

IMPLEMENTATION OF **OUTCOME BASED EDUCATION (OBE)**

All bachelor engineering programmes at the Universiti Sains Malaysia (USM) have adopted the Outcome Based Education (OBE) since the academic year of 2006/2007.

The OBE emphasises that the professional attributes of the graduates satisfy the current and future needs of the country and global market in general.

In general, OBE is a method of curriculum design, teaching and learning that focuses on what students can actually do after they are taught and also on the graduates of the programmes upon graduation and three to five years after they have graduated.

Following the OBE, the Programme Educational Objectives (PEO) of each programme offered at the Engineering Schools are developed through interviews and surveys from the stakeholders including industries, government, parents, students, alumni and the university lecturers. This signifies that the programmes offered in USM are relevant to the current needs of industries and society and for the preparation of high quality future talents.

With the agreed PEO, the curricular structure of each programme is planned accordingly to ensure that USM graduates possess the quality attributes as suggested by the Engineering Accreditation Council (EAC) and Board of Engineer Malaysia (BEM).

In line with the OBE system adopted by all engineering schools in USM, the School of Electrical and Electronic Engineering (SEEE) have the following PEOs for the three undergraduate programmes offered by the school:

Programme Educational Objectives (PEOs)



**Bachelor of
Electrical
Engineering**
with Honours

1 Graduates who are employed in the Electrical Engineering related fields.



**Bachelor of
Electronic
Engineering**
with Honours

2 Graduates who are employed in the Electronic Engineering related fields.



**Bachelor of
Mechatronic
Engineering**
with Honours

3 Graduates who are employed in the Mechatronic Engineering related fields.

2

Graduates who are innovative, pursue continuous career development, and participate in society related activities.

3

Graduates who have leadership qualities, ethical values and awareness in sustainability issues.

Also under the OBE, each programme should have Programme Outcomes (POs) that describe what students are expected to know and be able to perform or attain upon graduation.

SEEE is adopting the POs as stated by Washington Accord and Engineering Accreditation Council in its 2012 EAC Manual which are as follows:

Programme Outcomes (POs)

Engineering Knowledge

PO1

Ability to apply knowledge of mathematics, natural science, computing and engineering fundamentals, and an engineering specialization as specified in WK1 to WK4 respectively to develop solutions to complex engineering problems.

PO2 Problem Analysis

Ability to identify, formulate, research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences with holistic considerations for sustainable development (WK1 to WK4).

Design/Development of Solutions

PO3

Ability to design creative solutions for complex engineering problems and design systems, components or processes to meet identified needs with appropriate consideration for public health and safety, whole-life cost, net zero carbon as well as resource, cultural, societal, and environmental considerations as required (WK5).

PO4 Investigation

Ability to conduct investigation of complex engineering problems using research methods including research-based knowledge, including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions (WK8).

Tool Usage

PO5

Ability to create, select and apply, and recognize limitation of appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering problems (WK2 and WK6).

PO6 The Engineer and the World

Ability to analyze and evaluate sustainable development impacts to society, the economy, sustainability, health and safety, legal frameworks, and the environment, in solving complex engineering problems (WK1, WK5, and WK7).

Ethics

PO7

Ability to apply ethical principles and commit to professional ethics and norms of engineering practice and adhere to relevant national and international laws. Demonstrate an understanding of the need for diversity and inclusion (WK9).

PO8 Individual and Collaborative Teamwork

Ability to function effectively as an individual, and as a member or leader in diverse and inclusive teams and in multidisciplinary, face-to-face, remote and distributed settings (WK9).

Communication

PO9

Ability to communicate effectively and inclusively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, taking into account cultural, language, and learning differences.

PO10 Project Management and Finance

Ability to apply knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, and to manage projects in multidisciplinary environments.

Life Long Learning

PO11

Ability to recognize the need for, and have the preparation and ability for

- i. independent and life-long learning
- ii. adaptability to new and emerging technologies and
- iii. critical thinking in the broadest context of technological change (WK8).