



Inaugural  
Federation of Engineering Institutions  
of Asia and the Pacific (FEIAP)  
Convention 2011

*2 – 7 October 2011*

*Furama RiverFront Hotel, Singapore*

*Guest-of-Honour  
Mr. Gan Kim Yong  
Minister for Health*



Incorporating

- FEIAP International Conference:  
“Engineering Education & Accreditation”
- FEIAP Workgroup & General Assembly
- Engineering Accreditation Workshop:  
Developing Sustainable Programme Assessment Process

12:15-13:30	Networking Lunch (Jupiter I, II & III)			
13:30-15:00	<b>Session 2 – Developing Competency</b> <b>Chairman and Moderator: Er. Prof. Chew Yong Tian, Past President, IES</b>			
13:30-13:55	Keynote Paper 4 (S2-1)	Emeritus Prof. Alan Bradley	Accreditation Consultant, Engineers Australia, Australia	Stage 1 Competency Standards – Driving Engineering Education Design
13:55-14:20	Keynote Paper 5 (S2-2)	Prof. Chan Eng Soon	Dean, Faculty of Engineering, National University of Singapore	Transforming Engineering Education Through a Design Centric Curriculum
14:20-14:45	Keynote Paper 6 (S2-3)	Prof. Janie M. Fouke (presented by Prof. Cheng Tee Hiang)	Dean, College of Engineering, Nanyang Technological University, Singapore	Re-engineering Engineering Education
14:45-15:00	Presentation of Tokens of Appreciation to Speakers			
	Q&A Session			
15:00-16:00	<b>Session 3 – Conceive-Design-Implement-Operate (CDIO)</b> <b>Chairman and Moderator: Prof. Er Meng Hwa, Vice President, Nanyang Technological University</b>			
	Speaker 1 (S3-1)	Ms. Pee Suat Hoon	Director, Department of Educational Development, Singapore Polytechnic	CDIO @ Singapore Polytechnic
	Speaker 2 (S3-2)	Ms. Kwek Siew Wee	Manager/Academic of School of Engineering (Electronics), Nanyang Polytechnic	Developing Industry-ready Professionals: NYP Teaching Factory and CDIO
	Speaker 3 (S3-3)	Mr. Mah Wee Beng	Deputy Principal, Ngee Ann Polytechnic	Engineering Education: NP's Approach to Staying Relevant & Responsive
	Presentation of Tokens of Appreciation to Speakers			
	Q&A Session			
16:00-16:30	Networking Tea Break			
16:30-17:30	<b>Session 4 – Engineering Accreditation Practices in this region</b> <b>Chairman and Moderator: Er. Dr. Chew Soon Hoe, Conference Committee Chairman, IES</b>			
	Speaker 1 (S4-1)	Prof. Heng Meng Ho	Board of Engineers Cambodia	Engineering & Technology Education and Accreditation: The Case of Cambodia
	Speaker 2 (S4-2)	Prof. Rashmi Jain	Associate Professor, Department of Industrial and Systems Engineering, National University of Singapore	Coming of Age of Systems Engineering Education: Accreditation Process and Preparedness of the Academic Programs
	Speaker 3 (S4-3)	Ir. Dr. Tan Chee Fai	Department of Mechanical Engineering, Universiti Teknikal Malaysia, Melaka	Engineering Education and Accreditation Scenario in Malaysia
	Q&A Session			
	Presentation of Tokens of Appreciation to Speakers			
17:30	End of Day 1			

# Abstracts

## Session 1 – Quality Assurance

	Author(s)	Title	Page
S1-1:	Phillip E. Borrowman	Improving the Quality of Engineering Education Through Accreditation Activities	19
S1-2:	Remaud Bernard, Sanchez Teresa and Arditti Jean-Claude	Quality Assurance In Engineering Education: State of the Art in France and Europe	20
S1-3:	Lee Yee Cheong	Engineering & Engineers in the 21st Century	23

## Session 2 – Developing Competency

S2-1:	Alan Bradley and Peter Hoffman	Stage 1 Competency Standards – Driving Engineering Education Design	25
S2-2:	Chan Eng Soon and Lim Seh Chun	Transforming Engineering Education Through a Design Centric Curriculum	27
S2-3:	Janie M. Fouke	Re-engineering Engineering Education	29

## Session 3 – Conceive-Design-Implement-Operate (CDIO)

S3-1:	Pee Suat Hoon	CDIO @ Singapore Polytechnic	32
S3-2:	Kwek Siew Wee	Developing Industry-ready Professionals: NYP Teaching Factory and CDIO	33
S3-3:	Mah Wee Beng	Engineering Education: NP's Approach to Staying Relevant & Responsive	34

## Session 4 – Engineering Accreditation Practices in this Region

S4-1:	Heng Meng Ho and Soveacha Ros	Engineering & Technology Education and Accreditation: The Case of Cambodia	35
S4-2:	Rashmi Jain	Coming of Age of Systems Engineering Education: Accreditation Process and Preparedness of the Academic Programs	37
S4-3:	Tan Chee Fai, Ranjit Singh Sarban Singh, Ong Siaw Thien, and Ngeow Yen Wan	Engineering Education and Accreditation Scenario in Malaysia	39

## Session 5 – New Frontier

S5-1:	Chong Tow Chong	Engineering's Second Wind: Nurturing Engineers with a Design Edge	41
S5-2:	Yen Jia-Yush, Liu Mandy, Yang Yeong-Bin, and John Li Chien-Chung	An Introduction to the FEIAP Engineering Education Guideline	42
S5-3:	Mustafizur Rahman	Engineering Education for Sustainable Development	44

