



KEMENTERIAN PENDIDIKAN TINGGI



STUDENT STUDY GUIDE

Diploma in Civil Engineering (DCE)

(Edition: Curriculum Effective June 2019)

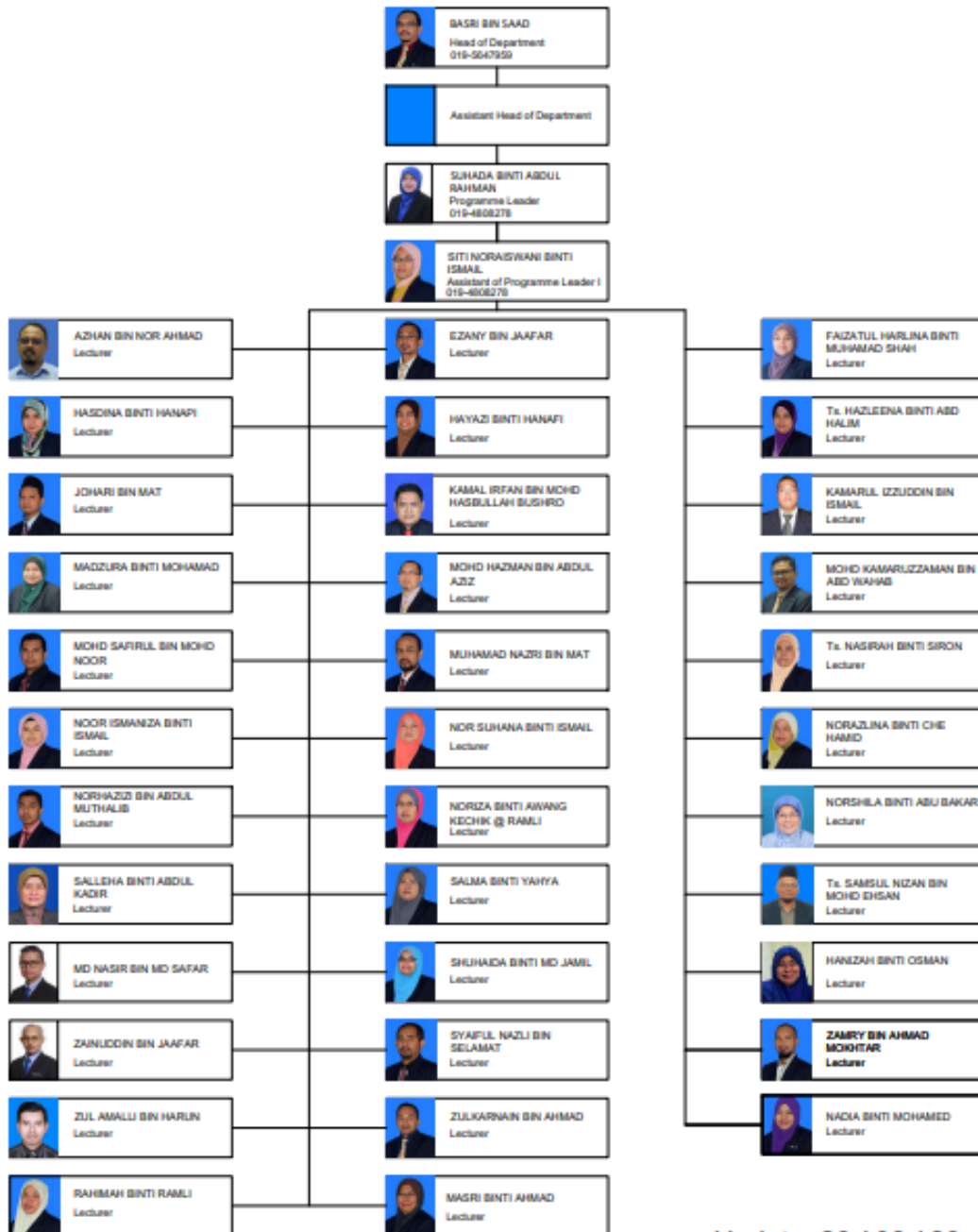


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The organisational chart of Civil Engineering Programme

ORGANIZATION CHART
DEPARTMENT OF CIVIL ENGINEERING
POLITEKNIK SULTAN ABDUL HALIM MU'ADZAM SHAH

CIVIL ENGINEERING UNIT



Update: 20 / 08 / 23

Checklist of courses for Diploma in Civil Engineering

SEM	COURSE CODE	COURSE	TICK (✓)	REMARK
Semester 1	DUE10012	Communicative English 1	<input type="checkbox"/>	
	MPU21032	Penghayatan Etika dan Peradaban	<input type="checkbox"/>	
	MPU24XX1	Sukan	<input type="checkbox"/>	
	MPU24XX1	Unit Beruniform 1	<input type="checkbox"/>	
	DUW10022	Occupational, Safety & Health for Engineering	<input type="checkbox"/>	
	DBM10013	Engineering Mathematics 1	<input type="checkbox"/>	
	DBS10012	Engineering Science	<input type="checkbox"/>	
	DCC10012	Engineering Drawing and Computer Aided Drafting (CAD)	<input type="checkbox"/>	
	DCC10022	Brickworks and Concrete Laboratory	<input type="checkbox"/>	
DCC10032	Civil Engineering Material	<input type="checkbox"/>		
Semester 2	MPU23052	Sains, Teknologi dan Kejuruteraan Dalam Islam*	<input type="checkbox"/>	
	MPU23042	Nilai Masyarakat Malaysia**	<input type="checkbox"/>	
	MPU24XX1	Kelab/Persatuan	<input type="checkbox"/>	
	MPU24XX1	Unit Beruniform 2	<input type="checkbox"/>	
	DBM20023	Engineering Mathematics 2	<input type="checkbox"/>	
	DCC20042	Plumbing and Carpentry Workshop	<input type="checkbox"/>	
	DCC20053	Mechanic of Civil Engineering Structure	<input type="checkbox"/>	
	DCC20063	Engineering Survey	<input type="checkbox"/>	
DCC20073	Contract and Estimating	<input type="checkbox"/>		
Semester 3	DUE30022	Communicative English 2	<input type="checkbox"/>	
	MPU22012	Entrepreneurship	<input type="checkbox"/>	
	DCC30082	Industrialised Building System (IBS) in Sustainable Construction	<input type="checkbox"/>	
	DCC30093	Geotechnical Engineering	<input type="checkbox"/>	
	DCC30103	Highway and Traffic Engineering	<input type="checkbox"/>	
	DCC30112	Geotechnical and Highway Engineering Laboratory	<input type="checkbox"/>	
DCC30122	Fluids Mechanics	<input type="checkbox"/>		
Semester 4	DUE50032	Communicative English 3	<input type="checkbox"/>	
	DCC40132	Project Management and Practices	<input type="checkbox"/>	
	DCC40142	Steel Structure Design	<input type="checkbox"/>	
	DCC40152	Water Supply and Waste Water Engineering	<input type="checkbox"/>	
	DCC40163	Theory of Structures	<input type="checkbox"/>	
	DCC40172	Structure, Hydraulics and Water Quality Laboratory	<input type="checkbox"/>	
	DCC40181	Civil Engineering Project 1	<input type="checkbox"/>	
DCC50242	Building Information Modeling (BIM)	<input type="checkbox"/>		
Semester 5	DCC50194	Civil Engineering Project 2	<input type="checkbox"/>	
	DCC50203	Reinforced Concrete Design	<input type="checkbox"/>	
	DCC50212	Hydrology	<input type="checkbox"/>	
	DCC50222	Hydraulics	<input type="checkbox"/>	
	DCC50232	Engineering in Society	<input type="checkbox"/>	
DCC50252	Building Services	<input type="checkbox"/>		
Semester 6	DUT40110	Industrial Training	<input type="checkbox"/>	

