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Senior Lecturer

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Academic Qualification

- **Doctor of Engineering (DEng)** in Metallurgy and Ceramics Science, Tokyo Institute of Technology, Japan, 2013.
- **Master of Science (MSc)** in Materials Engineering, University of Science Malaysia, Malaysia, 2010.
- **Sarjana Teknik (ST)** in Materials Engineering, Institut Teknologi Bandung, Indonesia, 2005.

Brief Profile

After completing his undergraduate study from Materials Engineering ITB in 2005, Dr. Tedi Kurniawan was working as planning engineer at PT Indofood Bogasari Jakarta for about two years. In 2007, he was granted ASEAN University Network/Southeast-Asia Engineering Education Development Network (AUN/SEED-Net) Scholarship to pursue Master Degree in the field of Materials Engineering in USM Malaysia. Furthermore, with the scholarship from Japan International Cooperation Agency (JICA), he pursued his doctoral study in the Department of Metallurgy and Ceramics Science TIT Japan, starting from 2010 until 2013. In the same time, he also worked as research assistant for Energy-GCOE TIT. After completing his doctoral study, he joined Faculty of Mechanical Engineering UMP until present. His current research interest is related to materials engineering, such as high temperature oxidation of metallic materials and thin film coating for corrosion protection.

Working Experiences and Appointment

Working Experience

- 2013-now : **Senior Lecturer** at Faculty of Mechanical Engineering, University Malaysia Pahang.
- 2010-2013 : **Research Assistant** at Energy-GCOE, Tokyo Institute of Technology.
- 2005-2007 : **Planning Engineer** at PT Indofood Bogasari Tbk, Jakarta.
- 2005 : **Research Assistant** at Materials Engineering, Institut Teknologi Bandung.

Areas of Research Interest

1. **High-temperature physical chemistry:** High-temperature oxidation in dry and humid condition (boiler application); electrochemistry of solids at high temperature.
2. **Thin films technology:** Corrosion protection by thin film coating; thin films formations by sputtering, sol-gel technique, and thermal oxidation.
3. **Metals and alloys:** Mechanical and physical characterizations of metal alloys; alloying by vacuum arc melting.
4. **Advanced materials:** Synthesis of graphene and its application in metal coating

Appointment / Affiliation / Membership

1. CEO of Structural materials and degradation focus group, FKM UMP, 2018.
2. Coordinator of Graduate Employability, FKM UMP, 2018.
3. Instructor for Corrosion subject, Massive Open Online Course (MOOC) UMP, 2017-now.
4. Editor for Engineering Material subject, Open Course Ware (OCW) UMP, 2017.
5. Document and accreditation committee for master degree program, FKM UMP, 2015-2016
6. Committee of the Proceeding and Journal Publication, International Conference on Mechanical Engineering Research (ICMER), FKM, 2017.

7. Reviewer for Journal of Renewable and Sustainable Energy, International Journal of Hydrogen Energy, International Journal of Automotive and Mechanical Engineering, Journal of Mechanical Engineering and Sciences.
8. Professional Member, The Institute of Materials, Minerals and Mining (IoM3), UK.
9. Regular Member, International Association of Advanced Materials, 2016-now.
10. Regular Member, Materials Research Society, 2016.
11. Student Member, Japan Institute of Metal, 2012-2013.

Teaching Experience

Diploma Level

DMM 2632 Industrial Design
DMM 2533 Fluid Mechanics

Bachelor Level

BMM 1511 Engineering Mechanics Lab 1
BMM 1523 Engineering Materials
BMM 1533 Strength of Materials 1
BMM 2523 Thermodynamics 2
BMM 2521 Engineering Mechanics Lab 2

