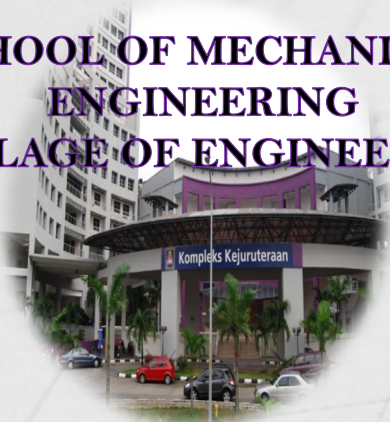




UNIVERSITI  
TEKNOLOGI  
MARA

**SCHOOL OF MECHANICAL  
ENGINEERING  
COLLEGE OF ENGINEERING**



**BACHELOR OF ENGINEERING  
(HONOURS) MECHANICAL  
EM220/CEEM220**

**BACHELOR OF MECHANICAL  
ENGINEERING WITH HONOURS  
CEEM222**

**OUTCOME BASED  
EDUCATION**



Key Performance Indicator (KPI) for the PO attainment: 75% out of total students should achieve a minimum of 50% marks for each PO at the end of the programme.

**OUTCOME-BASED EDUCATION (OBE)**

OBE is a methodology of curriculum design and teaching that focuses on what students can actually do after they are taught. OBE focuses on these key questions as to:

- a) What should the students learn?
- b) What is the motivation for the students to learn it?
- c) How can the academic institution and its resources help students learn it?
- d) How will it be determined what the students have learned (assessment)?

Thus, the OBE's instructional planning process is a reverse of that associated with traditional educational planning. The desired outcome is determined first and the curriculum, instructional materials and assessments are designed around to support and facilitate the intended outcome (Spady 1988; 1993). All curriculum and teaching decisions are made based on how best to facilitate the desired final outcome.

**PROGRAM EDUCATIONAL OBJECTIVES (PEOs)**

PEOs are specific attributes expected in graduate within 3 to 5 years after graduation during their career and professional life. These attributes are consistent with the mission and vision of Institute of Higher Learning (IHL).

**PEO**

**PEO1** - Engineers adapt and transform the acquired knowledge in public and private sectors with respect to related professional fields.

(KPI: 70% employers' satisfaction on alumni career progression; 25% of alumni holding leadership position having authority and subordinates)

**PEO2** - Engineers are expert and competent in their professional fields.

(KPI: 5% of alumni are registered professional engineers or engineering experts or equivalent after five (5) years of employment; 70% of alumni work in related engineering job functions)

**PEO3** - Engineers are globally competitive and professionally employed in multinational/international organizations.

(KPI: 30% of alumni work in multinational/ international companies or equivalent international levels)

**PEO4** - Engineers practice ethical and professional values in their respective fields.

(KPI: 90% of stakeholders/respondents are satisfied with alumni ethical and professional values; 90% of the alumni have received salary increment when time due)





# PROGRAMME OUTCOMES (PO)

Statements that describe what students are expected to know and be able to perform or attain upon graduation. These relate to the skills, knowledge and behaviour that students acquire through the programme. Key Performance Indicator (KPI) for the PO attainment: 75% out of total students should achieve a minimum of 50% marks for each PO at the end of the programme.

- PO1**- Able to apply knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization as specified in WK1 to WK4 respectively to the solution of complex engineering problems.
- PO2** - Able to identify, formulate, research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences. (WK1 to WK4)
- PO3** - Able to design solutions for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations. (WK5)
- PO4** - Able to conduct investigations of complex problems using research-based knowledge (WK8) and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.
- PO5** - Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering problems, with an understanding of the limitations. (WK6)

- PO6** - Able to apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solutions to complex engineering problems. (WK7)
- PO7** - Able to understand and evaluate the sustainability and impact of professional engineering work in the solution of complex engineering problems in societal and environmental contexts. (WK7)
- PO8** - Able to apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice. (WK7)
- PO9** - Able to function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.
- PO10** - Able to communicate effectively 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, and give and receive clear instructions.
- PO11** - Able to demonstrate 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, to manage projects and in multidisciplinary environments.
- PO12** - Able to recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

# COURSE OUTCOMES (CO)

Students attributes/abilities by the end of the course

# MAPPING OF PEO-PLO- 9 MOHE LOD

PEO	12 PO (EAC REQUIREMENTS)	9 LOD (MOHE)
(PEO1)	PO1	LOD1 - Knowledge in specific area (Cognitive)
	PO2	LOD3 - Thinking and Scientific Skills (Cognitive)
	PO4	LOD3 - Thinking and Scientific Skills (Cognitive)
(PEO2)	PO3	LOD3 - Thinking and Scientific Skills (Cognitive)
	PO4	LOD3 - Thinking and Scientific Skills (Cognitive)
	PO5	LOD2 - Practical Skills (Psychomotor)
	PO7	LOD6 - Values, Ethics, Moral and Professionalism (Affective)
	PO8	LOD6 - Values, Ethics, Moral and Professionalism (Affective)
(PEO3)	PO11	LOD8 - Management and Entrepreneurship (Cognitive)
	PO2	LOD3 - Thinking and Scientific Skills (Cognitive)
	PO9	LOD9 - Leadership Skills (Affective)
(PEO4)	PO12	LOD7 - Information Management and Life-Long Learning (Affective)
	PO6	LOD5 - Social Skills, Teamwork and Responsibilities (Affective)
	PO8	LOD6 - Values, Ethics, Moral and Professionalism (Affective)
	PO10	LOD4 - Communication Skills (Affective)

Prepared by:  
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