1.0 History and background of polytechnic education

Ministry of Higher Education Malaysia (MOHE) aims to produce graduates at semi-professional level in engineering, commerce, hospitality, ICT and services, and provide alternative routes to education high, namely to public or private institutions for post-secondary students the Sijil Pelajaran Malaysia and Sijil Pelajaran Malaysia (Vocational) and graduates of polytechnics and colleges community. At the session of July 2015, there were 96069 students enrolled in the diploma programs and degree programs. MOHE polytechnics was first introduced in 1969 by the Colombo Plan with the establishment of the first polytechnic Polytechnic Ungku Omar, Ipoh. education polytechnics have enhanced and strengthened with the recommendation of the Committee The Cabinet reviewed the implementation of the Basic Education (1979), the Cabinet Committee About Exercise (1991) and the National Industrial Master Plan (1985-1995). so that now there are 30 polytechnics and Three polytechnics that are operating in the city across the country.

Reference : <http://www.politeknik.edu.my/international/about.asp>

2.0 History and background of Politeknik Sultan Abdul Halim Mu'adzam Shah (POLIMAS)

Politeknik Sultan Abdul Halim (POLIMAS) is located in Bandar Darulaman, Jitra, about 25 kilometers from Alor Setar, the state capital of Kedah. POLIMAS was established in February 1984. It was once known as the Polytechnic Alor Setar with the accessibility to the dormitory building of Sekolah Menengah Teknik Alor Setar.



The first group of students, approximately 120 students were admitted for study for the July session of 1984. POLIMAS aims to train students of SPM and SPMV certified to produce professional workforce in engineering and commerce. The campus is located in an area of 28 hectares in the district of Kubang Pasu. It was first operated on March 14, 1987 and was officially opened by His Royal Highness Tuanku Abdul Halim of Kedah on March 23, 1989. The name of Polytechnic Sultan Abdul Halim was named after His Royal Highness. POLIMAS has developed into an excellent educational institution and technical training practices. Student enrolment has increased to nearly 6,000 with the number of staff up to 600 people.

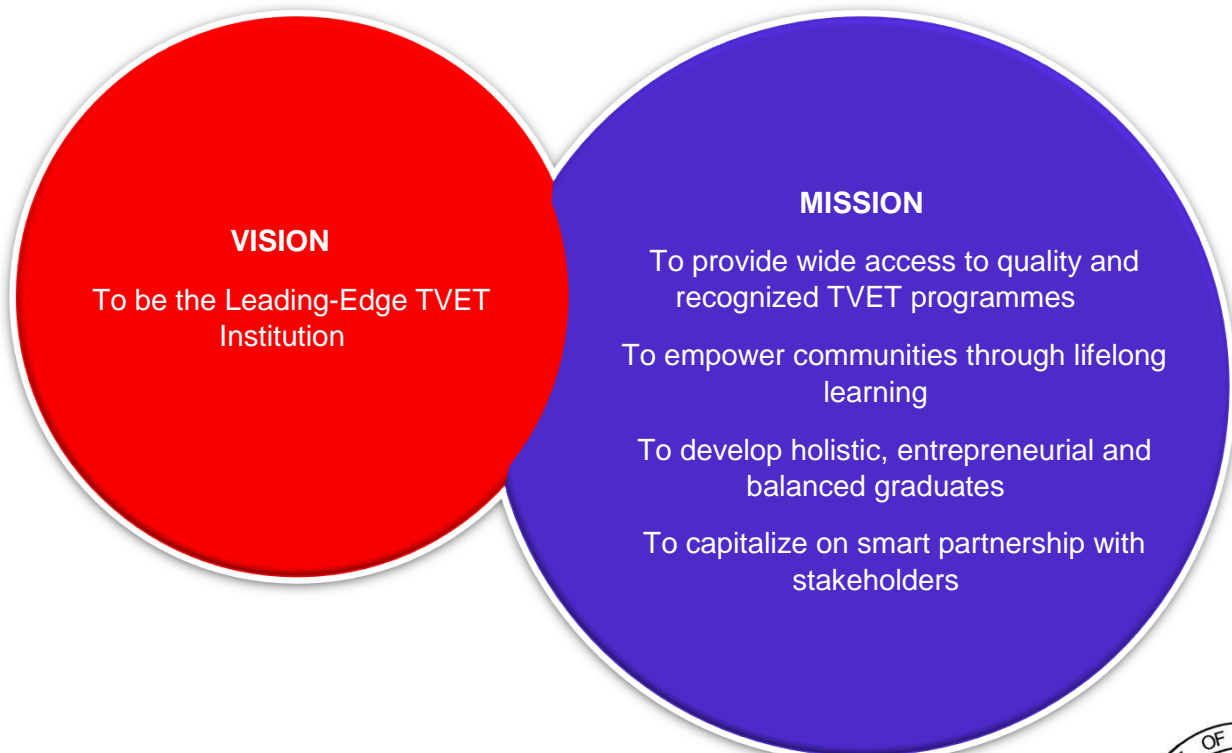
The first director of POLIMAS is Mr. Abdul Aziz bin Riza (retired) who has spearheaded POLIMAS for three years. The second director of POLIMAS is Tuan Haji Imran bin Idris, who has developed this institution for 12 years to become a leading institution in Malaysia. The third director of POLIMAS, Ir. Gan Chee Kuan (retired) have contribute much to the improvement POLIMAS throughout the 5 years. The fourth director of POLIMAS is Dr. Khair bin Mohamad Yusof while the fifth director is Mr. Mohd. Hashim bin Buyong who retired in July 2007. Then, POLIMAS is led by the sixth director Mr. Mohd Gomenon bin Su, also retired in May 2008.

POLIMAS is then led by Mr. Md Noor B. Baharom until November 2008, he was later replaced by Mr. Md. Nor Yusof as the eighth director of POLIMAS and then assumed the position as the Director General of the Department of Polytechnic Institutes, Ministry of Higher Education in October 2010. In July 2011, POLIMAS has been moving towards excellence with its ninth director, Tn. Hj. Kamaruzaman bin Ismail and continue having more achievement on tenth director, Pn. Asmara Binti Sulong until she retired on March 2017.

