Session II :
2025/2026

STUDENT'S STUDY GUIDE

POLITEKNIK MALAYSIA
SULTAN MIZAN ZAINAL ABIDIN

DIPLOMA IN CIVIL ENGINEERING

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Endorsement

This Student's Study Guide for this programme has been prepared and approved to be used by Session II : 2025/2026

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Assalamualaikum Warahmatullahi Wabarakatuh

I wish to welcome and congratulate all the junior students of Department of Civil Engineering, Polytechnic Sultan Mizan Zainal Abidin. Diploma in Civil Engineering provides practical training and knowledge for students to prepare themselves with skills in civil engineering to fulfill the nation's needs in public and private sectors. So, I hope all the students will use the opportunities wisely.

This booklet*, Student's Study Guide,* is a primary reference for students during their studies in polytechnics. It helps students to plan and understand the programme structure in other ways to allow early preparation for further their studies in the next semester.

With the implementation of the Outcome-Based Education (OBE) in PSMZA, I hope the students can get involved in all assessments that have been planned and grab the opportunities to complete their studies in polytechnic successfully.

I believe if the students can adapt themselves in the campus environment, always concentrate during lectures and active in all the activities planned, polytechnic's dream to produce quality graduates will become a reality.

Zahari bin Mohamad
Head of Civil Engineering Department
Department of Civil Engineering
Polytechnic Sultan Mizan Zainal Abidin

Assalamualaikum Warahmatullahi Wabarakatuh

Firstly, I wish to congratulate all the junior students of Department of Civil Engineering, Politeknik Sultan Mizan Zainal Abidin.

This Student's Study Guide contains all the important instruments in Diploma of Civil Engineering such as Programme Learning Outcome (PLO), synopsis of each course and complete programme structure for students to plan and complete their studies successfully. This is important as PSMZA is on their way to implementing the Outcome Base Education (OBE) and of course the students should know all the outcomes of learning in their studies.

Finally, during 3 years of study, I hope the students can manage their time and grab the oppurtunities to obtain good results to help PSMZA to produce competitive human capital in generating economy led by innovation.

Congratulations and Good Luck!

Muhamad Waridi bin Hadzali
Head of Programme (DKA)
Department of Civil Engineering
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INTRODUCTION

Vision of PSMZA

Menjadi Peneraju Institusi TVET yang Unggul.
To be the Leading-Edge TVET Institution.

Mission of PSMZA

1. Menyediakan akses yang meluas kepada program TVET berkualiti dan diiktiraf.
To provide wide access to quality and recognised TVET programmes.

2. Memperkasa komuniti melalui pembelajaran sepanjang hayat.
To empower communities through lifelong learning.

3. Melahirkan graduan holistik, berciri keusahawanan dan seimbang.
To develop holistic, entrepreneurial and balanced graduates.

4. Memanfaatkan sepenuhnya perkongsian pintar dengan pihak berkepentingan.
To capitalise on smart partnership with stakeholder.

Vision of JKA

JKA aspires to be a center of educational excellence in the field of civil engineering to produce graduates who are competent, honorable and responsible in accordance with the *Falsafah Pendidikan Negara*.

Mission of JKA

Aim to produce semi-professional workforce of competent and competitive, quality and able to meet the need of Malaysia current industry.

Department of Civil Engineering (JKA)

Department of civil engineering is one of the academic departments at the Polytechnic of Sultan Mizan Zainal Abidin (PSMZA), Dungun, Terengganu that has been established in 2002. JKA aims to produce well-trained student, efficient, skilled in construction industries.

The department is currently led by En. Zahari Bin Mohamad as Head of Department and assisted by Ts. Khairul Azam bin Elias as Head of Program. JKA has 46 lecturers, 2 Assistant Engineer, 1 Lab Assistant who manage and maintain the lab equipment and assist administrative work.

JKA offers diploma program which is **Diploma in Civil Engineering** - that provides practical training and knowledge for students to prepare themselves with skills in construction industries to fulfill the nation's needs in public and private sectors.

CURICULUM PROGRAM FOR DIPLOMA IN CIVIL ENGINEERING

Programme Overview

a. Introduction

Diploma in Civil Engineering provides knowledge, skills and attitude to adapt to new technology in Civil Engineering with the ability to demonstrate professionalism and work ethics in fulfilling responsibilities towards the creator, client and society. This programme provides theory as well as carries out practical work. This programme also offers courses in Civil Engineering areas such as Engineering Graphics, Water & Water Resources Engineering, Environment, Strength & Structural Design, Road & Transportation, Engineering Management and Geotechnics. This programme is specially designed with hands-on training in addition to theoretical learning in civil engineering. They are required to complete industrial training to prepare graduates for employment in different sectors of the industry because the skills and knowledge acquired are used throughout modern industry.

