaysian Tribology Society, Membership No. L1313
4. Member of Society of Engineering Education Malaysia (SEEM)
5. Member of Institute of Engineers Malaysia (IEM), Membership No.: 53779
6. Member of Board of Engineer Malaysia (BEM) – graduate engineer no.: 72017A

3. CAREER HISTORY

- 1998-2006 : Lecturer
Department of Materials Engineering
Faculty of Mechanical Engineering
Universiti Teknologi Malaysia, Skudai, Johor
- 2006-2010 : Study Leave for PhD degree (Dublin City University), Dublin, Ireland.
- 2011- Present : Senior Lecturer
Department of Materials, Manufacturing & Industrial Engineering
Faculty of Mechanical Engineering
Universiti Teknologi Malaysia, Skudai, Johor.

4. TECHNICAL SKILLS

- i. Welding metallurgy and its application in oil and gas industries; Welding processes & Non Destructive Examination (NDE) for welded test piece
- ii. Cu- based shape memory alloy structure and properties
- iii. Physical Vapour Deposition (PVD) process; TiN and NiTi shape memory alloy coatings using the magnetron sputtering technique.
- iv. Characterisation and Failure analysis of bulk materials and coatings

5. ADMINISTRATIVE RESPONSIBILITIES

- i. Editor for the International Journal of the Institute of Materials Malaysia (IJIMM), from September 2013 to present
- ii. UTM representative for Industrial Standard for Metal and Partial Product Committee, from 27 December 2010 to present.
- iii. Secretary of Institute of Materials Malaysia - Southern Region (2011 – present)
- iv. Materials Engineering Program Coordinator (18 January 2013-16 September 2013)
- v. Head of Materials Engineering Panel (March 2012 – 17 January 2013)
- vi. Acting as the Postgraduate Coordinator for Materials Engineering Program (6 February 2012 – 4 May 2012)
- vii. Head of Materials Science Laboratory, Faculty of Mechanical Engineering, UTM (1 Feb 2001 – 30 April 2005)
- viii. Coordinator for Experimental Methods (SKMM2912) – SEM1 2012/2013
- ix. Coordinator for Materials Engineering course (SME 3623) – SEM 2 2011/2012
- x. Coordinator for Materials Science course (SME 1613) – SEM 2 2010/2011, SEM 2 2004/2005, SEM 2 2003/2004 and SEM 1 2002/2003.
- xi. Coordinator for Materials Technology course (SME 3622) – SEM 1 2005/2006 and SEM 1 2003/2004.

6. AWARD

- i. UTM Excellence service award ;2012
- ii. Best Presentation Award in the Symposium of Mechanical Engineering Research & Practice (SMERP 2009), Dublin, Ireland.
- iii. Excellence Presentation Award in the Symposium of Mechanical Engineering Research & Practice (SMERP 2009), Dublin, Ireland.
- iv. UTM/SLAB academic scholarship for PhD in Dublin City University, Dublin, Ireland (2006 – 2010).
- v. UTM Excellence service award; 2002