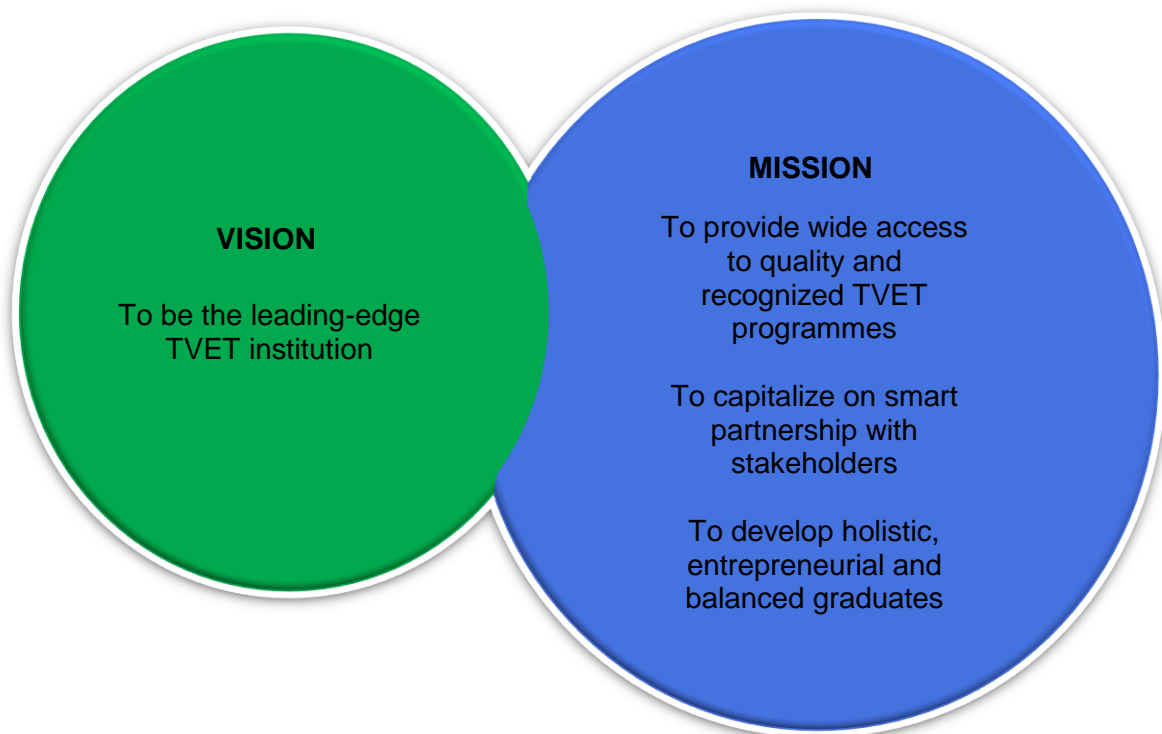
In July 2018, POLIMAS received its eleventh director, Mejar (K) Mohd Noor Bin Shahudin, AMK and then assume the position as Senior Director (Academic), JPPKK. In August 2021 POLIMAS received its twelfth director, Mr. Kamaludin Bin Daud and now assume the position as Deputy Director General (Governance), JPPKK, Ministry of Higher Education in March 2023. Currently, starting in April 2023 POLIMAS received its thirteenth director, Haji Rosli Bin Idris to realize the mission and vision of POLIMAS.

3.0 Vision and mission

3.1 Vision and mission of Department of Polytechnic Education (DPE)



3.2 Vision and mission of POLIMAS



4.0 Outcomes based education

OBE (Outcome-Based Education)

An educational method that focuses on what students can actually do after they are taught.

4.1 Key Purpose of OBE

WHAT IS OBE?

- OBE is short for Outcome-Based Education.
- Other names given to OBE:
 - Performance-Based Education
 - Mastery Learning
- OBE is a model of education that stresses on students' achievements in learning. In OBE students are required to demonstrate that they know and are able to do whatever the required outcomes are.
- OBE rejects the traditional focus on educational inputs and content and time allocation. Instead, it focuses on desired results.
- OBE emphasizes setting clear standards for observable, measurable outcomes through which student performance can be empirically measured.
- OBE addresses the following key questions:
 - i. What do you want the students to learn?
 - ii. Why do you want them to learn it?

- iii. How can you best help students learn it?
- iv. How will you know what they have learnt?
- v. How do you measure the attainment (close the loop)?
- Regarding the OBE paradigm, Spady (1994:8) states: “WHAT and WHETHER students learn successfully is more important than WHEN and HOW they learn something”.
- A good OBE approach should constitute the following:
 - Effective Program Educational Objectives (PAI)
 - Effective Program Learning Outcomes (PLOs)
 - Practical Assessment Tool (ATs)
 - Effective Assessment Planning
 - Robust Evaluation Planning
 - CQI procedures in place

4.2 OBE Principles

WHAT ARE PRINCIPLE OF OBE?

There are 4 principles of OBE:

- i. Clarity of Focus
Lecturers must be clearly focused on what they want the students to know, understand and be able to do/ demonstrate in achieving the ILOs.
- ii. Designing Down
The curriculum design must start with a clear definition of the intended outcomes that students are to achieve by the end of the programme.
- iii. High Expectations
Lecturers should establish high, challenging standards of performance in order to encourage students to engage deeply in what they are learning.
- iv. Expanded Opportunities
Provide multiple learning opportunities matching student’s needs with teaching techniques. Not all students can learn the same thing in the same time.

4.3 Relationship between curriculums, instruction & assessment

There are 3 inter-related of OBE:

- i. Curriculum – OBC (Outcome-Based Curriculum)
 - Polytechnics/ curricula are prepared by the Polytechnic Education Department MOHE.
 - OBC contents for Polytechnics:
 - Vision and Mission
 - Programme Aims (PAIs)
 - Programme Learning Outcomes (PLOs)
 - Course Learning Outcomes (CLOs)
 - Syllabus; Assessment Specification Table (ASTs); Matrices for Table of Learning Domain (TOLDs) for all courses; Student Learning Time (SLTs) for all courses.

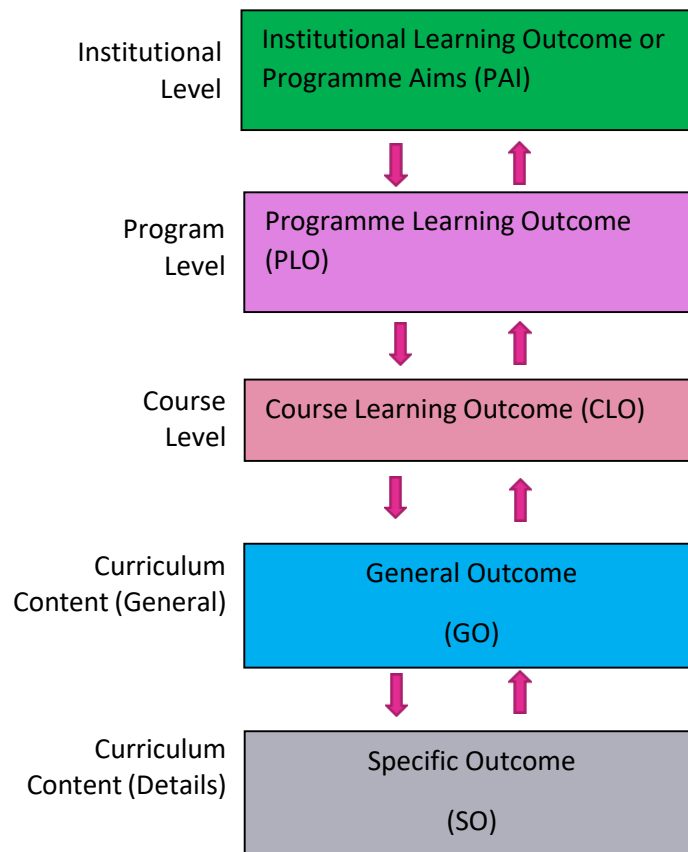
- ii. Instructional-OBTL (Outcome-Based Teaching & Learning)
 - OBTL engages students in the teaching and learning process. Lecturers should be able to apply appropriate modes of delivery to ensure students achieve the learning outcomes and to entrust them responsibility of their own learning process.
 - OBTL should be done in pursuit of fulfilling learning outcomes (LOs).
 - Lecturers need to plan and utilise appropriate teaching and learning activity (TLA) for each CLO, GO and SO.
 - Lecturers perform their function as facilitators. They must be able to make students take responsibility of their own learning.
 - Examples of TLAs in OBTL:
 - Interactive Lectures/Delivery
 - Discussion Group
 - Panel Discussion
 - Symposium/Seminar
 - Lecturer by Invite Expert/Professional Trainer
 - User-Based Computer Learning
 - Case Study
 - Problem-Based Learning
 - Role Play
 - Demonstration
 - Visits
- iii. Assessment – OBA (Outcome-Based Assessment)
 - OBA focuses on providing students with multiple opportunities to practice what they need to do in order to provide feedbacks on that practice (formative). Eventually, students must demonstrate achievement (summative) at the end of courses.
 - OBA measures/quantifies the level of achievement of students in meeting the desired outcomes of respective courses and thereafter programme.
 - OBA relies on assessment tasks (ATs) which consist of summative and formative assessments or criterion referred assessments.
 - Summative assessment – generally carried out at the end of a learning course/ programme (eg. Final exam). Summative assessments are typically used to assign students with course grades.
 - Formative assessment – generally carried out throughout a course in which feedbacks from the learning activities are used to improve the process of learning (eg. In tutorials, essays).
 - Criterion referred assessment – normally applied to evaluate the psychomotor of affective domains in learning process. Used for evaluating practical or hands-on activities (eg. Project, presentation, problem based assignment). Uses rubrics for assessments (see topic- What is a Rubric).