Master Level

MKM 1223 Advanced Materials Processing
MME 6144 Advanced Materials

Research Project / Grant

As Research Leader

1. Graphene dip-coating of light alloys for automotive application. Internal Grant, UMP. (2017-2019)
2. Pack cementation coating to improve the corrosion resistance of high chromium steels for boiler application. Fundamental Research Grant Scheme (FRGS), Ministry of Science, Technology and Innovation (MOSTI). (2014-2017)
3. ZrO₂ sol-gel coating for the corrosion protection of aluminum. Internal grant, UMP. (2014-2017)
4. High-temperature oxidation in dry and humid condition. Seed Money Grant, University Malaysia Pahang (2014-2015).
5. Hydrogen permeability of iron-oxides at 973 K under constant oxygen partial pressure. Young Researcher Grant, Energy-GCOE, TIT. (2011-2012)
6. Electromotive force (EMF) measurement of Pd-Fe alloys by CSZ-solid electrolyte. Young Researcher Grant, Energy-GCOE, TIT. (2010-2011)

As Research Member

1. Graphene Nanoplatelets for Epoxy Composites in Automotive Applications. Internal grant, UMP (2017-2019)
2. Fatigue behaviour of sugar palm fibre reinforced polylactic acid composites for automotive application. Internal grant, UMP (2017-2019)
3. Effects of biodegradable PLA on hydroxyapatite coating to improve adhesion properties on Co-Cr-Mo alloy. Internal grant, UMP (2017-2019)
4. Investigation of microstructure development and corrosion performance of friction stir welded light alloys. Internal grant UMP (2015-2017)
5. Development of Solid inhibitor for Hood Corrosion Protection in Automotive application. Internal grant, UMP. (2015-2017)
6. Characterization of biodegradable composites based on pineapple leaf fiber and tapioca bioplastic resin. Fundamental Research Scheme (FRGS), Ministry of Science, Technology and Innovation (MOSTI). (2014-2017)

Postgraduate Supervision

1. Synthesis of graphene via electrolysis process and its performance in corrosion protection of light alloys (Master by Research / Muhammad Azim Anwar Bin Noor Hisham). *On going*
2. Chromium coating on the corrosion resistance of ferritic-martensitic steel in dry and humid conditions. (Master by Research / Farah Alia Binti Fauzi). *Completed*

- The effects of Acrylonitrile Butadiene Styrene (ABS) and Polycarbonate (PC) ratio formulation to the mechanical properties of PC/ABS polymer. (Master by Course work / Mohd Hairy). *Completed*

Degree / Final Year Supervision

- Low cost and simple route of graphene exfoliation from pencil. (FYP / Asyraf Khafi). *On Going*.
- Corrosion properties of graphene coated magnesium in NaCl solution (FYP/ Jason Lam). *On Going*.
- Graphene coating on Aluminum by sol-gel dip coating process (FYP/ Keep Han). *On Going*.
- Dip Coating of ZrO₂ for the corrosion protection of mild steel (FYP/Muhammad Azim Anwar Bin Noor Hisham). *Completed*
- High temperature oxidation of T23 ferritic steel in steam condition. (FYP/Mohd Shahlan Halim Bin Mohd Yasin). *Completed*
- Low-Temperature Pack Cementation of T91 Steel. (FYP/Muhammad Husaini Bin Abdul). *Completed*
- Dry and steam oxidation of ferritic steel at 500°C-700°C (FYP/Leong Yong Hao). *Completed*.
- Corrosion resistance of aluminum coated by ZrO₂ via sol-gel technique (FYP/ Veanuga Ganapathy). *Completed*
- Caffeine as a natural inhibitor for corrosion protection of carbon steel (FYP/ Lim Pei Xuan). *Completed*
- Crevice corrosion of carbon steel in sea water condition (FYP/Megat Ahmad Danial). *Completed*
- Pack Cementation Coating of P11 Ferritic Steel (FYP / Yii Sing). *Completed*
- Effect of Heat Treatment Temperatures on the Microstructure and Mechanical Properties Changes of SS316 Stainless Steel (FYP / Muhamad Amirulshafiq Bin Mohammad Sabri). *Completed*
- Effect of deformation and heat treatment on the performance of Aluminium A141 as a sacrificial anode (FYP / Muhammad Fauzan Bin Abdullah). *Completed*
- Effect of Heat Treatment on the Corrosion Properties of Martensitic Steel (FYP / Mohamad Akram Bin Rozali). *Completed*
- Design and Fabrication of Apparatus for High-Temperature Oxidation (FYP/Mohd Razlie Bin Mohd). *Completed*