They will be able to use appropriate communication and interpersonal skills to perform tasks in various situations. Graduates will demonstrate desired behavioural traits like integrity, teamwork, problem solving and passion in performing the tasks related to their area of specialization. They will possess entrepreneurial skills to contribute to the economic growth for the nation’s development in the construction industries. With these additional skills, they will be more competitive in the present job market.

b. Synopsis

This programme is designed to equip students with sound knowledge, skills, attitude and understanding of the environment, construction industries, construction designs and infrastructural development of civil engineering. The knowledge and skills acquired will be useful for success in future or current employment.

c. Job Prospect

The knowledge and skills that the students acquire from the program will enable them to participate in the job market such as specified as:

a. Technical Assistant
b. Site Supervisor
c. Inspector of Work
d. Assistant Engineer
e. Contractor
f. Health and Safety Officer
g. Research Assistant
h. Quality Control Assistant Engineer
i. Material Coordinator
j. Entrepreneur

d. Programme Aim

This programme believes that all individuals have potential to be proactive and responsible senior technicians to support national agenda in transforming construction industry to be highly productive, environmentally sustainable with globally competitive players while focused on safety and quality standards.

e. Programme Educational Objectives (PEO)

The Diploma in Civil Engineering programme shall produce semi-professionals who are:

PEO1: Working in the related field of Civil Engineering
PEO2: Lead team members in fulfilling their roles within industries or whether leading or contributing, individuals are vital to fulfilling their roles in industries.
PEO3: Engaged in activities to enhance knowledge or embark their own enterprise
PEO4: Fulfill professional and communities' responsibilities, conforming to ethical and environmental values

Programme Learning Outcomes (PLO)

Upon completion of the programme, students should be able to:

PLO1: Apply knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization as specified in DK1 to DK4 respectively to wide practical procedures and practices.

PLO2: Identify and analyze well-defined engineering problems reaching substantiated conclusions using codified methods of analysis specific to their field of activity. (DK1 to DK4)

PLO3: Design solutions for well-defined technical problems and assist with the design of systems, components, or processes to meet specified needs with appropriate consideration for public health and safety as well as cultural, societal, and environmental considerations as required (DK5)

PLO4: Conduct investigations of well - defined problems; locate and search relevant codes and catalogues, conduct standard tests and measurements (DK8)

PLO5: Apply appropriate techniques, resources, and modern computing, engineering, and IT tools to well defined engineering problems, with an awareness of the limitations. (DK2 and DK6)

PLO6: When solving well-defined engineering problems, evaluate sustainable development impacts* to: society, the economy, sustainability, health and safety, legal frameworks, and the environment (DK1, DK5, and DK7)

PLO7: Understand and commit to professional ethics and norms of technician practice including compliance with relevant laws. Demonstrate an understanding of the need for diversity and inclusion (DK9)

PLO8: Function effectively as an individual, and as a member or leader in diverse and inclusive teams and in multi-disciplinary, face-to-face, remote and distributed settings (DK9)

PLO9: Communicate effectively and inclusively on well-defined engineering activities with the engineering community and with society at large, by being able to comprehend the work of others, document their own work, and give and receive clear instructions.

PLO10: Demonstrate awareness of engineering management principles as a member or leader in a technical team and to manage projects in multidisciplinary environments.

PLO11: Recognize the need for, and have the ability for independent updating in the face of specialized technical knowledge (DK8)

Notes:

DK 1: A descriptive, formula-based understanding of the natural sciences applicable in a sub-discipline and awareness of directly relevant social sciences

DK 2: Procedural mathematics, numerical analysis, statistics applicable in a subdiscipline

DK 3: A coherent procedural formulation of engineering fundamentals required in an accepted sub-discipline

DK 4: Engineering specialist knowledge that provides the body of knowledge for an accepted sub-discipline

DK 5: Knowledge that supports engineering design and operations based on the techniques and procedures of a practice area

DK 6: Codified practical engineering knowledge in recognized practice area

DK 7: Knowledge of issues and approaches in engineering technician practice, such as public safety and sustainable development*

DK 8: Engagement with the current technological literature of the practice area

DK 9: Ethics, inclusive behavior and conduct. Knowledge of professional ethics, responsibilities, and norms of engineering practice. Awareness of the need for diversity by reason of ethnicity, gender, age, physical ability etc. with mutual understanding and respect, and of inclusive attitudes

Dublin Knowledge refers to the Knowledge Profile as listed in the Manual of Engineering Technician Education Programme Accreditation Standard (ETAC) for diploma programmes.

Programme Structure – Matrix of Courses Vs Programme Learning Outcomes (PLO)