4.4 Learning outcomes the shift from teacher to students

WHAT IS LEARNING OUTCOME?

Learning Outcome (LO) is the focus in OBE approach of learning. Los are statements that specify the knowledge, skill, and abilities each individual student possesses and can demonstrate upon completion of a learning experience or sequence of learning experiences (e.g. course, programme of Los). Los are placed in every level of curriculum content. Los at each level are specifically for that level. Higher level Los are also linked to lower levels and vice-versa.

In OBE curricula. Los are hierarchical (top-bottom) and should map bottom-up to ensure the alignment of the curricula from institutional level down to the syllabi (see below).



4.5 Differences between learning system and OBE System

The statement in an LO made up of 3 components namely [action verb], condition and <standard>.

Examples of Los at various levels:

PAI	Graduates of Diploma in Mechanical Engineering programmes at Polytechnics will have knowledge, skill and attitude that enable them to make tangible contributions and meet new technical challenges. They will possess entrepreneurial skills, practice good work ethics, be able to promote good values and behaviour, and continuously enhance their knowledge and skills. They will be able to communicate and contribute effectively as a team. They will be able to adapt to new changes at their work place.
PLO	[Apply] knowledge of mathematics, science and engineering to <well defined mechanical engineering procedures and practices>.
CLO	[Communicate] ideas effectively by creating a presentation < using appropriate presentation tool> and publish it successfully through wed pages <using HTML tags>.
GO	[Develop] a presentation <using presentation package>.
SO	[Calculate] the beam deflection at the centre <within one decimal>.

Table 1 What are major differences between traditional education (TE) and OBE?

TE	VS	OBE
Content-based	<- >	Outcome-based
Measured output (% of passes)	<- >	Measure of achievement of Learning Outcomes
Technical skills	<- >	Incorporate technical and soft skills
Teacher-centred	<- >	Student-centred

5.0 Student Centred Learning (SCL)

SCL is Student-Centred Learning and is also known as:

- Flexible Learning
 - Independent Learning
 - Open/Distance Learning
 - Participative Learning
 - Self-Managed Learning
-
- As an analogy, if OBE is considered the system, the SCL is operating system for the system.
 - SCL focuses on how the students are learning, what they experience, and how they engage in the learning context.
 - SCL is a learning strategy that demands students to work both in groups and individuals to explore problems and become active knowledge workers rather than passive recipients of knowledge. Instead of the teacher being the gatekeeper of information, the (students construct their learning by actively seeking their own information)
 - In SCL students are responsible for planning the curriculum or at least they participate in its choosing. (The students is 100% responsible for his own behaviour, participation and learning)

Principles Of SCL

- The Student has full responsibility for his/her learning
- Involvement and participation are necessary for learning
- The relationship between students is more equal, promoting growth and development
- The lecturer becomes a facilitator and resource person
- The student experience confluence in his education (affective and cognitive domains flow together)
- The student sees him/herself differently as a result of the learning experience.

Table 2 Examples of SCL Method

INSIDE LECTURE	OUTSIDE OF THE LECTURE FORMAT
<ol style="list-style-type: none"> 1. Buzz group (short discussion in twos) 2. Pyramids/snowballing (Buzz groups continuing the discussion into larger groups) 3. Cross-overs (mixing students into groups by letter/number allocations) 4. Rounds (giving turns to individual students to talk) 5. Quizzes 6. Writing reflections on learning (3-4 minutes) 7. Role play 8. Students class presentation 9. Poster presentations 10. Mind mapping exercise in class 	<ol style="list-style-type: none"> 1. Independent projects 2. Group discussion 3. Peer mentoring of other students 4. Debates 5. Field-trips 6. Practical's 7. Reflective diaries, learning journals 8. Computer assisted learning 9. Writing articles 10. Portfolio development

6.0 Programme overview

6.1 Introduction

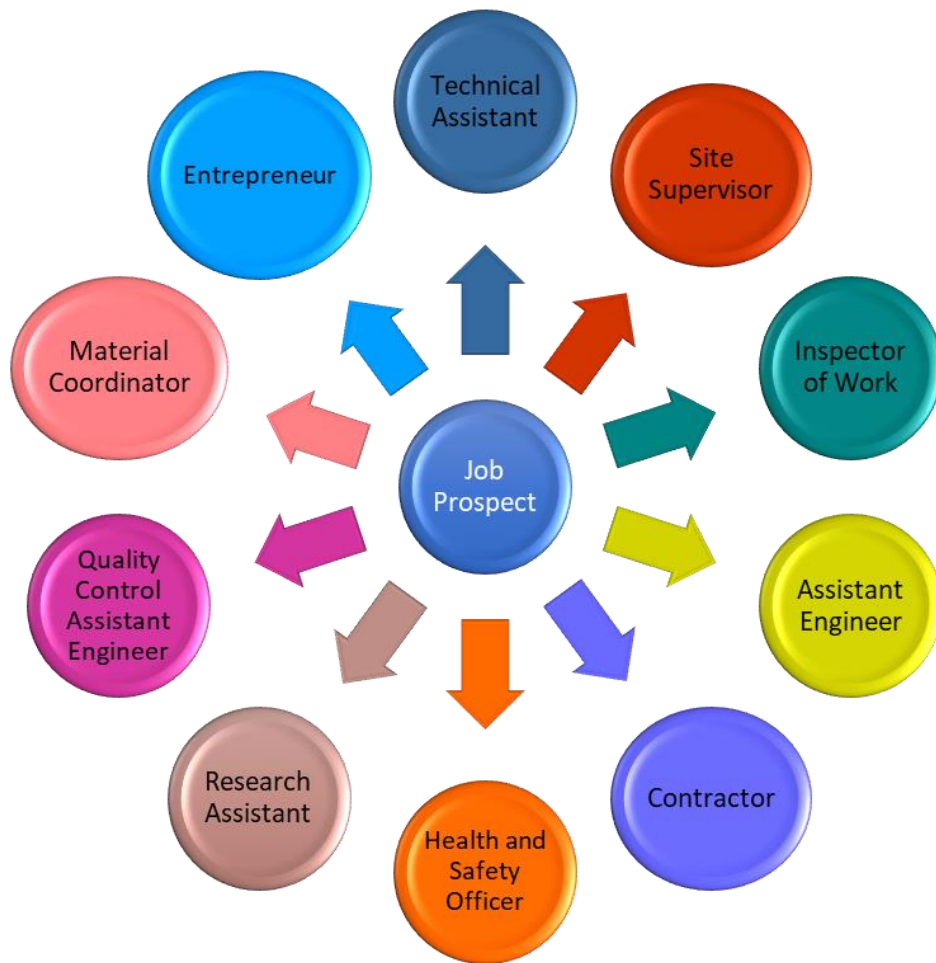
Diploma in Civil Engineering provides knowledge, skills and attitude to adapt to new technology in civil engineering with the ability to demonstrate professionalism and work ethics in fulfilling responsibilities towards the creator, client and society. This program provides theory as well as carry out practical work. This program also offers courses in Civil Engineering area such as Engineering Graphics, Water & Water Resources Engineering, Environment, Strength & Structural Design, Road & Transportation, Engineering Management and Geotechnics. This program is specially designed with hands-on training in addition to the theoretical learning in civil engineering. They are required to complete the 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, team work, 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.