List of Publications: Papers & Proceedings

- V. Ganapathy, **T. Kurniawan**, H. Ayu, Y. P. Asmara, R. Daud, N. Prastomo, A. B. D. Nandiyanto. *Aluminum Alloy AA2024 Coated with ZrO₂ using a Sol-Gel-Assisted Dip-Coating Technique and Its Corrosion Performance*. Journal of Engineering Technology 13(6), p.1713-1721. (2018)
- YP Asmara, **T Kurniawan**. *Corrosion Prediction for Corrosion Rate of Carbon Steel in Oil and Gas Environment: A Review*. Indonesian Journal of Science and Technology 3(1), p.64-74 (2018).
- M Aziz, **T Kurniawan**, T Oda, T Kashiwagi. *Advanced power generation using biomass wastes from palm oil mills*. Applied Thermal Engineering. Vol.114, p.1378-1386 (2017).
- NS Manam, WSW Harun, DNA Shri, SAC Ghani, **T Kurniawan**, MH Ismail, MHI Ibrahim. Study of corrosion in biocompatible metals for implants: A review. Journal of Alloys and Compounds. 701, p.698–715 (2017).
- FF Alia, **T Kurniawan**, YP Asmara, MHB Ani, ABD Nandiyanto. High temperature oxidation in boiler environment of chromized steel. IOP Conference Series: Materials Science and Engineering 257 (1), 012086 (2017).
- MA Anwar, **T Kurniawan**, YP Asmara, WSW Harun, AN Oumar, ABD Nandyanto. Morphology evaluation of ZrO₂ dip coating on mild steel and its corrosion performance in NaOH solution. IOP Conference Series: Materials Science and Engineering 257 (1), 012087 (2017).
- FF Alia, **T Kurniawan**, MHB Ani, ABD Nandiyanto. The Effect of Temperature on the Chromizing Process for Ferritic-Martensitic Steel. Journal of Physics: Conference Series 914 (1), 012026 (2017).
- W Hissyam, AM Halil, **T Kurniawan**, M Ishak, T Ariga. Effect of Copper-based Fillers Composition On Spreading and Wetting Behaviour. IOP Conference Series: Materials Science and Engineering 238 (1), 012020 (2017).
- Asep B. D. Nandiyanto, Zulfan A. Putra, R. Andika, Muhammad R. Bilad, T. Kurniawan, R. Zulhijah, I. Hamidah. Porous activated carbon particles from rice straw waste and their adsorption properties. Journal of Engineering Science and Technology, Special Issue on ASSEEC 2016, p.1-11.(2017)
- Yonghao Leong, Farah Alia, **Tedi Kurniawan**. *High Temperature Oxidation Behavior of T91 Steel in Dry and Humid Condition*. Indonesian Journal of Science and Technology, Vol. 1(2), p.107-114 (2016).
- Asep Bayu Dani Nandiyanto, Heli Siti Halimatul Munawaroh, **Tedi Kurniawan**, Ahmad Mudzakir. *Influences of Temperature on the Conversion of Ammonium Tungstate Pentahydrate to Tungsten Oxide Particles with Controllable Sizes, Crystallinities, and Physical Properties*. Indonesian Journal of Chemistry, Vol. 16(2), p.124-129 (2016).
- Muhammad Aziz and **Tedi Kurniawan**. *Enhanced Utilization of Palm Oil Mill Wastes for Power Generation*. Chemical Engineering Transactions, Vol. 52, p.727-732 (2016) .