7. TEACHING RESPONSIBILITIES

7.1 Lectures and Laboratory Supervision (1998- present)

SUBJECT CODE	SUBJECT NAME	LEVEL	UNDERGRADUATE COURSE
SMJ 2921	Materials Science Lab	2 nd year	B. Eng (Mechanical - Materials) B. Eng (Mechanical) - SPACE
SMJ 3931	Materials Science Lab	3 rd year	B. Eng (Mechanical – Materials) B. Eng (Mechanical) – SPACE
SME 4942	Materials Science Lab - Module	3 rd year	B. Eng (Mechanical - Materials) B. Eng (Mechanical) - SPACE
SME 3931	Manufacturing Lab	3 rd year	B. Eng (Mechanical) B.Eng (Industrial) B.Eng (Manufacturing)
SME 1613	Materials Science	2 st year	B. Eng (Mechanical - Automotive) B. Eng (Mechanical - Aeronautic) B. Eng (Mechanical – Automotive) B. Eng (Mechanical) - SPACE
SME 3623	Materials Technology	3 rd year	B. Eng (Mechanical) B. Eng (Mechanical) - SPACE
SMH3632	Advanced Materials	3 rd year	B. Eng (Mechanical - Materials)
MMJ1163	Advanced Engineering Materials	Master	Master Degree in Mechanical Engineering
SME 3623	Materials Engineering	3 rd year	B. Eng (Mechanical)
SKMM1912	Experimental Methods	1 st year	B. Eng (Mechanical)
SKMM2713	Manufacturing Processes	2 nd year	B. Eng (Mechanical)
MMB2763	Surface Engineering	Master	Master Degree in Materials Engineering

7.2 Undergraduate Supervision

1. Norizal Bin Saat, Deposition of HA powders onto AZ31 magnesium alloy substrates using the electrophoretic process, 2013
2. Abdul Hakim Umbaidilah, The effect of aging on the structure and hardness of Cu based shape memory alloys, 2013
3. Tok Hong Yuan, Morphology, surface roughness and adhesion property of various hard coating for tribological application, 2013

4. Siti Hawa Bt Mohamed, Structure and adhesion property of deposited nickel –titanium onto 316L stainless steel, 2013
5. Muhammad Yusri Bin Bujang, Corrosion behavior of austenitic stainless steel type AISI 316L in chloride environment, 2012
6. Roslinah Ali Hasan, The effect of aging process on the microstructures and mechanical properties of Aluminium Alloy, 2005.
7. Mohd Fauzi Mohd Sholeh, Effect of organic compound on corrosion resistance of brass, 2005.
8. Abu Mansor Muhamad Nor, Study the effect of different filler materials on mechanical properties of polypropylene, 2005.
9. Mohd Hairi Zahari, Study the effect of heat treatment on the mechanical properties of brass (70/30), 2005.
10. Peter anak Lamat, Study the effect of corrosion on the mechanical properties of carbon steel, 2005.
11. Muhammad Ilyas Abdul Karim, Investigate the effect of nitriding process on the surface hardness of carbon steel, 2004.
12. Ong Hong Uo, Corrosion behaviour of copper and copper alloy using immersion test, 2004.
13. Khairul Anuar Ramli/Mansur, Investigate the corrosion behaviour of Al-Si (LM25) Alloy, 2003.
14. Nuraishah Mohd Yatim, Kajian kesan bahan pengisi ke atas sifat mekanik termoplastik polipropilena, 2003.
15. Azmah Hanim Mohamad Ariff, The effect of ageing on LM25 and without 0.05% Strontium – microstructure and mechanical properties, 2003.
16. Mohd Hasnan Abdul Rahman, Development of experimental simulation method for thermal dissipation in electronic components, 2002.
17. Yam Chean Loon, The influence of filler on mechanical properties of thermoplastic materials, 2002.
18. Siti Zamyah Mohd Yunus, Effect of ageing heat treatment on the microstructure and mechanical properties of Al alloys, 2002.
19. Cheong Kok Hou, Corrosion behaviour of cast Aluminium metal matrix composites, 2001.
20. Bong Kian Keong, Effect of processing condition on the microstructure and mechanical properties of brass, 2001.
21. Tai Siew Fong, Effect of ageing treatment on the mechanical properties of silicon carbide reinforced aluminium based metal matrix composite, 2000.
22. Wong Cheong Sean, Processing and mechanical properties of Alumina particulate reinforced Al alloys, 1999.