6.2 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.

6.3 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:



6.4 Programme aims

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.

6.5 Programme educational objective (PEO)

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

- 1) working in the field of civil engineering
- 2) lead or a team member to support their role in industries
- 3) engaged in activities to enhance knowledge or starting/embark their own enterprise
- 4) fulfill professional and communities responsibilities, conforming to ethical and environmental values

6.6 Programme learning outcomes (PLO)

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

- 1) apply knowledge of applied mathematics, applied science, engineering fundamentals and an engineering specialization as specified in DK1 to DK4 respectively to wide practical procedures and practices
- 2) identify and analyse well-defined engineering problems reaching substantiated conclusions using codified methods of analysis specific to their field of activity (DK1 to DK4)
- 3) 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, cultural, societal, and environmental considerations (DK5)
- 4) conduct investigations of well-defined problems; locate and search relevant codes and catalogues, conduct standard tests and measurements
- 5) apply appropriate techniques, resources, and modern engineering and IT tools to well-defined engineering problems, with an awareness of the limitations (DK6)
- 6) demonstrate knowledge of the societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to engineering technician practice and solutions to well-defined engineering problems (DK7)
- 7) understand and evaluate the sustainability and impact of engineering technician work in the solution of well-defined engineering problems in societal and environmental contexts (DK7)
- 8) understand and commit to professional ethics and responsibilities and norms of technician practice
- 9) function effectively as an individual, and as a member in diverse technical teams
- 10) communicate effectively 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
- 11) demonstrate knowledge and understanding of engineering management principles and apply these to one's own work, as a member or leader in a technical team and to manage projects in multidisciplinary environments
- 12) recognize the need for, and have the ability to engage in independent updating in the context of specialized technical knowledge.

Notes:

DK1: A descriptive, formula-based understanding of the natural sciences applicable in a sub-discipline

DK2: Procedural mathematics, numerical analysis, statistics applicable in a subdiscipline

DK3: A coherent procedural formulation of engineering fundamentals required in an accepted sub-discipline

DK4: Engineering specialist knowledge that provides the body of knowledge for an accepted sub-discipline

DK5: Knowledge that supports engineering design based on the techniques and procedures of a practice area

DK6: Codified practical engineering knowledge in recognised practice area.

DK7: Knowledge of issues and approaches in engineering technician practice ethics, financial, cultural, environmental and sustainability impacts

7.0 Programme structure for Diploma in Civil Engineering

CLASSIFICATION	COURSE CODE	COURSE NAME	CONTACT HOURS				CREDIT VALUES	PROGRAM LEARNING OUTCOME (PLO)												PRE - REQUISITE / CO - REQUISITE
			L	P	T	O		PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8	PLO 9	PLO 10	PLO 11	PLO 12	
								Knowledge	Problem Analysis	Design/ Development Solution	Investigation	Modern Tool Usage	The Engineer And Society	Environment and Sustainability	Ethics	Individual and Team Work	Communications	Project Management and Finance	Life Long Learning	
CLS1	CLS2	CLS2	CLS2	CLS3a	CLS3c	CLS3b	CLS5	CLS5	CLS3d	CLS3b	CLS4	CLS4								
SEMESTER 1																				
Compulsory	MPU21032	Penghayatan Etika dan Peradaban	1	0	2	0	2											√		
	DUE10012	Communicative English 1	1	0	2	0	2												√	
	MPU24XX1	Sukan ***																	√	
	MPU24XX1	Unit Beruniform 1 ***	0	2	0	0	1												√	
Common Core	DUW10022	Occupational, Safety & Health for Engineering	2	0	0	0	2												√	
	DBS10012	Engineering Science	2	1	0	0	2				√								√	
	DBM10013	Engineering Mathematics 1	2	0	2	0	3				√								√	
Discipline Core	DCC10012	Engineering Drawing and Computer Aided Drafting (CAD)	0	4	0	0	2												√	
	DCC10022	Brickworks and Concrete Laboratory	0	3	0	0	2												√	
	DCC10032	Civil Engineering Materials	2	0	0	0	2												√	
TOTAL			26				18													
SEMESTER 2																				
Compulsory	MPU23052	Sains, Teknologi dan Kejuruteraan Dalam Islam*	1	0	2	0	2												√	
	MPU23042	Nilai Masyarakat Malaysia**																	√	
	MPU24XX1	Kelab/Persatuan ***																	√	
	MPU24XX1	Unit Beruniform 2	0	2	0	0	1												√	
Common Core	DBM20023	Engineering Mathematics 2	2	0	2	0	3												√	
Discipline Core	DCC20042	Plumbing and Carpentry Workshop	0	3	0	0	2												√	
	DCC20053	Mechanics of Civil Engineering Structure	3	0	1	0	3				√								√	
	DCC20063	Engineering Survey	2	3	0	0	3												√	
	DCC20073	Contract and Estimating	3	0	1	0	3												√	
TOTAL			25				17													
SEMESTER 3																				
Compulsory	DUE30022	Communicative English 2	1	0	2	0	2												√	
	MPU22012	Entrepreneurship	1	0	2	0	2												√	
Discipline Core	DCC30082	Industrialised Building System (IBS) in Sustainable Constr	0	4	0	0	2												√	
	DCC30093	Geotechnical Engineering	3	0	1	0	3				√								√	
	DCC30103	Highway and Traffic Engineering	3	0	1	0	3				√								√	
	DCC30112	Geotechnical and Highway Engineering Laboratory	0	3	0	0	2												√	
	DCC30122	Fluids Mechanics	2	0	1	0	2				√								√	
TOTAL			24				16													
SEMESTER 4																				
Compulsory	DUE50032	Communicative English 3	1	0	2	0	2												√	
	DCC40132	Project Management and Practices	2	1	0	0	2												√	
Discipline Core	DCC40142	Steel Structure Design	2	1	0	0	2												√	
	DCC40152	Water Supply and Waste Water Engineering	2	0	1	0	2												√	
	DCC40163	Theory of Structures	3	0	1	0	3												√	
	DCC40172	Structure, Hydraulics and Water Quality Laboratory	0	3	0	0	2												√	
	DCC40181	Final Year Project 1	0	2	0	0	1												√	
Electives	Electives 1	0	4	0	0	2													√	
TOTAL			22				16													
SEMESTER 5																				
Discipline Core	DCC50194	Final Year Project 2	0	8	0	0	4												√	
	DCC50203	Reinforced Concrete Design	3	0	1	0	3												√	
	DCC50212	Hydrology	2	0	1	0	2												√	
	DCC50222	Hydraulics	2	0	1	0	2												√	
Electives	DCC50232	Engineering in Society	2	0	0	0	2												√	
	Electives 2	2	0	0	0	2													√	
TOTAL			26				15													
SEMESTER 6																				
Industrial Training	DUT600610	Industrial Training	0	0	0	0	10												√	
TOTAL			0				10													
TOTAL CREDIT VALUE			92				92													
ELECTIVE COURSE																				
1	DCC50242	Building Information Modeling (BIM)	0	4	0	0	2												√	
2	DCC50252	Building Services	2	0	0	0	2												√	
3	DCC50262	Environmental Pollution and Control	2	0	0	0	2												√	
FREE ELECTIVES																				
1	DUD10012	Design Thinking	1	0	0	1	2												√	