COURSE TYPE	COURSE CODE	COURSE NAME	CONTACT HOURS				CREDIT VALUES	PROGRAMME LEARNING OUTCOME (PLO)											PRE-REQUISITE
								PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11	
			L	P	T	O		Engineering Knowledge	Problem Analysis	Design/Development of Solutions	Investigation	Tool Usage	The Engineer and the World	Ethics	Individual and Collaborative Teamwork	Communication	Project Management and Finance	Life Long Learning	
SEMESTER 1																			
Compulsory	DUE10062	Technical English 1	1	0	2	0	2									A3, A3		A2	
	MPU24031	Bahasa 1	0	2	0	0	1								F2		A3		
	MPU24041	Kelab/ Persatuan 1																	
	MPU24XX1	Unit Beruniform 1																	
Common Core	DUW10042	Occupational Safety and Health for Engineering	2	0	0	0	2	C2			A3		A3						
Common Core	DBM10163	Engineering Mathematics 1	2	0	2	0	3	C3	C3						A3				
Common Core	DBS10042	Engineering Science	2	1	0	0	2	C3			F3		A3						
Discipline Core	DCC10273	Building Construction Workshop	0	4	0	0	3				F4	F4			A3				
Discipline Core	DCC10283	Civil Engineering Drawing	0	4	0	0	3				F4	F4						A3	
Discipline Core	DCC10292	Construction Materials	2	0	0	0	2	C3					A3			A2			
		TOTAL				24	18												
SEMESTER 2																			
Compulsory	MPU21072	Penghayatan Etika dan Peradaban	1	0	2	0	2							A2	A2		A3		
	MPU24051	Bahasa 2	0	2	0	0	1								F2		A3		MPU 24031
	MPU24061	Kelab/Persatuan 2																	MPU 24041
	MPU24XX1	Unit Beruniform 2																	MPU 24XX1
Common Core	DBM20173	Engineering Mathematics 2	2	0	2	0	3	C3	C3						A3				DBM10013
Discipline Core	DCC20303	Civil Engineering Survey	2	3	0	0	3	C3				F4					A3		
Discipline Core	DCC20312	Pavement Engineering	2	0	1	0	2	C3		C4					A3				
Discipline Core	DCC20322	Estimating and Quantity Measurement	2	1	0	0	2		C4					A4			A3		
Discipline Core	DCC20332	Soil Mechanics	2	0	1	0	2	C3	C3									A3	
Discipline Core	DCC20342	Soil Mechanic & Pavement Engineering Laboratory	0	3	0	0	2				C4	F4		A4					
Discipline Core	DCC20391	Technician and Sustainable Development	1	1	0	0	1						A4	C3					
		TOTAL					17												
SEMESTER 3																			
Compulsory	DUE30072	Technical English 2	1	0	2	0	2									A2, A3		A3	
Compulsory	MPU23182	Sains Teknologi dan Kejuruteraan Islam*	1	0	2	0	2							A3	A2		A4		
	MPU23172	Nilai Masyarakat Malaysia**																	
Common Core	DUU10072	Entrepreneurship	1	0	2	0	2					F2				A3	A3		
Discipline Core	DCC30352	Fluids Mechanics	2	0	1	0	2	C3	C3							A3			
Discipline Core	DCC30362	Geotechnical Engineering	2	0	1	0	2		C4		C4					A3			DCC20332
Discipline Core	DCC30373	Structural Mechanic	3	0	1	0	3	C3	C4			C3							
Discipline Core	DCC30382	Traffic Engineering	2	1	0	0	2			C4		F4					A3		
		TOTAL					15												
SEMESTER 4																			
Compulsory	DUE50082	Technical English 3	1	0	2	0	2									A4, A4		A3	
Discipline Core	DCC40402	Structure, Hydraulics and Water Quality Laboratory	0	3	0	0	2				C4	F4		A4					
Discipline Core	DCC40412	Hydraulics	2	0	1	0	2	C3	C4						A3				DCC30352
Discipline Core	DCC40423	Structural Analysis	3	0	1	0	3	C3	C4			C3							DCC30373
Discipline Core	DCC40433	Reinforced Concrete Design	3	2	0	0	3			C3		C5	A4						DCC30373
Discipline Core	DCC40441	Final Year Project 1	0	2	0	0	1		C4		C3					A5		A4	
Discipline Core	DCC40452	Water Supply and Sewerage System	2	0	0	0	2	C3	C4							A5			
Electives	DCC4XXX	Electives 1	2	0	0	0	2				C4	F4			A3				
		TOTAL					17												
SEMESTER 5																			
Compulsory	MPU22071	Kursus Integriti dan Antirasuah	0	0	2	0	1								A2		A3		
Discipline Core	DCC50402	Environmental Pollution & Control	2	0	0	0	2				C4		C3					A4	
Discipline Core	DCC50502	Steel Structure Design	2	2	0	0	2			C4		C5	A4						DCC30373
Discipline Core	DCC50513	Final Year Project 2	0	5	0	0	3			C5		F4	A4			A4	A4		DCC40441
Discipline Core	DCC50522	Engineering Hydrology	2	1	0	0	2	C3	C4				C3						
Discipline Core	DCC50532	Project Management and Practices	2	1	0	0	2				C4	C3					A3		
Electives	DCC5XXX	Electives 2	2	0	0	0	2					F4		A3				A4	
		TOTAL					14												
SEMESTER 6																			
Industrial Training	DUT600910	Engineering Industrial Training	0	10	0	0	10		C3			F4	A3	A5	F4	A4		F4	
		TOTAL	0	10	0	0	10												

ELECTIVES																		
Electives	DCC40462	Railway Construction and Maintenance	2	0	0	0	2				C4	P4			A5				
Electives	DCC40472	Building System and Maintenance	2	0	0	0	2				C4	P4			A3				
Electives	DCC40482	Smart City and Civil Engineering	2	1	0	0	2				C4	P4			A4				
Electives	DCC40572	Site Supervisor Competency	2	1	0	0	2				C4	P4			A3				
Electives	DCC50542	Industrialised Building System (IBS)	0	3	0	0	2					P4		A3				A4	
Electives	DCC50552	Workmanship in Construction Industry	2	1	0	0	2					P4		C4				A4	
Electives	DCC50562	Building Information Modelling (BIM)	0	4	0	0	2					P4		A3				A4	
FREE ELECTIVES																			
	DUD10012	Design Thinking	1	0	0	1	2			C6					A3				

Course Type	Total Credit	Total %
i. Compulsory	15	27.0%
ii. Common Core	10	
iii. Discipline Core	53	69.0%
iv. Specialization	0	
v. Industrial Training	10	
vi. Electives	4	4.0%
Total Credit	**92**	**100%**

Engineering and Engineering Technology Courses		
Total Credit (Discipline Core, Specialization, Industrial Training)	**63**	
	Credit	**%**
i. Practice - Oriented Components	30	33

Legend:

L: Lecture, **P**: Practical / Lab, **T**: Tutorial, **O**: Others

(The numbers indicated under L, P, T & O represent the contact hours per week, to be used as a guide for time table preparation)

*For Muslim Students

**For Non-Muslim Students

Notes:

1. The total hours of **SLT** for **Industrial Training** is 800 hours or equivalent to 20 weeks.
2. The minimum and maximum credit value of Electives must be referred to the programme standard or professional bodies.
3. **Elective** courses offered are cross -disciplinary and can be chosen from courses listed in the program structure or any courses listed in the inventory of other disciplines; but must adhere to prerequisite requirement in the Programme Information.
4. **Free Electives** are courses which **are not included** in any programme structure but if taken, will contribute towards students' CGPA, provided that institutions adhere to the Jabatan Pendidikan Politeknik & Kolej Komuniti Free Electives Guidelines.
5. **MPU22042 Bahasa Kebangsaan A** is **COMPULSORY** for students who did not attain credit in Bahasa Melayu at Sijil Pelajaran Malaysia (SPM) level and will contribute to students' CGPA.
6. Co-curriculum pathways:
   a. Path 1: Sukan
   b. Path 2: Kelab/Persatuan
   c. Path 3: Unit Beruniform

Programme Structure

COURSE TYPE	COURSE CODE	COURSE NAME	CONTACT HOURS				CREDIT VALUES
			L	P	T	O	
SEMESTER 1							
Compulsary	DUE10062	Technical English 1	1	0	2	0	2
	MPU24031	Sukan 1	0	2	0	0	1
	MPU24041	Kelab/ Persatuan 1					
	MPU24XX1	Unit Berunform 1					
Common Core	DUW10042	Occupational Safety and Health for Engineering	2	0	0	0	2
	DBM10163	Engneering Mathematics 1	2	0	2	0	3
	DBS10042	Engneering Science	2	1	0	0	2
Disipline Core	DCC10273	Building Construction Workshop	0	4	0	0	3
	DCC10283	Civil Engineering Drawing	0	4	0	0	3
	DCC10292	Construction Materials	2	0	0	0	2
TOTAL			**24**				**18**
SEMESTER 2							
Compulsary	MPU21072	Penghayatan Etika dan Peradaban	1	0	2	0	2
	MPU24051	Sukan 2	0	2	0	0	1
	MPU24061	Kelab/Persatuan 2					
	MPU24XX1	Unit Berunform 2					
Common Core	DBM20173	Engneering Mathematics 2	2	0	2	0	3
Disipline Core	DCC20303	Civil Engineering Survey	2	3	0	0	3
	DCC20312	Pavement Engineering	2	0	1	0	2
	DCC20322	Estimating and Quantity Measurement	2	1	0	0	2
	DCC20332	Soil Mechanics	2	0	1	0	2
	DCC20342	Soil Mechanic & Pavement Engineering Laboratory	0	3	0	0	2
	DCC20391	Technician and Sustainable Development	1	1	0	0	1
TOTAL			**28**				**18**
SEMESTER 3							
Compulsary	DUE30072	Technical English 2	1	0	2	0	2
	MPU23182	Sains Teknologi dan Kejuruteraan Islam*	1	0	2	0 0	2
	MPU23172	Nilai Masyarakat Malaysia**					
Common Core	DUU10072	Entrepreneurship	1	0	2	0	2
Disipline Core	DCC30352	Fluids Mechanics	2	0	1	0	2
	DCC30362	Geotechnical Engineering	2	0	1	0	2
	DCC30373	Structural Mechanic	3	0	1	0	3
	DCC30382	Traffic Engineering	2	1	0	0	2
TOTAL			**22**				**15**

COURSE TYPE	COURSE CODE	COURSE NAME	CONTACT HOURS				CREDIT VALUES
			L	P	T	O	
SEMESTER 4							
Compulsary	DUE50082	Technical English 3	1	0	2	0	2
Disipline Core	DCC40402	Structure, Hydraulics and Water Quality Laboratory	0	3	0	0	2
	DCC40412	Hydraulics	2	0	1	0	2
	DCC40423	Structural Analysis	3	0	1	0	3
	DCC40433	Reinforced Concrete Design	3	2	0	0	3
	DCC40441	Final Year Project 1	0	2	0	0	1
	DCC40452	Water Supply and Sewerage System	2	0	0	0	2
Elective	DCC4XXX	Electives 1	2	0	0	0	2
TOTAL			**24**				**17**
SEMESTER 5							
Compulsary	MPU22071	Kursus Integriti dan Antirasuah	0	0	2	0	1
Disipline Core	DCC50492	Environmental Pollution & Control	2	0	0	0	2
	DCC50502	Steel Structure Design	2	2	0	0	2
	DCC50513	Final Year Project 2	0	5	0	0	3
	DCC50522	Engineering Hydrology	2	1	0	0	2
	DCC50532	Project Management and Practices	2	1	0	0	2
Elective	DCC5XXX	Electives 2	2	0	0	0	2
TOTAL			**21**				**14**
SEMESTER 6							
Indusrial Training	DUT600910	Engineering Industrial Training	0	10	0	0	10
TOTAL			**10**				**10**