7.3 Postgraduates Supervision

1. PhD : Electrophoretic Deposition of MgO/HA composite coating on AZ31 Mg Alloy for Bio-medical applications
Chong Chin Yee (2012-present) – main supervisor
2. PhD : Characterization of As-cast Cu-Al-Ni Shape Memory Alloy for Seismic Applications
Wee Ying Ci (2012-present) – main supervisor
3. PhD : Melt Treatment with addition elements and superheating on Mg₂Si Reinforcement in Al-Mg-Si Metal Matrix Composite
Nur Azmah Nordin (2012 – present) –main supervisor

4. PhD : Effect of alloying elements and heat treatment on the properties of Cu-Al-Ni Shape Memory Alloys
Safaa Najah Saud (2011-present) – co-supervisor.
5. Master : Whisker growth in Tin surface finishes by immersion Tin Plating and Hot Dipping (by research)
Lim Hooi Peng (2011-present)- co-supervisor
6. Master: Solder improvement by controlling the whisker growth (by research)
Siti Zahira Yusuff (2012 – present) – co- supervisor.
7. Master: The effect of aging treatment on the thermodynamic parameters of Cu-Al-Ni Shape Memory Alloys(by taught course)-main supervisor
Ali Abed Shakir (2013-present)
8. Master : Characterisation of amorphous and crystalline Nickel Titanium Shape Memory Alloy coating for tribological applications (by mix-mode program)-main supervisor
Abdul Hadi Abdul Aziz (2010-2012/completed).

8. RESEARCH ACTIVITIES

- Development of self- healing coating for anti-fouling of structures in the marine environment **(Project Leader)**, RUG-Tier 1 from April 2012-31 March 2014, RM100,000 – on-going project.
- Influence of Alloying Elements and Aging on Martensitic Transformation Temperature of Cu-based Shape Memory Alloys **(Project Leader)**, FRGS , MOHE grant (cycle 1/2012) – from 1 April 2012 – 30 September 2014, RM83,360 – on-going project.
- Interface Bonding Properties Enhancement in Thermal Barrier Coating for Laser Hardened Die Steel **(co-researcher)**, FRGS, MOHE GRANT (cycle 1/2012) – from 1 April 2012 – 31 March 2014, RM 79,000 – on-going project.
- Development of MgO/Hap composite coating on AZ31 Mg Alloy using the electrophoretic deposition process **(Project Leader)** Research University Grant – from 1 Dec 2012 – 31 Dec 2013, RM50,000 – completed
- Development and characterization of amorphous and crystalline nickel titanium shape memory alloy coating for tribological applications. **(Project Leader)** Research University Grant – from 1 April 2011 to 31 July 2012, RM40, 000) – completed
- Development of Nickel Titanium Shape Memory Alloy Coatings (from 2006 – until 2010). (SLAB, UTM & Dublin City University, Dublin, Ireland) – completed
- Development of Experimental Simulation Method for Thermal Dissipation in Electronic Components, 2000 – 2001, **(Project Leader)** Short term grant - UTM. Vot.:71662 (RM15,000)-completed

9. CONSULTATION ACTIVITIES

- Failure analysis of pineapple slice can for Pineapple Cannery of Malaysia Sdn. Bhd, 2005.
- Coating thickness analysis for Menoura Industries, 2005.
- Rusty wire rod investigation for Kiswire Cord Sdn. Bhd., 2005.
- Analysis work to determine the source and the type of leak tube samples and deposit thickness for 2 units boiler Sultan Iskandar power station, Pasir Gudang, 2004.
- Examination of boiler & reheated tubes for Tenaga Nasional Berhad, Pasir Gudang, Johor, 2003.
- Welding Examination for Affico Holdings Sdn. Bhd., 2003.
- Failure analysis of torsion spring for Micro Fine technology Sdn. Bhd, 2002.
- Investigation and analysis on microstructure, grain size and hardness of steel plate, 2002

10. TECHNICAL CONTRIBUTION & International Contribution

1. Technical reviewer for the International Conference on Advances in Materials and Processing Technologies (AMPT 2009), Manama, Bahrain
2. Technical reviewer for the 8th International Materials Technology Conference and Exhibition (IMTCE 2012), Kuala Lumpur, Malaysia.
3. Asean Conference on Civil, Materials and Environmental Sciences Committee, March 2013.
4. Technical reviewer for the ICAMN III 2013