13. F. A. Fauzi, Y. S. Bin, **T. Kurniawan**, W.S.W. Harun. *Chromium Enrichment on P11 Stainless Steel by Pack Cementation*. MATEC Web Conferences, Vol.74, 00036 (2016).
14. **Tedi Kurniawan**, Farah Alia Binti Fauzi and Yuli Panca Asmara. *High-Temperature Oxidation of Fe-Cr Steels in Steam Condition – A Review*. Indonesian Journal of Science and Technology, Vol.1(1) p.107-114 (2016).
15. Y. P. Asmara, A. Geter, H.N.M. Zuki, Jamaludin, S.Januar, B.Dandi, **T. Kurniawan**, M.C. Ismail. *Corrosion Inhibition of Carbon Steel in Oil and Gas Environments*. International Journal of Advanced and Applied Sciences 3 (5), 88-91 (2016)
16. Ahmed N. Oumer, Idris Mat Sahat, Muhammad Ammar Nik Mu'tasim, and **Tedi Kurniawan**. *Numerical and Experimental Investigation on Tensile Properties of Natural-Sand Reinforced Polypropylene*. Advanced Materials Research, Vol. 1115, pp. 283-287 (2015).
17. **Tedi Kurniawan**. *Research Opportunities on High-Temperature Oxidation in Malaysia*. Invited Speaker in the 1st Asian high-temperature workshop. Tokyo Institute of Technology, Japan. 22 November (2014).
18. Asmara, Y.P., Juliawati, A., Jaafar, J., Azuar, K., Siregar, J.P., and **Kurniawan, T**. *Effects Pre-strain of Carbon Steel on Stress-Strain Diagram in CO₂ Environment with the Presence of H₂S*. International Journal of Material Science Innovations (IJMSI), 2 (3). pp. 52-58 (2014).
19. **Tedi Kurniawan**, Mitsutoshi Ueda, Kenichi Kawamura, Toshio Maruyama. *Phase Stability of Iron Oxides on Palladium-Iron Alloy at Elevated Temperature and its Application to High-Temperature Oxidation*. Materials Transactions, Vol.54 No.09, pp.143-150 (2013).
20. **Tedi Kurniawan**, Kuan Yew Cheong, Khairunisak Abdul Razak, Zainovia Lockman, Nuruddin Ahmad. *Oxidation of Sputtered Zr thin films on Si substrate*. Journal of Materials Science: Materials Electronics, Vol.22, pp.143–150 (2011).
21. **Tedi Kurniawan**, Yew Hoong Wong, Kuan Yew Cheong, Jeong Hyun Moon, Wook Bahng, Khairunnisak Abdul Razak, Zainovia Lockman, Hyeong Joon Kim, Nam Kyun Kim (2011). *Effects of post-oxidation annealing temperature on ZrO₂ thin film deposited on 4H-SiC substrate*. Materials Science in Semiconductor Processing. Vol.14, pp.13-17 (2011).
22. **K Tedi**, KY Cheong, Z Lockman. Effect of sputtering time on physical and electrical properties of ZrOx thin film on Si. Microelectronics International Vol. 8(3), pp.7-11 (2011).