Course Synopsis

COURSE CODE		SYNOPSIS	COURSE LEARNING OUTCOMES (CLO)
SEMESTER 1	DCC10273	**BUILDING CONSTRUCTION WORKSHOP** aims to provide participants with a comprehensive understanding of the fundamental principles, techniques, and best practices in the field of building construction. The workshop will cover various aspects of the construction process.	**CLO 1:** display ability to utilize the appropriate tools and techniques for workshop practical tasks in accordance with standard **CLO 2:** manipulate techniques with the appropriate tools to complete the mini-project task **CLO 3:** work as a team to complete practical tasks and mini project activities
	DCC10283	**CIVIL ENGINEERING DRAWING** covers a range of topics in computer-aided drafting and building information modelling for civil engineering. The course involves the fundamentals of drafting using CAD, including recognizing the CAD interface, understanding coordinate systems, and configuring drawing settings. Students will acquire skills in managing elements through the creation of layers, controlling properties and organizing drawings. Students also explore creating, editing, and annotating objects, such as lines, arcs, circles, and text, with precise control over their attributes. The course extends into basic architectural drawing, teaching the construction of 2D floor plans and structural detail drawings. The next section focuses on BIM for structure, including tools for starting structural projects and building structural elements.	**CLO 1:** construct 2D and 3D engineering drawing using appropriate tools correctly. **CLO 2:** manipulate drawing tools and techniques to complete civil engineering according to spesification and requirements given. **CLO 3:** initiated self-directed learning principles to effectively present the step-by-step process of drawing

COURSE CODE		SYNOPSIS	COURSE LEARNING OUTCOMES (CLO)
SEMESTER 1	DCC10292	**CONSTRUCTION MATERIALS** course aims to equip students with a comprehensive knowledge of construction materials in civil engineering field. The curriculum provides a comprehensive overview of civil engineering materials and a detailed exploration of concrete materials comprising cement, aggregate, water and admixtures. The course also covers concrete mixtures extensively and explores the characteristics of both fresh and hardened concrete. Moreover, the course explores the properties of timber, types and characteristics of bricks and concrete blocks, and basic concept of steel materials. This course additionally provides knowledge regarding advanced construction materials and methods for each respective topic.	**CLO 1:** explain civil engineering materials and methods in construction practice **CLO 2:** propose selection of material and method in construction practice with consideration of construction specification, condition and sustainability **CLO 3:** present the task given with effective communication skills
SEMESTER 2	DCC20303	**CIVIL ENGINEERING SURVEY** course provides students with fundamental knowledge and practical skills related to surveying in the field of engineering. Surveying is a crucial aspect of engineering and construction, as it involves measuring and mapping the physical characteristics of land, structures, and infrastructure. This information is essential for designing, planning, and executing various engineering projects.	**CLO 1:** apply fundamental surveying principles in civil engineering practice **CLO 2:** organize surveying tasks using surveying instruments in accordance with standard procedures **CLO 3:** work as team to complete practical tasks and project
	DCC20312	**PAVEMENT ENGINEERING** is a field of study that explores the historical aspects of road pavement construction and the organizations involved in Malaysia. This course is designed to impart knowledge about the methods and designs utilized in pavement engineering. The emphasis of this course lies in introducing students to pavement engineering, covering topics such as pavement materials and testing, flexible pavement design, alternative pavement, and pavement maintenance.	**CLO 1:** explain pavement models utilize in pavement engineering **CLO 2:** evaluate pavement engineering design principles in accordance to specifications and standards **CLO 3:** work as a team to complete grouping task activity

COURSE CODE		SYNOPSIS	COURSE LEARNING OUTCOMES (CLO)
SEMESTER 2	DCC20322	**ESTIMATING AND QUANTITY MEASUREMENT** is a study of preliminary estimating method, built-up rate and quantity measurement. An estimate of a project is a forecast of its probable cost. The quantity measurement is calculated by studying and analysing the drawings of the structure (dimensions on the drawings). This module emphasies on an estimate which includes complete quantitative details of the material required to complete the project.	**CLO 1:** estimate the cost of construction project by using estimating and quantity measurement **CLO 2:** adhere the standard of calculation in estimating and quantity measurement **CLO 3:** complete grouping project task within the allocated time
	DCC20332	**SOIL MECHANICS** is the scientific discipline that investigates the properties and behavior of soil, a fundamental component of the Earth's crust. It encompasses the study of soil composition, structure, and the interactions between soil particles and water. The primary objectives of soil mechanics are to understand how soils respond to external forces, bear loads and deform under different conditions.	**CLO 1:** apply concept and principal of soil mechanics in civil engineering **CLO 2:** utilize formulas or methods to solve problems in soil mechanics **CLO 3:** propose self-directed learning related to soil mechanics problem and theories
	DCC20342	**SOIL MECHANIC AND PAVEMENT ENGINEERING LABORATORY** covers knowledge in the form of practical through the experiments with are carried out based on the concepts and the theories learned in the class. The emphasis of the course is on the method of conducting experiments, analysis and understanding its relationship with theories learned. The course also focused on the geotechnical and highway which are the core of the civil engineering field.	**CLO 1:** construct instrumentation, measurement techniques, models, and simulations in a soil and pavement engineering laboratory in accordance with procedures outlined in a laboratory manual / standard **CLO 2:** adhere to safety protocols consistently throughout laboratory procedures according to osh standard **CLO 3:** analyze the laboratory result with reference to current practices with relevant reference or literature review