11. ACADEMIC CONTRIBUTION

Contribution as an External Examiner For Viva-Voce

1. Nur Farhani Ismail (Master Thesis – UTHM) : Consolidation of single and double layer ceramic structure, 4 September 2012
2. Noor Haafiza Mohd Idrus (Master Thesis – UTHM) : Anodic Oxidation of Titanium in Acid Suphuric Solution (H₂SO₄) for biomedical application, 2013

Contribution as an Internal Examiner For Viva- Voce

1. Layla Suhail Najm (Master Thesis) – (July 2012)
2. Laila Masrus Mohd Nasir (Master Thesis) – High Speed Nickel Electroplating on Aluminium (March 2012)
3. Nurhanna Mohd Zaidan (Masters Thesis) – Gel Cast of Ceramic Membrane For Water Filtration (March 2012)

12. PUBLICATIONS

1. Saeed Farahany, Ali Ourdjini, Tuty Asma Abu Bakar, Mohd Hasbullah Idris, A new approach to assess the effects of Sr and Bi interaction in ADC12 Al-Si die casting alloy, *Thermochimica Acta* 575 (2014) 179-187.
2. N. A. Nordin, S. Farahany, A. Ourdjini, T.A.Abubakar, E.Hamzah, Evaluation of the Effect of Bismuth on Mg₂Si Particulate Reinforced in Al-20%Mg₂Si in-situ composite, *Advanced Materials Research*, Vol.845 (2014) pp.22-26.
3. Safaa N. Saud, E.Hamzah, T.A. Abubakar, Azadeh Refaei, R.Hossenian, The Influence of γ -irradiation on the structure and properties of the Cu-11.5 wt.% Al-4wt.% Ni Shape Memory Alloys, *Advanced Materials Research*, Vol. 845 (2014) pp.128-132.
4. E. M. Nazim, S. Izman, A. Ourdjini, T. Abubakar, H. Mas-Ayu, Adhesion Strength of HFCVD Diamond Coating on WC Substrate Seeded With Diamond and Different Ratios of SiC Powders, *Advanced Materials Research*, Vol. 845 (2014) pp. 467-471.
5. Nur Azmah Nordin, Saeed Farahany, Ali Ourdjini, Tuty Asma Abu Bakar, Esah Hamzah, Refinement of Mg₂Si Reinforcement in a commercial Al-20% Mg₂Si in-situ composite with bismuth, antimony and strontium, *Materials Characterisation* , 86 (2013) pp.97-107.
6. Safaa N. Saud, E. Hamzah, T. Abubakar, Raheleh Hosseinian, A Review on influence of alloying elements on the microstructure and mechanical properties of of Cu-Al-Ni Shape Memory Alloys, *Jurnal Teknologi* 64:1 (2013)pp. 51-56.
7. Safaa N. Saud, E. Hamzah, T. Abubakar, S. Farahany, Structure-Property Relationship of Cu-Al-Ni-Fe Shape Memory Alloys in Different Quenching Media, *Journal of Materials Engineering and Performance*, Available online on 25 October 2013/09/2013.