List of Conferences

1. **T Kurniawan**. *Pack Cementation of T91 Steel for Boiler Application*. **Invited Speaker** at The 3rd Annual Applied Science and Engineering Conference (AASEC 2018), 18 April 2018, Bandung, Indonesia (2018).
2. FA Fauzi, **T Kurniawan**, YP Asmara, MHB Ani. *The Effect of Temperature On The Chromizing Process For Ferritic Martensitic Steel*. The 8th International Conference in Mechanical Engineering 2017 (ICME '17). 22-23 July 2017, Langkawi, Malaysia (2017).
3. FA Fauzi, **T Kurniawan**, YP Asmara, MHB Ani, Muhammad Aziz. *Oxidation Behavior of Pack Cemented T91 Steel in Steam Condition*. 1st International Conference on Advanced Energy Materials (AEM2016), 12-14 September 2016, Guilford, United Kingdom (2016).
4. Farah Alia Fauzi and **Tedi Kurniawan**. *High Temperature Oxidation in Boiler Environment of Chromized Steel*. The 3rd International Conference of Global Network for Innovative Technology (IGNITE). Penang Malaysia, 25-27 January (2016).
5. **Tedi Kurniawan**, Mitsutoshi Ueda, Kenichi Kawamura, Toshio Maruyama. *The Equilibrium Oxygen Partial Pressure between Palladium-Iron Alloy and Iron-Oxide at 973 K to 1123 K*. Japan Institute of Metal Annual Meeting 2012. Matsuyama, Ehime, Japan. September 17-19 (2012).
6. **Tedi Kurniawan**, Mitsutoshi Ueda, Kenichi Kawamura, Toshio Maruyama. *Phase Stability and Thickness Estimation of Iron-Oxides on Palladium-Iron Alloys*. The 5th Energy-GCOE CDP Forum - Future Social Standing of Energy Science Doctors. Meguro, Tokyo. Japan. September 6 (2012).
7. **Tedi Kurniawan**, Mitsutoshi Ueda, Kenichi Kawamura, Toshio Maruyama. *Formation of Wustite in High-Temperature Oxidation of Pd-Fe Alloys at 1073 K*. The 4th Energy-GCOE CDP Forum. Meguro, Tokyo, Japan. March 5 (2012).
8. **Tedi Kurniawan**, Mitsutoshi Ueda, Kenichi Kawamura, Toshio Maruyama. *Emf Measurement of Pd-Fe Alloys at 973 K to 1123 K with CSZ Solid Electrolyte*. The 4th International Forum on Multidisciplinary Education and Research for Energy Science. Honolulu, Hawaii, USA. December 17-23 (2011). The same paper also presented in The Joint 4th AUN/SEED-Net Regional Conference 2011. Olongapo City, Zambales, Philippines. October 27-28 (2011).
9. **Tedi Kurniawan**, Mitsutoshi Ueda, Kenichi Kawamura, Toshio Maruyama. *Activity measurement of Fe in Pd-Fe Alloys at the temperature range from 973 K to 1123 K*. Gordon Research Conference in High Temperature Corrosion. New London, New Hampshire, USA. July 24-29 (2011).
10. **Tedi Kurniawan**, Mitsutoshi Ueda, Kenichi Kawamura, Toshio Maruyama. *Hydrogen Permeability of Iron Oxides (FeO, Fe₃O₄, Fe₂O₃) at pO₂ Constant at 973 K*. The third International Forum on

Multidisciplinary Education and Research for Energy Science. Ishigaki, Okinawa, Japan. December 10-13 (2010).

11. **Tedi Kurniawan**, Cheong Kuan Yew, Khairunnisak Abdul Razak, Zainovia Lockman, Ahmad Nuruddin. *Effect of Sputtering Time on Physical and Electrical Properties of ZrO₂ Thin Films*. The 1st AUNSEED/Net Regional Conference on Materials. Pulau Penang, Malaysia. February 16-17 (2009).
12. **Tedi Kurniawan**, Cheong Kuan Yew, Khairunnisak Abdul Razak, Zainovia Lockman, Ahmad Nuruddin. *Physical characterization of ZrO₂ thin films formed by thermal oxidation of sputtered Zr on Si substrate*. Thin Films 2008. "The 4th International Conference in Technological Advances of Thin Films and Surface Coating. Singapore, July 13-16 (2008).

Awards / Achievements

1. "Cendekia Bintara 2017 award" for Publication Category, UMP, Malaysia, 28 March 2018.
2. Silver medal, Citrex 2018 UMP. *Synthesis of graphene from pencil by electrolysis*. 7-8 February 2018, UMP Gambang, Malaysia.
3. Bronze medal, Citex 2017 UMP. *Caffeine as natural corrosion inhibitor for carbon steel*. 15-16 March 2017, UMP Gambang, Pahang, Malaysia.
4. "Teaching Excellence" for subjects Engineering Materials, Thermodynamics 2, Engineering Mechanics Lab 1, Engineering Mechanics Lab 2, and Advanced Materials Processing. (2014-2016).
5. "Best Collaboration Award". The 4th International Forum on Multidisciplinary Education and Research for Energy Science. Honolulu, Hawaii, USA. December 17-23, 2011.
6. Doctoral Scholarship – Japan International Cooperation Agency (JICA), April 2010 –March 2013.
7. Master Scholarship – ASEAN University Network / Southeast-Asia Engineering Education Development Network (AUN/SEED-Net), July 2007 – June 2009.