COURSE CODE		SYNOPSIS	COURSE LEARNING OUTCOMES (CLO)
SEMESTER 2	DCC20391	**TECHNICIAN AND SUSTAINABLE DEVELOPMENT** is a course that focuses on the introduction to engineering technician in civil engineering which is covers the roles and responsibility of technician in the context of their employment in industry, the role of professional bodies and IOW in context of civil engineering practice. In this course, students will be exposed to sustainability concept and practices in Malaysia that related to civil engineering field. This course also covers about the connection between Tehnician and Sustainability Development Goals (SDGs), the implementation of SDGs and the contribution of technician towards SDGs. It is also cover a creative and innovative approaches in engineering problem-solving skills and professional codes of ethics. The students willbe able to demonstrate excellent teamwork skills for working in group assessment and organizing activities of engineering practices in the society.	**CLO 1:** describe technician code of conduct in engineering practices that fosters diversity and inclusion in engineering solution **CLO 2:** organize technician and community project related the sustainability impact on engineering project
SEMESTER 3	DCC30352	**FLUID MECHANICS** covers the behaviour and characteristics of engineering fluids and their application in hydrostatic and hydrodynamic fluids. This course involves discussion on fluid properties, fluid flow concept and basic equations, moving fluid forces, dimensional analysis, flow in closed conduits and pipe network, and momentum equations.	**CLO 1:** apply fundamental principles and applications of fluid mechanics in civil engineering **CLO 2:** select appropriate principles of fluid mechanics to solve civil engineering problems **CLO 3:** explain fundamental and principles in fluid mechanics in formal presentation

COURSE CODE		SYNOPSIS	COURSE LEARNING OUTCOMES (CLO)
SEMESTER 3	DCC30362	**GEOTECHNICAL ENGINEERING** is a branch of civil engineering dedicated to understanding and managing the interactions between soil, water, and man-made structures. It involves the application of principles from soil mechanics and engineering geology to address the challenges associated with the development and maintenance of civil engineering projects. It also covers soil improvement works such as seepage, slope stability, lateral earth pressure and retaining wall and foundation.	**CLO 1:** select suitable analytical methods to solve geotechnical engineering problems **CLO 2:** examine geotechnical structures through analytical methods to assess stability and safety in civil engineering projects **CLO 3:** explain effectively on industry-standard practices for solving geotechnical challenges
	DCC30373	**STRUCTURAL MECHANICS** encompasses the principles and fundamentals of material strength, the behaviour of loaded structures, and types of forces acting on the structure. The effects of loads on normal, bending, and shear stress, as well as on slope, and deflection are covered in this course. This fundamental is essential for understanding strength and structural design in civil engineering.	**CLO 1:** apply fundamental knowledge and principles of the mechanics in civil engineering structure **CLO 2:** analyze the structure behaviour in a determinate structure based on the problem given **CLO 3:** examine the manual calculation of structure behaviour in a determinate beam with software based calculation

COURSE CODE		SYNOPSIS	COURSE LEARNING OUTCOMES (CLO)
SEMESTER 3	DCC30382	**TRAFFIC ENGINEERING** is a branch of civil engineering that deals with the planning, design and management of transportation systems and the efficient flow of traffic on roadways. It involves various aspects such as geometrical design, traffic signal design, traffic safety measures, signage and transportation planning.	**CLO 1:** evaluate the design solutions for the components and processess in traffic engineering according to current practiced standards **CLO 2:** display appropriate methods, techniques or tools for traffic analysis and design according to current practice standards **CLO 3:** share effective knowledge in traffic engineering and management to complete a mini project
SEMESTER 4	DCC40402	**STRUCTURE, HYDRAULICS AND WATER QUALITY LABORATORY** covers knowledge in the form of practical through the experiments which are carried out based on the concepts and the theories learned in the class. The emphasis of the course is on the method of conducting experiments, analysis and understanding its relationship with theories learned. The course also focused on the structure, hydraulics and water quality, which are the core of the civil engineering field.	**CLO 1:** construct appropriate instrumentation/ measurement techniques/ models/ simulation in structure, hydraulics and water quality engineering using standard procedure and equipment **CLO 2:** practices the importance of achieving safety in structure, hydraulics and water quality according to OSH standard **CLO 3:** select appropriate experiments and analyze the results in the solution of civil engineering problems

COURSE CODE		SYNOPSIS	COURSE LEARNING OUTCOMES (CLO)
	DCC40412	**HYDRAULICS** covers the application of hydrostatic and hydrodynamic fluids. This course involves discussion on hydrostatics concepts and basic equations of stability and buoyancy. This course also emphasizes the application of constituents of the open channel flow concept and pumps appropriately in solving hydraulics problems.	**CLO 1:** explain the fundamental and principles in hydraulic engineering **CLO 2:** determine the principles of hydraulic engineering in pumps and fluid flow **CLO 3:** organize group work load equitably and ethically to solve in civil engineering problem
SEMESTER 4	DCC40423	**STRUCTURAL ANALYSIS** course is designed to expose the student to analysing statically determinate and statically indeterminate structures, which consist of a beam, a portal frame, and trusses. For statically indeterminate beams and portal frames, the method to analyse the internal moment is moment distribution. Analysis of an indeterminate beam and portal frame, including drawing the shear force and bending moment diagram. Students will also be taught the use of an influence line to solve problems involving determinate beams subjected to a live or moving load. At the end of the course, students should be able to analyse the internal member forces for determinate and indeterminate 2D pin-jointed trusses using the method of joint and force method. It also includes the analysis of the joint displacement for statically determinate trusses using the method of virtual work.	**CLO 1:** utilize moment distribution method to determine internal moment and reaction in statically indeterminate and determinate of beams and portal frames **CLO 2:** select appropriate methods to analyze internal forces and displacements of 2d pin-jointed structures, tailored to the specific problem requirements and condition given **CLO 3:** make use of manual structural analysis calculations to software-based calculations