8. Safaa N. Saud, E. Hamzah, T. Abubakar, A. Abdolahi, Influence of the addition of carbon nanotubes on the structure-properties of Cu-Al-Ni Shape Memory Alloys, *Materials Science and Technology*, 09/2013.
9. Nur Azmah Nordin, Saeed Farahany, Ali Ourdjini, Tuty Asma Abu Bakar, Esah Hamzah, Refinement of Mg₂Si Particulate Reinforced Al-20% Mg₂Si in-situ composite with addition of Antimony, accepted to publish in *Applied Mechanics and Materials* in 2014.
10. Safaa N Saud, K. V. Rajulapati, E. Hamzah, T. Abu Bakar, Raheleh Hosseinian. S, KVD Prasad. Effect of submerged arc welding variables on the abrasive wear resistance of lincore 60-0 hardfacing materials. Accepted to publish in *Jurnal Teknologi*, in 2014.
11. E.Hamzah, Safaa N. Saud, T.A. Abubakar, Effect of Aging Treatment on the Microstructures and Tensile Properties of Cu-Al-Ni-Co Shape Memory Alloys, published in *International Symposium on Advanced Materials 2013, Ishikawa, Japan proceedings*.
12. T. Abubakar, M. Rahman and J. Stokes. Effect of annealing treatment on the wear properties of Ni rich NiTi alloy coatings. *Advanced Materials Research*, Vol.686 (2013) pp.192-200.
13. Abubakar, T., Rahman, M., Dowling, D.P., Stokes, J., Hashmi, M.S.J. (2010). Adhesion performance of TiN coating with amorphous NiTi Alloy interlayer onto 316L stainless bio steel deposited by sputtering process. *Surface Engineering*, 26(7), pp. 499-505.
14. Abubakar, T., Rahman, M., Dowling, D.P., Stokes, J., Hashmi, M.S.J. (2010). Mechanical performance of the annealed NiTi Shape Memory Alloy coating onto 316L stainless bio steel. *Defect Diffusion Forum*, 297—301, pp. 365-369.
15. Abubakar, T., Rahman, M., Dowling, D.P., Stokes, J., Hashmi, M.S.J. (2009). Characterisation of NiTi Shape Memory Alloy coating for tribological applications. *Proceedings of the IV ECCOMAS Thematic Conference on Smart Structure and Materials, Porto, Portugal*, pp. 463-472.
16. Ali, O & Tuty, A. A. B. (2000). Corrosion behaviour of cast aluminium-silicon alloy reinforced with silicon carbide particles. *9th Conference of Electron Microscopy Society of Malaysia*, pp. 253-255.

12. PRESENTATION (ORAL/POSTER/SEMINAR)

1. Nur Azmah Nordin, Saeed Farahany, Ali Ourdjini, Tuty Asma Abu Bakar, Esah Hamzah, Refinement of Mg₂Si Particulate Reinforced Al-20% Mg₂Si in-situ composite with addition of Antimony, presented in the 2nd International Conference on Recent Advances Engineering and Mobility Research in Automotive (RECar2013 on 16-18 Dec 2013).
2. E. M. Nazim, S. Izman, A. Ourdjini, T. Abubakar, H. Mas-Ayu, Adhesion Strength of HFCVD Diamond Coating on WC Substrate Seeded With Diamond and Different Ratios of SiC Powders, presented in 1st International Materials, Industrial and manufacturing Conference (MIMEC 2013 on 4 – 6 Dec 2013).
3. Safaa N. Saud, E.Hamzah, T.A. Abubakar, Azadeh Refaei, R.Hossenian, The Influence of γ -irradiation on the structure and properties of the Cu-11.5 wt.% Al-4wt.% Ni Shape Memory Alloys, presented in 1st International Materials, Industrial and manufacturing Conference (MIMEC 2013 on 4 – 6 Dec 2013).
4. N. A. Nordin, S. Farahany, A. Ourdjini, T.A.Abubakar, E.Hamzah, Evaluation of the Effect of Bismuth on Mg₂Si Particulate Reinforced in Al-20%Mg₂Si in-situ composite, presented in 1st International Materials, Industrial and manufacturing Conference (MIMEC 2013 on 4 – 6 Dec 2013).
5. E.Hamzah, Safaa N. Saud, T.A. Abubakar, Effect of Aging Treatment on the Microstructures and Tensile Properties of Cu-Al-Ni-Co Shape Memory Alloys, presented in *International Symposium on Advanced Materials 2013, Ishikawa, Japan* on 17 – 18 October 2013.

