

**WP and EA**

Siti Hawa Hamzah  
Associate Director (Civil Engineering), Accreditation Department,  
Board of Engineers Malaysia (BEM), Malaysia

and

Liew Chia Pao  
Associate Director (Electronic Engineering), Engineering Accreditation Department,  
Board of Engineers Malaysia (BEM), Malaysia

**Abstract**

This session discusses the design and assessment of learning outcomes with complex engineering problems (WP) and complex engineering activities (EA). The distinctive roles of engineers, technologists and technicians are defined by the range of problem-solving and engineering activities. The aims are to discuss the characteristics of WP and EA according to the Washington Accord (WA) and how WP and EA can be implemented in engineering curriculum. Their characteristics in conjunction with the IEA's 12 Graduate Attributes (GAs) must be aligned with the learning outcomes and learning and teaching methods, as well as assessed and analyzed. Identification, adaptation, planning, and execution toward the attainment of the 12 GAs must be evident as true attainment. Continuous quality improvements are implemented toward improving the learning process and students' achievement of the learning outcomes. Examples of actual implementation of WP and EA that take into account the Knowledge Profile (WK) of the WA will be shared with participants.



Ir. Dr. Siti Hawa Hamzah's academic qualifications: BSCE & Cert. of Education from University of Miami, USA; MSCE from University of Kentucky, USA; and PhD from UKM Malaysia. Professionally, a licensed professional engineer with a practicing certificate, Fellow of The Institution of Engineers (IEM) Malaysia, Hon MAFEO ASEAN engineer, life member of Majlis Rekabentuk Malaysia, and life member of Persatuan Siswazah Wanita Malaysia. Currently, an associate director (Civil Engineering) with the Accreditation Department, Board of Engineers Malaysia (BEM) since 2016, assumed a former role as the associate director (Structural Engineering) from 2014 and a Washington Accord mentor to the Board of Accreditation for Engineering and Technical Education (BAETE) Bangladesh since 2016. She has more than 33 years of teaching and academic experience, majoring in structural engineering; supervised and examined more than 110 postgraduate students and more than 450 undergraduate students; completed 21 research projects;

coauthored and published 11 books in structures; published more than 165 technical papers in journals and proceedings; and published videos (YouTube) on engineering accreditation. She has been involved with Dewan Bahasa & Pustaka in publications of more than five textbooks and reference books for technical schools, publication of Malaysian Standard with SIRIM Berhad & CIDB, Editorial Advisory Board to national and international journals and proceedings, reviewed books, journal publications, technical articles, and research proposals. She has also conducted consultancy work. She has acquired comprehensive expertise and talent in undergraduate and postgraduate curriculum development and reviews, moderate examinations, mentoring young lecturers and accreditation (EAC & ETAC) panels, and advising and organizing academic activities such as conferences and workshops. She has been the academic administrator for more than 15 years. She has been appointed as an external examiner, assessor, and OBE adviser and trainer. She is an expert and resource on engineering accreditation matters. She has been involved in at least 120 engineering education accreditation evaluations. Synonymously, at IEM, she has served in all Standing Committees, served as a council member and executive council member, served the BEM in the T&E Committee, conducted professional interviews, provided trainings, and given lectures related to the profession. Additionally, she has been active in community services. She was given the IEM Lady Engineer Award in 2007 and appointed as an honorary member to AFEO in 2008. She has received more than 20 research accolades at both international and national invention, innovation, and design competitions. Lastly, she is a triple award recipient for UiTM excellent services and in 2017 retired from the Faculty of Civil Engineering, Universiti Teknologi MARA Shah Alam Malaysia, as a professor.



Ir. Liew Chia Pao is a principal lecturer in the Faculty of Engineering and Technology, Tunku Abdul Rahman University College (TAR UC), Malaysia. Professionally, he is a licensed professional engineer with a practicing certificate from the Board of Engineers Malaysia and a corporate member of the Institution of Engineers Malaysia. Currently, he is an associate director (Electronic Engineering) of the Engineering Accreditation Department, Board of Engineers Malaysia (BEM). He has over 9 years of teaching and academic experience, managing engineering programs; has accreditation evaluator experience in more than 60 programs; and has published accreditation videos on YouTube and some technical papers. He has over 11 years of experience as an R&D engineer and project manager in powerline communication. He is editor of the 2017 Engineering Accreditation Council Accreditation Manual. He was appointed by the Ministry of Education, Malaysia as an evaluator to assess the engineering program in Spain in 2016. He has delivered a number of workshops and

talks on accreditation, outcome-based education, and complex engineering problem-solving for the Engineering Accreditation Council Malaysia, many Malaysian universities, and, most recently, Conference of the ASEAN Federation of Engineering Organizations (CAFEO) in Singapore in November 2018. He has worked as an R&D engineer and project manager in powerline communication with OCM-Web and as a consultant in the industrial and electronics sector with Frost & Sullivan. His research areas are complex engineering problem-solving and engineering program outcome assessment. He is the external examiner of the Bachelor of Electrical and Electronic Engineering degree program at Xiamen University Malaysia Campus and KDU University College, Malaysia. He obtained his diploma from TAR UC (1996) and a Master of Science from University of Hertfordshire, UK (1998), and he passed the Engineering Council UK examinations.