## Session 6 – Engineering Education and Teaching Methodology

S6-1:	Chin Hoong-Chor and Chew Soon-Hoe	Making Students Learn By Themselves and About Themselves: An Innovative Approach to Training Engineers	46
S6-2:	Edicio Faller and Albert B. Jubilo	Improve Teaching-Learning Strategies - Case study of the Ateneo De Davao University	48
S6-3:	Qaiser H. Malik, Matthew J. Koehler, Punya Mishra, Neeraj Buch, and Michael Shanblatt	Does a Cornerstone Design Experience Affect Changes in Freshman Attitudes?	50
S6-4:	Zheng Guoying	Project Based Learning for Future Engineers in Aerospace – The ST Aerospace Experience	53

#### **S4-3:**

### **ACCREDITATION ENGINEERING EDUCATION SCENARIO AND FUTURE OF ENGINEERING EDUCATION IN MALAYSIA**

**TAN Chee Fai** (C.F. TAN), The Institution of Engineers, Malaysia (IEM), Universiti Teknikal Malaysia Melaka (UTeM),

**Ranjit Singh Sarban Singh** (S. S. S. Ranjit), The Institution of Engineers, Malaysia (IEM), Universiti Teknikal Malaysia Melaka (UTeM),

**ONG Siaw Thien**, Universiti Teknikal Malaysia Melaka (UTeM),

**NGEOW Yen Wan**, The Institution of Engineers, Malaysia (IEM), Malaysia Rubber Research Board

**Email:** [cheefai@utem.edu.my](mailto:cheefai@utem.edu.my)

#### **ABSTRACT**

Engineering education in Malaysia is a strong and vibrant enterprise. Malaysia government is projecting to produce 222,000 engineering graduates in the next 9 years. This number of engineers is needed to ensure the development industries, infrastructures and general well-being of Malaysia are carried out as planned. However, since Malaysia has engineers in various fields, engineers have provided the driving forces behind high technology services and products to enhance the Malaysia economy growth locally and internationally. It is also cited that there are 33 accredited engineering programmes in Malaysia universities and colleges. Engineering degree is the common degree entry to the engineering profession nowadays, such as civil engineering, electrical engineering, electronics engineering and mechanical engineering. The Malaysia engineering degree requires completion of four years full time study. For an engineering degree programme to be recognize, all the engineering degrees in Malaysia are governed by Engineering Accreditation Council (EAC). EAC ensure all the engineering degree programmes that are offered by Malaysian universities are subjected to the minimum academic requirements for registration as a graduate engineer with the Board of Engineers Malaysia (BEM). BEM is representing Malaysia in Washington Accord since 2009, engineering education in Malaysia took on a broader international aspect and agreed to achieve equivalent standard with the other 14 signatories' countries. Due to the upcoming challenges of the future, it is ideated that Malaysia engineers must progress working hard with all the necessary technical competencies in engineering science. This role is very important so that they will be flexible enough to be involved in multidisciplinary engineering tasks in Malaysia and around the world.

Globalisation is a trend that affects humanities, cultures, traditions and history of a country. Globalisation is defined as "the flow of people, culture, ideas, values, knowledge, technology, and economy across borders facilitating a more interconnected and interdependent world". Engineering graduates are facing fierce challenges and competition not only locally but also internationally. Due to the global challenges and competition, local engineering graduates need to equip themselves with flexibility, ethics, professionalism, knowledge and skill in facing the global challenges. Government, educational institutions and industry plays an important role to upgrade the quality of local engineering education. The modern engineering profession deals constantly with uncertainty, incomplete data and competing (often conflicting) demands from clients, governments, environmental groups and the public. It requires technical competent and professionalism skill, as well as to be exposed to the global scenarios, current trend and future requirements. Whilst trying to incorporate more "humanity" skill into their knowledge base and professional practice, today's engineers must also cope with continual technological and organizational changes in the workplace. In addition they must cope with the commercial realities of industrial practice in the modern world, as well as the legal consequences of every professional decision they make. The challenge for engineering education in Malaysia is to improve the current engineering education system so that the Malaysia engineering graduates are recognized

internationally. Nevertheless, engineering education in Malaysia is constantly reviewed together with the professional members from the industries and education departmental. This study is expected to provide the current scenario of engineering education which later will foresee effect and the future design of accredited engineering curriculum in Malaysia. This aim of this paper is to describe the modelled current scenario of accredited engineering education and the accreditation process on future engineering education in Malaysia.

**KEYWORDS:** accreditation, engineering education

**AUTHOR'S BIODATA**

Ir. Dr. C.F. Tan graduated in Mechanical Engineering with honours, Master of Science in Manufacturing Systems Engineering from Universiti Putra Malaysia and PhD in Industrial Design Engineering from Eindhoven University of Technology, the Netherlands. He is a Senior Lecturer at Department of Design & Innovation, Faculty of Mechanical Engineering, Universiti Teknikal Malaysia Melaka since 2003. He actively involved in teaching and learning, consultation as well as research and development activities. He is a member of Institution of Engineers, Malaysia and registered Professional Engineer with Board of Engineers, Malaysia. In IEM, currently he serves as member in Standing Committee on Examination and Training, Standing Committee on Qualifications and Admissions, Engineering Education Technical Committee, and Mechanical Engineering Technical Committee. His research interests cover the aspects of advanced mechanical engineering design, industrial design engineering, smart system, multidisciplinary design and human-technology interaction design.