6. Safaa N Saud, K. V. Rajulapati, E. Hamzah, T. Abu Bakar, Raheleh Hosseinian. S, KVD Prasad. Effect of submerged arc welding variables on the abrasive wear resistance of lincore 60-0 hardfacing materials. presented in the 1st International Science Postgraduate Conference ISPC 2012 (27-30 November 2012).
7. Safaa N Saud, E.Hamzah, T. Abubakar, The effects of quenching media on the microstructure and properties of Cu-Al-Ni Shape Memory Alloys, presented in the 21th Scientific Conference of the Microscopy Society Malaysia (MSM), 24-26th November 2012).
8. T. Abubakar, M. Rahman and J. Stokes. Effect of annealing treatment on the wear properties of Ni rich NiTi alloy coatings. presented in the 8th International Materials Technology Conference & Exhibition (IMTCE2012), Kuala Lumpur, Malaysia, July 9 – 12, 2012.
9. Safaa N. Saud, E. Hamzah, T. Abubakar, Raheleh Hosseinian. S. Influence of alloying elements on microstructure and mechanical properties of Cu-Al-Ni Shape Memory Alloys. presented in the 8th International Materials Technology Conference & Exhibition (IMTCE2012), Kuala Lumpur, Malaysia, July 9 – 12, 2012
10. T. Abubakar, M. Rahman, D. P. Dowling, J. Stokes and M.S.J.Hashmi, Characterisation of NiTi Shape Memory Alloy coating for tribological applications, presented in the International Conference of Smart Structure and Materials (SMART'09), Porto, Portugal, July 13 – 15, 2009.
11. T. Abubakar, M. Rahman, D. P. Dowling, J. Stokes and M.S.J.Hashmi, Mechanical Performance of the Annealed NiTi Shape Memory Alloy Coating onto 316L Stainless Bio-Steel, presented in the 5th International Conference on Diffusion in Solids and Liquids (DSL2009), Rome, Italy, June 24 – 26, 2009.
12. T. Abubakar, M. Rahman, D. P. Dowling, J. Stokes and M.S.J.Hashmi, Tribological Properties of Hard Coating Using A NiTi Shape Memory Alloy Interlayer, presented in the International Conference on Advances in Materials and Processing Technologies, AMPT2008, Manama, Bahrain, November 2 - 5, 2008.
13. T. Abubakar, M. Rahman, D. P. Dowling, J. Stokes and M.S.J.Hashmi, Adhesion Performance of TiN Coating with Amorphous NiTi Alloy Interlayer onto 316L Stainless Bio-Steel Deposited by the Sputtering Process, presented in the 3rd International Conference on Surfaces Coatings and Nanostructured Materials, Barcelona, Spain, October 22 - 24, 2008.
14. T. Abubakar, J.Stokes and M.S. J. Hashmi, Amorphous and Crystalline Nickel Titanium Shape Memory Alloy Coatings for Tribological Applications, presented in the Symposium Mechanical Engineering Research & Practice, Dublin City University, Dublin, Ireland, 28 May 2009.
15. T.Abubakar, J.Stokes and M.S. J. Hashmi, Deposition of duplex-doped DLC coating for orthopaedic implant surfaces using plasma enhanced chemical vapour deposition (PECVD), presented in the Surface engineering symposium & exposition workshop 2007, Dublin City University, Dublin, Ireland, 7 september 2007.
16. T.Abubakar, J.Stokes and M.S. J. Hashmi, Deposition of DLC coating for orthopaedic implant surfaces using plasma enhanced chemical vapour deposition (PECVD), presented in the One day workshop on Plasma Processes for Biomedical Applications, Dublin City University, Dublin, Ireland, 24 May 2007.
17. T.Abubakar, J.Stokes and M.S. J. Hashmi, Modification of implant surfaces for wear resistance applications, presented in the Christmas Symposium 2006, Dublin City University, Dublin, Ireland, 1 December 2006.