

# SUSTAINABILITY COURSES OFFERED IN UNIVERSITI TEKNIKAL MALAYSIA MELAKA

## FACULTY OF ELECTRONICS AND COMPUTER TECHNOLOGY AND ENGINEERING (FTKEK)

Course Code	Course Name	Programme
DERN	Safety and Health in Engineering	Diploma in Electronics Engineering

SAFETY & HEALTH IN ENGINEERING		
DERN1322	SEMESTER 3	SESSION 2024/2025



**TEACHING PLAN**  
**FACULTY OF ELECTRONICS AND COMPUTER TECHNOLOGY AND ENGINEERING**  
**UNIVERSITI TEKNIKAL MALAYSIA MELAKA**

### 1.0 : DESCRIPTION

LO	Description
LO01	Demonstrate understanding of professional ethics, responsibilities and norms of technician practice related to occupational health and safety. [PO8, DK7, LOD-C5]
LO02	Evaluate the sustainability and impact of engineering technician work in the solution of well-defined engineering problems in societal and environmental context. [PO7, DK7, DP1 DP2 DP5, LOD-C5]
LO03	Demonstrate knowledge of the multidisciplinary issues and the consequent responsibilities relevant to engineering technician practice and solutions to well-defined engineering problems. [PO6, DK7, DP1 DP2 DP5, LOD-C4A]

### 2.0 : SYNOPSIS

THE COURSE BEGINS WITH AN INTRODUCTION TO THE OCCUPATIONAL SAFETY AND HEALTH IN MALAYSIA, INCLUDING DOSH ROLES, OSH ACT 1994, AND THE LEGAL OBLIGATIONS OF EMPLOYERS AND EMPLOYEES. NEXT, STUDENTS WILL EXPLORE ENGINEERING ETHICS AND SAFETY PRACTICES, FOCUSING ON PROFESSIONAL CONDUCT, REPORTING UNSAFE PRACTICES, AND EFFECTIVE SAFETY COMMUNICATION. STUDENTS WILL THEN LEARN ABOUT SAFETY AND HEALTH IN ELECTRONICS ENGINEERING, COVERING ELECTRICAL SAFETY, FIRE PREVENTION, HAZARDOUS MATERIALS HANDLING, PPE USAGE, ERGONOMIC WORKPLACE DESIGN, AND HYGIENE PRACTICES. FINALLY, THE COURSE ADDRESSES ENVIRONMENTAL IMPACT AND SUSTAINABILITY IN ELECTRONICS ENGINEERING, DISCUSSING SDGS, LIFE CYCLE ASSESSMENT, E-WASTE DISPOSAL, AND COMPLIANCE WITH MALAYSIAN ENVIRONMENTAL REGULATIONS.

### 3.0 : PRE-REQUISITE

TIADA REKOD

### 4.0 : MAIN TEXT BOOK

"OCCUPATIONAL SAFETY AND HEALTH ACT 1994 (ACT 514) REGULATIONS & ORDERS", INTERNATIONAL LAW BOOK SERVICES, 2023

### 5.0 : REFERENCES

DAVID L. GOETSCH, "OCCUPATIONAL SAFETY AND HEALTH FOR TECHNOLOGISTS, ENGINEERS, AND MANAGERS", 10TH EDITION, PEARSON EDUCATION, 2022. PEDRO M. AREZES, "OCCUPATIONAL AND ENVIRONMENTAL SAFETY AND HEALTH IIP". SPRINGER, 2022. JOHN D. SURMA, "OCCUPATIONAL SAFETY AND HEALTH LAW HANDBOOK", 4TH EDITION, BARNES PRESS, 2023. DAVID DE LA FUENTE, "ORGANIZATIONAL ENGINEERING IN INDUSTRY 4.0", SPRINGER, 2021. CHARLES D. REESE, "HANDBOOK OF SAFETY AND HEALTH FOR THE SERVICE INDUSTRY", CRC PRESS, 2018.