8.0 Courses synopsis and courses assessment

8.1 Course synopsis

SEM	COURSE	SYNOPSIS
1	DUE10012 COMMUNICATIVE ENGLISH 1	<p>COMMUNICATIVE ENGLISH 1 focuses on developing students' speaking skills to enable them to communicate effectively and confidently in group discussions and in a variety of social interactions. It is designed to provide students with appropriate reading skills to comprehend a variety of texts. The students are equipped with effective presentation skills as a preparation for academic and work purposes.</p> <p>CREDIT(S): 2 PREREQUISITE(S): NONE</p>
	MPU21032 PENGHAYATAN ETIKA DAN PERADABAN	<p>PENGHAYATAN ETIKA DAN PERADABAN ini menjelaskan tentang konsep etika daripada perspektif peradaban yang berbeza. Ia bertujuan bagi mengenal pasti sistem, tahap perkembangan, kemajuan dan kebudayaan merentas bangsa dalam mengukuhkan kesepaduan sosial. Selain itu, perbincangan dan perbahasan berkaitan isu-isu kontemporari dalam aspek ekonomi, politik, sosial, budaya dan alam sekitar daripada perspektif etika dan peradaban dapat melahirkan pelajar yang bermoral dan profesional. Penerapan amalan pendidikan berimpak tinggi (HIEPs) yang bersesuaian digunakan dalam penyampaian kursus ini.</p> <p>CREDIT(S): 2 PREREQUISITE(S): NONE</p>
	DBM10013 ENGINEERING MATHEMATICS 1	<p>ENGINEERING MATHEMATICS 1 exposes students to the basic algebra including resolve partial fractions. This course also covers the concept of trigonometry and the method to solve trigonometry problems by using basic identities, compound angle and double angle formulae. Students will be introduced to the theory of complex number and concept of vector and scalar. Students will explore advanced matrices involving 3x3 matrix.</p> <p>CREDIT(S): 3 PREREQUISITE(S): NONE</p>

SEM	COURSE	SYNOPSIS
	DBS10012 ENGINEERING SCIENCE	<p>ENGINEERING SCIENCE course introduces the physical concepts required in engineering disciplines. Students will learn the knowledge of fundamental physics in order to identify and solve engineering physics problems. Students will be able to perform experiments and activities to mastery physics concepts.</p> <p>CREDIT(S): 2 PREREQUISITE(S): NONE</p>
	DUW10022 OCCUPATIONAL, SAFETY & HEALTH FOR ENGINEERING	<p>OCCUPATIONAL SAFETY AND HEALTH FOR ENGINEERING course is designed to impart understanding of the self-regulatory concepts and provisions under the Occupational Safety & Health Act (OSHA). This course presents the responsibilities of workers in implementing and complying with the safety procedures at work. Understanding of notifications of accidents, dangerous occurrence, poisoning and diseases and liability for offences will be imparted upon students. This course will also provide an understanding of the key issues in OSH Management, Incident Prevention, Fire Safety, Hazard Identification Risk Control and Risk Assessment (HIRARC), Workplace Environment and Ergonomics and guide the students gradually into this multi-disciplinary science.</p> <p>CREDIT(S): 2 PREREQUISITE(S): NONE</p>
	DCC10012 ENGINEERING DRAWING AND COMPUTER AIDED DRAFTING (CAD)	<p>ENGINEERING DRAWING & COMPUTER AIDED DRAFTING (CAD) covers the basic manual drafting of technical drawing to enhance engineering student ability to communicate ideas in modern technology industry. It provides a platform for student to interpret engineering drawings, use CAD and develop their skills in technical sketching. Student should be able to produce engineering drawing using manual graphics sketching and CAD software related to IR4.0.</p> <p>CREDIT(S): 2 PREREQUISITE(S): NONE</p>

SEM	COURSE	SYNOPSIS
	DCC10022 BRICKWORKS AND CONCRETE LABORATORY	<p>BRICKWORKS AND CONCRETE LABORATORY covers a basic concept of practical works and principles regarding the brickworks and concrete works including the safety exposure in workshop. This course emphasizes the related brick laying using mortar mixing 1:3 and student needed to complete a selected mini project. As for concrete works the method of statement for concrete which referred is BS1881. The cement to be used throughout the work shall be Portland cement obtained from an approved manufacturer that comply with MS 522. Fine and coarse aggregates shall comply with MS 29. All testing specification were referred by MS EN 206. This course also needs students to participate actively in teamwork during the practical activities.</p> <p>CREDIT(S): 2 PREREQUISITE(S): NONE</p>
	DCC10032 CIVIL ENGINEERING MATERIAL	<p>CIVIL ENGINEERING MATERIALS course is designed to equip students with a comprehensive knowledge and skills related to construction materials used in civil engineering. It will emphasize on types and function of cement, the function of aggregates in concrete, water, admixtures, properties of fresh and hardened concrete, concrete mix design, and manufacturing concrete on site. This course also focuses on the properties of timber, types and characteristics of brick and concrete block, steel and non-steel, the types and function of building finishes materials and the introduction to building elements.</p> <p>CREDIT(S): 2 PREREQUISITE(S): NONE</p>
2	MPU23052 SAINS, TEKNOLOGI DAN KEJURUTERAAN DALAM ISLAM	<p>SAINS, TEKNOLOGI DAN KEJURUTERAAN DALAM ISLAM memberi pengetahuan tentang konsep Islam sebagai al-Din dan seterusnya membincangkan konsep sains, teknologi dan kejuruteraan dalam Islam serta impaknya, pencapaiannya dalam tamadun Islam, prinsip serta peranan syariah dan etika Islam, peranan kaedah fiqh serta aplikasinya.</p> <p>CREDIT(S): 2 PREREQUISITE(S): NONE</p>