COURSE CODE		SYNOPSIS	COURSE LEARNING OUTCOMES (CLO)
SEMESTER 4	DCC40433	**REINFORCED CONCRETE DESIGN** covers concepts and methods of design for reinforced concrete structures comprising beams, slabs, columns and foundation. This course emphasizes knowledge and practice of producing double-storey reinforced concrete building designs starting from the layout plan, action analysis, structural design, and detailing according to Eurocode 2 (EC2).	**CLO 1:** calculate a design of double storey reinforced concrete building accordingly to requirement of Eurocode 2 **CLO 2:** assess output for double storey reinforced concrete structure design according to Eurocode 2 **CLO 3:** integrate sustainable design principles in design project
	DCC40441	**FINAL YEAR PROJECT 1** covers as a comprehensive exploration of knowledge and practical skills within civil engineering, and by integrating the principles of design thinking students are encouraged to approach challenges with a holistic and innovative mindset aligning with Sustainable Development Goals (SDGs). This course emphasizes the cultivation of essential soft skills, including effective communication, collaborative teamwork, meticulous work planning, sound decision-making, and fostering creativity within the available facilities. It also provides a dynamic platform for students to integrate theoretical understanding with hands-on application.	**CLO 1:** analyze well-define engineering problem to establish project tittle, objective and scope of work **CLO 2:** develop a methodology with valid standard/reference that related to the field of project **CLO 3:** display ability to communicate effectively through project proposal and presentation

COURSE CODE		SYNOPSIS	COURSE LEARNING OUTCOMES (CLO)
SEMESTER 4	DCC40452	**WATER SUPPLY AND SEWERAGE SYSTEM** is a study of water resources, water characteristics, usage and demand of water supply, raw water treatment process and water distribution system. This course also includes the information on the process in sewage treatment plant, sludge treatment and disposal. It also emphasizes on the drinking water parameter and effluent from sewage treatment plant.	**CLO 1:** apply fundamental concept of water supply and sewerage system in civil engineering **CLO 2:** conclude the water supply and sewerage water system problem in accordance of condition and method of treatment **CLO 3:** perform formal presentation based on given task actively
	DCC40462	**RAILWAY CONSTRUCTION AND MAINTENANCE** is a comprehensive syllabus designed to equip students with the necessary knowledge and skills for a successful career in the railway industry. Key areas include introduction to railway construction, permanent way (railway track), geometric design of railway, interface with civil engineering structure and railway track maintenance. The curriculum combines theoretical understanding with real-world applications to ensure graduates are well prepared for the challenges of railway infrastructure development and maintenance.	**CLO 1:** examine the issues or technologies of railway maintenance in Malaysia **CLO 2:** construct the integration of railway construction system according to the condition requiment **CLO 3:** display positive teamwork atititude by contribute actively during assigned task.
	DCC40472	**BUILDING SYSTEM AND MAINTENANCE** focuses on the basic concepts and the principles of the systems in a building. The course emphasizes on the electrical system in building, firefighting system, building transportation system, air conditioning system, plumbing and sanitary system in building and maintenance works.	**CLO 1:** analyse the concept of building system and maintenance in civil engineering construction **CLO 2:** perform using appropriate tools in building services with safety awareness practically **CLO 3:** demonstrates capacity for technical group in practical activities actively

COURSE CODE		SYNOPSIS	COURSE LEARNING OUTCOMES (CLO)
SEMESTER 4	DCC40482	**SMART CITY AND CIVIL ENGINEERING** course is designed to offer students a comprehensive insight into the seamless integration of smart city technologies with civil engineering principles. It fosters a practical learning approach by engaging students in hands-on projects that highlight the significance of sustainable and intelligent urban development. By delving into real-world applications, students will not only acquire practical skills but also develop a deep understanding of how smart technologies can be effectively leveraged in civil engineering practices. This course empowers students to make meaningful contributions to the dynamic realm of smart cities, equipping them with the expertise needed to navigate and thrive in this evolving field	**CLO 1:** evaluate the model, implementation and challenging of smart cities in perspective of civil engineering **CLO 2:** organize design thinking methodology to develop design solution of project related to smart city and civil engineering **CLO 3:** adhere ethical principles of teamwork to complete group tasks
	DCC40572	**SITE SUPERVISOR COMPETENCY** course is meticulously crafted to synchronize with the Site Supervisor Competency (CVS3) prescribed in the National Occupational Skills Standard (NOSS). The course content is meticulously structured to comprehensively address the skills and competencies delineated within the CVS3 NOSS framework, with a primary emphasis on the strategic planning, meticulous scheduling, and vigilant monitoring essential for effective site construction management. The assessment of this course will thoroughly evaluate the practical application of site supervisors' management and planning skills in real-world scenarios, ensuring a comprehensive understanding of their capabilities in effective site construction management.	**CLO 1:** classify relevant skills and competencies related to tasks and issues associated with site supervision **CLO 2:** manipulate software and it tool for planning and monitoring of construction activities **CLO 3:** works as a team to complete grouping task within the time allocation given