## FACULTY OF TECHNOLOGY AND MECHANICAL ENGINEERING (FTKM)

Course Code	Course Name	Programme
BMKC	Sustainable & Environment	Bachelor of Mechanical Engineering

 <p style="text-align: center;"> <b>PERANCANGAN MENGAJAR</b>  <b>UNIVERSITI TEKNIKAL MALAYSIA MELAKA</b>  <b>FAKULTI TEKNOLOGI &amp; KEJURUTERAAN MEKANIKAL</b> </p>		
<b>SUSTAINABILITY &amp; ENVIRONMENT</b>		
BMKC 3042	SEMESTER 1	SESI 2024/2025

### 1.0 OBJECTIVES

The objective of this course is to introduce the environmental and sustainability concept as well as its application in industry. This will enhance the knowledge and awareness of the student to ensure the manufacturing process does not neglect the safety, economic, sustainability and environmental aspects.

### 2.0 LEARNING OUTCOMES

At the end of this course, students should be able to:

- PO6 Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and consequent responsibilities relevant to professional engineering practice. **(The Engineer and Society)**
- PO7 Understand and evaluate the sustainability and impact of professional engineering work in the solutions of complex engineering problems in societal and environmental context. **(Environment and Sustainability)**
- PO8 Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice. **(Ethics)**
- LO1 Explain the impact of pollution and climate changes towards the environment. **(PO6)**
- LO2 Apply the concept of sustainable development in engineering design, manufacturing and technologies abide with the current national laws, regulations and policies **(PO8)**, and
- LO3 Demonstrate sustainability in solving complex engineering problems to achieve Sustainable Development Goals (SDGs). **(PO7)**

### 3.0 SYNOPSIS

Moving towards developed country and high-income nation in 2025, industrial activities contribute significant impact to the economic growth and environment. To ensure the growth able to meet the need for sustainable development, industries must eliminate, mitigate, and reduce pollution arises from their industrial activities according to existing guidelines, laws, and regulations. Therefore, this subject will introduce various types of pollution control methods ranging from industrial effluents treatment system, air pollution control system and scheduled waste management. In addition, this subject will introduce the concept of sustainable development through **Sustainable Consumption and Production and Cleaner Production** abide with the latest guideline, policies, laws, and regulation.

### 4.0 REFERENCES

- a) Davis, Mackenzie L, and David A Cornwell. Introduction to Environmental Engineering. 6th Edition. Singapore: Mc Graw Hill, 2022. Link: <https://joycelau99.files.wordpress.com/2020/10/introduction-to-environmental-engineering.pdf>
- b) Davis, Mackenzie L, and Susan J Masten. Principle of Environmental Engineering and Science. 4th edition, New York: McGraw-Hill, 2021.
- c) Environmental Quality Act and Regulations: All Amendments Up to August, 2015. International Law Book Services, 2020. Link: [https://www.doe.gov.my/wp-content/uploads/2021/07/Environmental\\_Quality\\_Act\\_1974\\_-\\_ACT\\_127.pdf](https://www.doe.gov.my/wp-content/uploads/2021/07/Environmental_Quality_Act_1974_-_ACT_127.pdf)
- d) **SULAM PlayBook by MOHE - Garis Panduan Pelaksanaan SULAM di IPT** Link: [https://drive.google.com/file/d/1TMW4tze2uPCWpJ\\_qfA2fglwT-e1SEhrV/view](https://drive.google.com/file/d/1TMW4tze2uPCWpJ_qfA2fglwT-e1SEhrV/view)

## FACULTY OF INDUSTRIAL AND MANUFACTURING TECHNOLOGY AND ENGINEERING (FTKIP)

Course Code	Course Name	Programme
BMIP	Manufacturing Sustainability	Bachelor of Manufacturing Engineering Technology (Process and Technology)

MANUFACTURING SUSTAINABILITY		
BMIP2122	SEMESTER 2	SESSION 2025/2026



### TEACHING PLAN

FACULTY OF INDUSTRIAL AND MANUFACTURING TECHNOLOGY AND ENGINEERING

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

#### **1.0 : DESCRIPTION**

LO	Description
L001	Describe the sustainable development concepts, scope, and impacts in aspects of manufacturing.
L002	Apply sustainable manufacturing, including the 6 rs, in relation to environmental regulations, and the implications in business process
L003	Evaluate the impact of manufacturing on the environment, economy, and social sustainability.
L004	Demonstrate the concept of manufacturing sustainability in solving community problems through a group project.