SEM	COURSE	SYNOPSIS
	MPU23042 NILAI MASYARAKAT MALAYSIA	NILAI MASYARAKAT MALAYSIA membincangkan aspek sejarah pembentukan masyarakat, nilai-nilai agama, adat resam dan budaya masyarakat di Malaysia. Selain itu, pelajar dapat mempelajari tanggungjawab sebagai individu dan nilai perpaduan dalam kehidupan di samping cabaran- cabaran dalam membentuk masyarakat Malaysia. CREDIT(S): 2 PREREQUISITE(S): NONE
	DBM20023 ENGINEERING MATHEMATICS 2	ENGINEERING MATHEMATICS 2 exposes students to the basic laws of indices and logarithms. This course introduces the basic rules of differentiation concepts to solve problems that relates maximum, minimum and calculate the rates of changes. This course discusses integration concepts in order to strengthen student's knowledge for solving area and volume bounded region problems. In addition, students will learn application of both techniques of differentiation and integration. CREDIT(S): 3 PREREQUISITE(S): DBM10013 - ENGINEERING MATHEMATICS 1
	DCC20042 PLUMBING AND CARPENTRY WORKSHOP	PLUMBING AND CARPENTRY WORKSHOP covers basic practical works of plumbing and carpentry works. This course emphasizes the related materials used and active participation of student to produce simple project. CREDIT(S): 2 PREREQUISITE(S): NONE
	DCC20053 MECHANIC OF CIVIL ENGINEERING STRUCTURE	MECHANICS OF CIVIL ENGINEERING STRUCTURES covers knowledge of facts and basic principles of types of forces, strength of materials and behaviour of loaded structures. This course provides exposure to the impact of loaded structures on direct and shear stresses, slope and deflection. This exposure will be the pre requisite to understand other courses in Civil Engineering. CREDIT(S): 3 PREREQUISITE(S): NONE

SEM	COURSE	SYNOPSIS
	DCC20063 ENGINEERING SURVEY	<p>ENGINEERING SURVEY focus on the basic principles of levelling and total station traverse survey. This course emphasizes the basic distance measurement, bearing and angle in order to get the shape of terrain and the position on the field. It also gives knowledge and practical skills to students in operating and handling survey instruments, control survey, detail survey, data collection or acquisition, calculation and plotting of survey works. The course emphasis on the method used to carry out surveying works especially data collection or acquisition to produce plan based on the scope of work. It also gives exposure to the need for accurate data to be used for other surveying work.</p> <p>CREDIT(S): 3 PREREQUISITE(S): NONE</p>
	DCC20073 CONTRACT AND ESTIMATING	<p>CONTRACT AND ESTIMATING is a study of construction industry in general, tender procedure, contract procedure, preliminary estimating method, build-up rate and quantity measurement. The module emphasizes on contract condition and provide exposure to the students regarding the procedures and standard practice in the construction field based on Standard Form of Contract (P.W.D. Form 203/203A).</p> <p>CREDIT(S): 3 PREREQUISITE(S): NONE</p>
3	DUE30022 COMMUNICATIVE ENGLISH 2	<p>COMMUNICATIVE ENGLISH 2 emphasises the skills required at the workplace to describe products or services as well as processes or procedures. This course will also enable students to make and reply to enquiries and complaints.</p> <p>CREDIT(S): 2 PREREQUISITE(S): DUE10012 - COMMUNICATIVE ENGLISH 1</p>
	MPU22012 ENTREPRENEURSHIP	<p>ENTREPRENEURSHIP focuses on the fundamentals and concept of entrepreneurship in order to inculcate the value and interest in students to choose entrepreneurship as a career. This course can help students to initiate creative and innovative entrepreneurial ideas. It also emphasizes a preparation of a business plan framework through business model canvas.</p> <p>CREDIT(S): 2 PREREQUISITE(S): DUE10012 - NONE</p>

SEM	COURSE	SYNOPSIS
	DCC30082 INDUSTRIALISED BUILDING SYSTEM (IBS) IN SUSTAINABLE CONSTRUCTION	<p>IBS IN SUSTAINABLE CONSTRUCTION is designed to equip student the concept of Industrialised Building System (IBS) in conjunction with sustainability of the construction industry. This course teaches on elements such as Modular Coordination and IBS Score, site management and supervision and installation of IBS components. This course will also include practical work in assembling green system, supervision and quality checking in IBS construction and also installation of IBS in a small scale project pertaining to sustainable construction.</p> <p>CREDIT(S): 2 PREREQUISITE(S): NONE</p>
	DCC30093 GEOTECHNICAL ENGINEERING	<p>GEOTECHNICAL ENGINEERING covers basic knowledge of the process of soils and rock formation and the characteristics of soil. It also covers soil improvement works such as compaction, shear strength, seepage, slope stability, earth pressure and foundation.</p> <p>CREDIT(S): 3 PREREQUISITE(S): NONE</p>
	DCC30103 HIGHWAY AND TRAFFIC ENGINEERING	<p>HIGHWAY AND TRAFFIC ENGINEERING is a study on history of highway construction and the organization involved in Malaysia. This course also provides the students with the knowledge regarding the method and design involved in traffic engineering. This course emphasizes on introduction to highway and traffic, pavement materials, construction of flexible pavement, construction of rigid pavement, traffic control equipment and road furniture, flexible pavement design, junction design, traffic management and highway maintenance.</p> <p>CREDIT(S): 3 PREREQUISITE(S): NONE</p>
	DCC30112 GEOTECHNICAL AND HIGHWAY ENGINEERING LABORATORY	<p>GEOTECHNICAL AND HIGHWAY 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 geotechnical and highway which are the core of the civil engineering field.</p>

SEM	COURSE	SYNOPSIS
		CREDIT(S): 2 PREREQUISITE(S): NONE
	DCC30122 FLUIDS MECHANICS	FLUID MECHANICS covers the behaviour and characteristics of engineering fluid and their application in hydrostatic and hydrodynamic fluid. 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. CREDIT(S): 2 PREREQUISITE(S): NONE
4	DUE50032 COMMUNICATIVE ENGLISH 3	COMMUNICATIVE ENGLISH 3 aims to develop the necessary skills in students to analyse and interpret graphs and charts from data collected as well as to apply the job hunting mechanics effectively in their related fields. Students will learn to gather data and present them through the use of graphs and charts. Students will also learn basics of job hunting mechanics which include using various job search strategies, making enquiries, and preparing relevant resumes and cover letters. The students will develop communication skills to introduce themselves, highlight their strengths and abilities, present ideas, express opinions and respond appropriately during job interviews. CREDIT(S): 2 PREREQUISITE(S): DUE30022 - COMMUNICATIVE ENGLISH 2
	DCC40132 PROJECT MANAGEMENT AND PRACTICES	PROJECT MANAGEMENT AND PRACTICES focuses on the basic knowledge and understanding of project management. Students will be introduced to the definition and basic concept of project management and practices. . Every aspect in project management is explained starting from the overview of project management, the influences of organizational structures in project management, project lifecycle, resources in project management, planning and scheduling, project control and monitoring, safety control, environmental management plan and quality assurance in project management. The application of common software such as Microsoft Project for planning and scheduling also will be exposed to the student. CREDIT(S): 2 PREREQUISITE(S): NONE