RELATED REFERENCES

Student support services and facilities

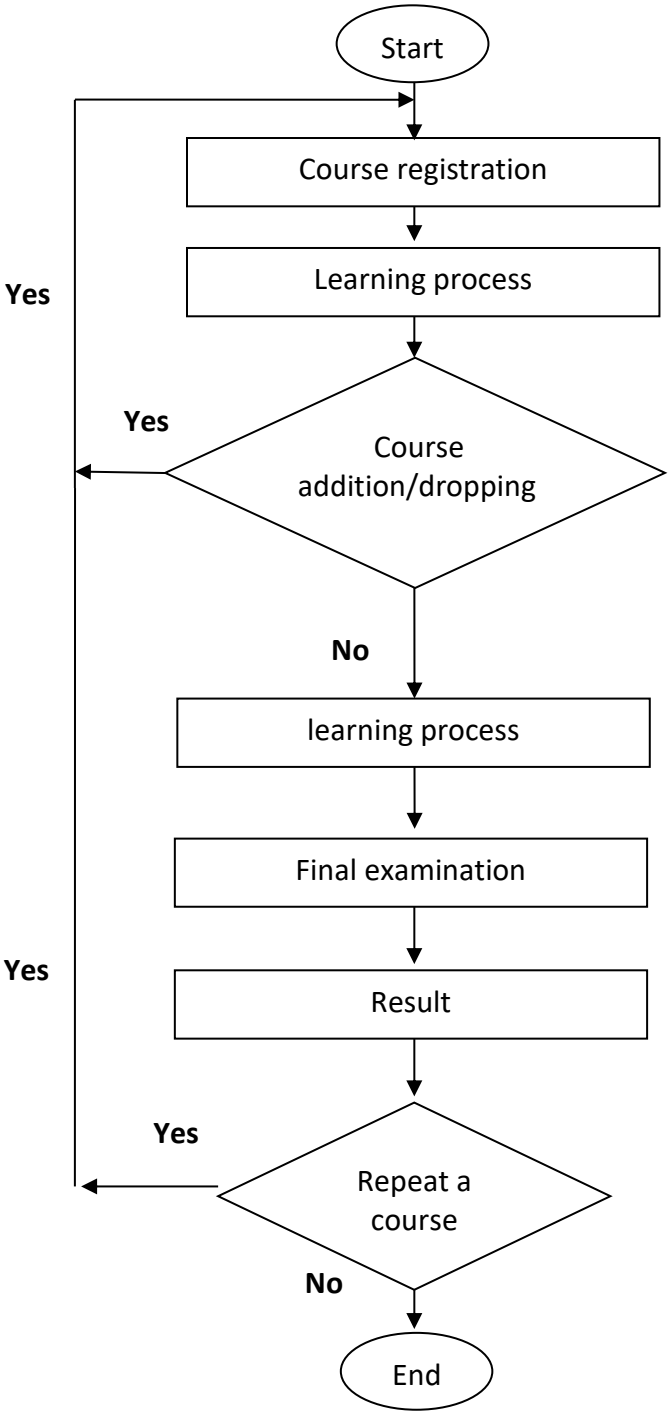
1. Hostel
2. Health service
3. Insurance
4. Financial aid
5. Sport Facilities
6. Library
7. Canteen / Cafeteria
8. Pusat Islam
9. Lecture Hall
10. Koperasi
11. Alumni
12. Counseling Unit, Career and Entrepreneurship Unit
13. Customer Feedback Form, suggestion box and website
14. ICT facilities (Cyber Cafe Center, Local Area Network (LAN) system, Wireless, etc)

Student's Act

Refer "Buku Panduan dan Peraturan Am Pelajar Politeknik, Jabatan Pengajian Politeknik" for further information.

Teaching and Learning Process

Student in *Diploma in Civil Engineering (DKA)* should accomplish 6 semesters for teaching and learning process and for each semester, the steps are as below:



- In 7 days after new semester
- In week 3 until week 6 on each lecture session
- Can only be taken 3 times for each course

Examination

Refer *"Arahan-arahan Peperiksaan dan Kaedah Penilaian"* for further information.

Academic Advisory System

Academic Advisory System (AAS) is a systematic communication system for students to get guidance, advice and information from a reliable source. AAS helps students determine the direction towards academic excellence and generic student attribute.

Refer "Garis Panduan Kecemerlangan Sistem Penasihatan Akademik Politeknik, Jabatan Pengajian Politeknik" for further information.

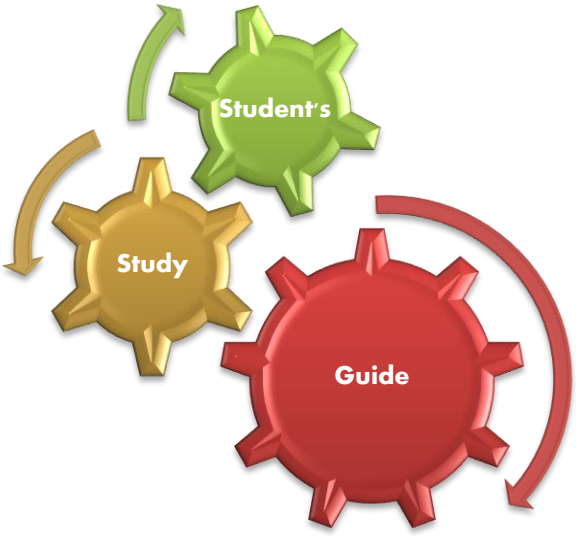
Industrial Training

Industrial Training is a MUST to all students under Diploma Program. Students must pass industrial training before being recommended for the graduates of Diploma in Polytechnic, Ministry of Higher Education.

*Please refer to Industrial Training and Liaison Unit for further information.

REFFERENCES

1. *Buku Panduan dan Peraturan AM Pelajar Politeknik, Jabatan Pengajian Politeknik.*
2. *Arahan-arahan Peperiksaan dan Kaedah Penilaian.*
3. *Garis Panduan Kecemerlangan Sistem Penasihatan Akademik Politeknik, Jabatan Pengajian Politeknik.*
4. *Garis Panduan Pengurusan dan Kaedah Penilaian Latihan Industri Politeknik, Jabatan Pengajian Politeknik.*



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