#### **2.0 : SYNOPSIS**

THIS COURSE IS DESIGNED TO PROVIDE STUDENTS WITH AN UNDERSTANDING OF SUSTAINABILITY ISSUES, THE CONCEPTS AND THE SCOPE OF SUSTAINABLE MANUFACTURING (SM), THE STRATEGIES IN SM, THE MANAGEMENT APPROACHES IN SM, AND TOOLS COMMONLY USED IN SM. IN THE CURRENT SITUATION, INTEGRATING SUSTAINABILITY INTO THE BUSINESS PROCESS WILL ENHANCE THE BUSINESS'S TOTAL PERFORMANCE AND COMPETITIVENESS. SKILLS DEVELOPED AND KNOWLEDGE ACQUIRED FROM THIS COURSE WILL PREPARE STUDENTS TO BE ENVIRONMENTALLY CONSCIOUS ENGINEERS WHO ARE SENSITIVE TO ENVIRONMENTAL, ECONOMIC, AND SOCIAL/COMMUNITY-RELATED PROBLEMS AND CAPABLE OF SOLVING THOSE PROBLEMS AND ENHANCING THE TOTAL PERFORMANCE OF INDUSTRIES.

#### **3.0 : PRE-REQUISITE**

TIADA REKOD

#### **4.0 : MAIN TEXT BOOK**

1) ANIL MITAL AND ANOOP DESAI, (2020), SUSTAINABLE PRODUCT DESIGN AND DEVELOPMENT, CRC PRESS.

#### **5.0 : REFERENCES**

2) CARLO ARNALDO VEZZOLI, (2018), DESIGN FOR ENVIRONMENTAL SUSTAINABILITY: LIFE CYCLE DESIGN OF PRODUCTS 2ND EDITION, SPRINGER-VERLAG. MILAN, ITALY. 3) RAINER STARK, GÜNTHER SELIGER, JÉRÉMY BONVOISIN (2017) SUSTAINABLE MANUFACTURING, CHALLENGES, SOLUTIONS AND IMPLEMENTATION PERSPECTIVES, OPEN ACCESS BOOK SPRINGER NATURE 4) NAND K. JHA, (2016), GREEN DESIGN AND MANUFACTURING FOR SUSTAINABILITY, CRC PRESS

Course Code	Course Name	Programme
BMID	Pembangunan Lestari	Bachelor of Manufacturing Engineering Technology (Product Design)

 <b>Teaching Plan</b> FACULTY OF INDUSTRIAL & MANUFACTURING TECHNOLOGY & ENGINEERING UNIVERSITI TEKNIKAL MALAYSIA MELAKA		
<b>PEMBANGUNAN LESTARI</b>		
<b>BMID 4013</b>	<b>SEMESTER I</b>	<b>SESI 2025/2026</b>

**1.0 CQI actions to be undertaken this semester**

Incorporate real sustainability case studies and require students to engage with local communities as part of assessment.

**2.0 Learning Outcomes**

Upon completion of this course, students should be able to:

LO1 – Describe the elements of design for Dematerialization, Detoxification, Revalorization and Renewal. [P02] [C2] [SK4] [SP1, SP2, SP4]

LO2 – Design, various product types with minimum environmental effect. [P03] [P4] [SK5] [SP1, SP2, SP4]

LO3 – Analyze the environmental effect of product throughout its lifecycle. [P07] [A3] [SK7] [SP2, SP4, SP5]

**3.0 Synopsis**

Sustainable design or green product design is to incorporate product design to eliminate negative environmental impact completely through skillful, sensitive design. Manifestations of sustainable design require no non-renewable resources, impact the environment minimally, and relate people with the natural environment.

**4.0 References**

- [1]. Adisa Azapagic, Slobodan Perdan, Sustainable Development in Practice. Wiley - Blackwell, 2011
- [2]. David T.Allen, david R.Shonnard, Sustainable Engineering: Concepts, Design and Case studies, Prentice Hall 2012
- [3]. J. Paulo Davim, Sustainable Manufacturing , John Wiley and Sons, Inc. , 2010
- [4]. M K Ghosh Roy, Sustainable Development : environment , energy and water resources, Ane Books Pvt. Ltd , 2011
- [5]. Frederic P Miller, Agnes F Vandome, John McBrewster, Design for Environment, VDM Publishing House Ltd., 2010
- [6]. Michael F. Ashby, Materials and Sustainable Development, Butterworth-Heinemann Publishing , Elsevier Ltd. 2016
- [7]. Jonathan Chapman, Routledge Handbook of Sustainable Product Design, Taylor & Francis, 2019