SEM	COURSE	SYNOPSIS
	DCC40142 STEEL STRUCTURE DESIGN	<p>STEEL STRUCTURE DESIGN covers the fundamental concepts and basic principles required to design steel structures including beam, column, roof truss and connections. This course enables student to develop understanding basic knowledge related to the theoretical background for the design of steel structures and the practical expertise to translate this background knowledge into successfully performing actual design calculations according to Eurocode 3 (EC3) for a single storey steel building.</p> <p>CREDIT(S): 2 PREREQUISITE(S): DCC20053 - MECHANICS OF CIVIL ENGINEERING STRUCTURE</p>
	DCC40152 WATER SUPPLY AND WASTE WATER ENGINEERING	<p>WATER & WASTE WATER ENGINEERING 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 emphasize on the parameter of drinking water and effluent from sewage treatment plant.</p> <p>CREDIT(S): 2 PREREQUISITE(S): NONE</p>
	DCC40163 THEORY OF STRUCTURES	<p>THEORY OF STRUCTURE covers basic knowledge of facts and principles in calculate the reactions, bending moments and shear forces for statically indeterminate beams and portal frame using the slope deflection method and moment distribution method. It also includes basic principles in analyse the forces in truss members using the equilibrium joint method for the statically determinate and using unit load method for the statically indeterminate trusses. Influence lines have important application for the design of structures that resist large live loads. Evaluation in influence lines include determination of shear force, bending moment and the absolute maximum moment.</p> <p>CREDIT(S): 3 PREREQUISITE(S): DCC20053 - MECHANICS OF CIVIL ENGINEERING STRUCTURE</p>

SEM	COURSE	SYNOPSIS
	DCC40172 STRUCTURE, HYDRAULICS AND WATER QUALITY LABORATORY	<p>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.</p> <p>CREDIT(S): 2 PREREQUISITE(S): NONE</p>
	DCC40181 CIVIL ENGINEERING PROJECT 1	<p>FINAL YEAR PROJECT 1 covers the knowledge and displays practice skills in civil engineering. The students are exposed to communication skills, group works, work planning, decision making and creativity using available facilities.</p> <p>CREDIT(S): 1 PREREQUISITE(S): NONE</p>
	DCC50242 BUILDING INFORMATION MODELING (BIM)	<p>BUILDING INFORMATION MODELLING (BIM) focuses on the designing and analysing building models using techniques, resources and BIM tools. Students will be introduced to building models using BIM process for architectural, structural and plumbing. It covers BIM coordination, clash detection and construction scheduling. This course is a project-based where students gain knowledge and skills on the implementation of BIM concepts from planning to design stage.</p> <p>CREDIT(S): 2 PREREQUISITE(S): NONE</p>
5	DCC50194 CIVIL ENGINEERING PROJECT 2	<p>FINAL YEAR PROJECT 2 covers knowledge and skills in civil engineering practices. The student will be exposed to communication skills, group works, work planning, decision making, recommendation and gain creativity by using related facilities to a design of a system. This course also covers conducting experiments in the laboratory/workshop, field works, and academic researches, designing product or method of civil engineering related fields. The student will learn the method to analyze data, prepare presentation and report writing.</p> <p>CREDIT(S): 4 PREREQUISITE(S): DCC40181 FINAL YEAR PROJECT 1</p>

SEM	COURSE	SYNOPSIS
	DCC50203 REINFORCED CONCRETE DESIGN	<p>REINFORCED CONCRETE DESIGN covers concepts and methods of design for reinforced concrete structures comprising beam and slab. This course emphasizes on knowledge and practice of producing double storey reinforced concrete building design starting from the layout plan, action analysis, structural design and detailing according to Eurocode 2 (EC2).</p> <p>CREDIT(S): 3 PREREQUISITE(S): DCC20053 - MECHANICS OF CIVIL ENGINEERING STRUCTURE</p>
	DCC50212 HYDROLOGY	<p>This course introduces students to the concepts of engineering hydrology including hydrologic cycle and rainfall runoff processes. It covers the quantification of rainfall and runoff processes for engineering design, including computation of design rainfalls, peak discharges and hydrographs. The basic concept of Urban Drainage Design and compliance with local guideline of Urban Storm Water Management Manual for Malaysia (MSMA) are discuss and employ in considering sustainability environmental value.</p> <p>CREDIT(S): 2 PREREQUISITE(S): NONE</p>
	DCC50222 HYDRAULICS	<p>HYDRAULICS covers the application in hydrostatic and hydrodynamic fluids. This course involves discussion on hydrostatics concept and basic equations of stability and buoyancy. This course also emphasize on the application of constituents of pumps and open channel flow concept appropriately in solving hydraulics problem.</p> <p>CREDIT(S): 2 PREREQUISITE(S): DCC30122 - FLUIDS MECHANICS</p>
	DCC50232 ENGINEERING IN SOCIETY	<p>ENGINEERING IN SOCIETY focuses on the introduction to the role of engineers in the context of their employment in industry and their interaction with the wider community. In this course, students will be exposed to safety and health of the public, technology and development in industry of civil engineering. This course also covers the meaning and impacts of engineering in society, ethical decision making, professional codes of ethics and sustainable development in the context of science and engineering application locally and globally. The students will be able to display excellent</p>

SEM	COURSE	SYNOPSIS
		<p>teamwork skills for working in group projects and organizing the activities of engineering practice in the society.</p> <p>CREDIT(S): 2 PREREQUISITE(S): NONE</p>
	DCC50252 BUILDING SERVICES	<p>BUILDING SERVICES focuses on the basic concepts and the principles of the systems in a building. The course emphasizes on the electrical installation system, fire prevention system, building transportation system, air conditioning system, maintenance works and the demolition works.</p> <p>CREDIT(S): 2 PREREQUISITE(S): NONE</p>
6	DUT40110 INDUSTRIAL TRAINING	<p>ENGINEERING INDUSTRIAL TRAINING course will provide student with first-hand experience in an engineering-practice environment outside the polytechnic. Student will practice their knowledge and skill based on knowledge learned in polytechnic through industry supervision to acquire the craft skill and essential. Student also need to demonstrate their responsibilities and professional ethic, communication, teamwork and inter-personal and life-long learning skills at the workplace.</p> <p>CREDIT(S): 10 PREREQUISITE(S): Fulfill the requirements of Industrial Training Guideline</p>

8.2 Course assessment

Course assessments that measures knowledge, practical skills and generic skill are carried out in the form of continuous assessment. Coursework assessments total score comprises and practical mark ONLY. It does not include the mark of generic skill.

8.3 Co-curriculum

PASUKAN BERUNIFORM

BIL	KOD KURSUS	PASUKAN BERUNIFORM
1	MPU24611, MPU24711	ASKAR WATANIAH
2	MPU24651, MPU24751	PISPA
3	MPU24661, MPU24761	PENGAKAP KELANA
4	MPU24691, MPU24791	RELASIS

MODUL/KELAB SUKAN

BIL	KOD KURSUS	SUKAN
1	MPU24011	BADMINTON
2	MPU24011	BOLA JARING
3	MPU24011	BOLA SEPAK
4	MPU24011	BOLA TAMPAR
5	MPU24011	HOKI
6	MPU24011	MEMANAH
7	MPU24011	RAGBI
8	MPU24011	SEPAK TAKRAW
9	MPU24011	SILAT
10	MPU24011	SOFBOL
11	MPU24011	TAEKWANDO
12	MPU24011	TENIS
13	MPU24011	FUTSAL
14	MPU24011	PETANQUE

KELAB & PERSATUAN

BIL	KOD KURSUS	KELAB & PERSATUAN
1	MPU24021	AMALAN 5S
2	MPU24021	BAHASA INGGERIS
3	MPU24021	LAYANG-LAYANG
4	MPU24021	MESRA ALAM
5	MPU24021	PENGGUNA
6	MPU24021	STUDY CIRCLE
7	MPU24021	TARIAN TRADISIONAL
8	MPU24021	TARANNUM

KELAB & PERSATUAN BUKAN AKADEMIK

BIL	KOD KURSUS	KELAB & PERSATUAN
1	KEBUDAYAAN	SENI LAKONAN TEATER

9.0 Editorial board

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