TABLE OF CONTENT

STUDENT PROGRAMME GUIDE
CIVIL ENGINEERING DEPARTMENT

DKA: DIPLOMA IN CIVIL ENGINEERING

DGU: DIPLOMA IN GEOMATIC

DSB: DIPLOMA IN ARCHITECTURE

CIVIL ENGINEERING DEPARTMENT
Politeknik Sultan Haji Ahmad Shah,
Semambu,
25350 Kuantan,
Pahang Darul Makmur.
Tel No: 09-5655300 Fax No: 09-5663104
Web: www.polisas.edu.my
Facebook: politeknik.edu

1.0 OVERVIEW OF THE INSTITUTION

POLISAS or Kuantan Polytechnic as it was formerly known was established in 1976 temporarily sharing the Kuantan Technical Institute premises in Alor Akar. It moved to its present 75 hectare campus in 1983 and was officially opened by His Majesty DYMM Sultan of Pahang on the 9th November 1985. On October 16, 2002 the 27.2 hectare Maktab Perguruan Tengku Ampuan Afzan Campus was given to POLISAS as the later was relocated to Kuala Lipis. This has resulted in the tremendous increase in student population from 120 in 1976 to more than 6,000 in 2010.

POLISAS was established with the objective of producing semi-professionals in various fields namely Civil Engineering, Mechanical Engineering, Electrical Engineering, Commerce and Food Technology to support the development of Malaysia. Since its inception, POLISAS has produced about 33,000 graduates in various fields of expertise.

Currently there are 14 diploma courses offered by 5 departments, POLISAS also offers part time courses to promote Life Long Learning among polytechnic graduates with certificate qualification, a change to pursue their diploma.

In line with the Polytechnic Transformation Plan, POLISAS has upgraded its facilities to provide conducive learning environment to the students. POLISAS also aims to achieve Excellent Academic Performance by providing excellent quality in education. This is proven when it was awarded the MS ISO 9001:2000 certification in January 2004 and then the MS ISO 9001:2008 in June 2009.

POLYTECHNIC POLICY

The National Education Philosophy

"Education in Malaysia is an on-going effort towards further developing the potential of individuals in a holistic and integrated manner, so as to produce individuals who are intellectually, spiritually, emotionally and physically balanced and harmonic based on a firm belief in and devotion to God. Such as effort is designed to produce Malaysian citizens who are knowledgeable and competent, who possess high moral standards and who are responsible and capable of achieving high level of personal well-being as well as being able to contribute to the harmony and betterment of the family, the society and the nation at large."

Our Vision

To be the **leading provider** of innovative human capital through transformational education and training to fulfil the needs of the global workforce.

Our Mission

To push the boundaries in building a **transformative and creative learning environmental** to generate an innovation-led economy.

Client's Charter

With full determination and a sense of responsibility, POLISAS promises to ensure:

1. The providing of semi-professional service meets the standard stated in the Quality Policy
2. A conducive learning environmental is met
3. An effective and competitive administration system to produce committed staff and well-rounded graduates
4. Certification is awarded within the stipulated timeframe and requirements
5. Semi-professional manpower is developed based on technology in line with me nation's vision.

2.0 INTRODUCTION TO THE DEPARTMENT OF CIVIL ENGINEERING

3.0 PROGRAMME OVERVIEW

DIPLOMA IN GEOMATIC – DGU

This programme provides students with knowledge and generates skill in the field of land survey especially on measurement and positioning technique, geospatial data capture, data processing, data analysis and map presentation. Among the courses offered in this programme is Cadastral Surveying, Survey Computation, Engineering Surveying Hydrographic Surveying, Utility Mapping, Geodesy, Astronomy, Survey Adjustment, CADD, Geographical Information System (GIS), Photogrammetry, Remote Sensing, Cartography, Land Law & Regulations, Land Management and Development, Town and Regional Planning and Visual Basic Programming. In addition to the technical courses, students are also taught Communicative English, Engineering Mathematics, Engineering Science, Pengajian Malaysia, Sains Teknologi dan Kejuruteraan Islam, Nilai Masyarakat Malaysia, Komunikasi dan Penyiaran Islam, Co-Curriculum, Occupational Safety and Health and Entrepreneurship to enhance their competencies in soft skills. The graduates from this programme will have the potentials to work in both private and government sector locally and abroad. In addition, they also have the opportunities to further their studies in other higher learning institutions locally and abroad

4.0 PROGRAMME AIMS

The Diploma in Geomatic graduates in Polytechnics, Ministry of Education will have knowledge, technical skills and attitude to adapt themselves with new technological advancement and challenges in geomatic fields.

5.0 ENTRY REQUIREMENTS

The general minimum requirement for student entry:

1) Malaysian

2) Passed “Sijil Pelajaran Malaysia” (SPM) or equivalent qualification with minimum requirement as follow:

   - Passed Bahasa Melayu
   - Passed English
   - Passed Sejarah (for SPM 2013 onwards)
   - Passed THREE (3) subject with minimum Grade C
     - ✓ Maths / Add Maths
     - ✓ ONE (1) Science / Technical / Vocational
     - ✓ ONE (1) any other subject

3) Candidates are not color blind and physically handicapped that will complicate practical assignments.

6.0 JOB PROSPECTS

This programme provides the knowledge and skills in geomatic and geospatial industry. The programme can also be applied to a broad range of careers available. The knowledge and skills that the students acquire from the program will enable them to participate in the job market such as:

- Assistant Surveyor
- Assistant Land Officer
- Land Survey Site Supervisor
- Land Survey Draughtsman
- Assistant Hydrographic Surveyor
- Assistant Information System Officer (GIS)
- Assistant Information System Officer (Remote Sensing)

DIPLOMA IN GEOMATIC (DGU)

7.0 DIPLOMA IN GEOMATIC - DGU

7.1 PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

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

1. Knowledgeable, technically competent in geomatic discipline and able to adapt themselves with new technological advancement and challenges in geomatic fields.
2. Effective in communication and social responsibilities, able to become a leader and work as a team.
3. Practicing good work ethics, able to promote good morality and behaviour and will continuously enhance their knowledge and skills.
4. Able to solve managerial and field problems and possess entrepreneur skills to prepare themselves for future challenges

7.2 PROGRAMME LEARNING OUTCOMES (PLO)

The Diploma in Geomatic programme shall produce semi-professionals who are able to:

1. Apply technical knowledge and social science/humanities knowledge to well defined land survey problems and to the personality development of an individual, respectively.
2. Demonstrate practical skills in utilising appropriate techniques and surveying instruments to well-defined surveying activities.
3. Communicate effectively with the related discipline in surveying field, engineering community and the society at large.
4. Solve related well-defined land survey problems systematically using appropriate tools and techniques.
5. Demonstrate awareness and consideration for societal, health, safety, legal and cultural issues and the consequent responsibilities.
6. Engage in independent acquisition of new knowledge and skill, and recognize the need for professional development and information management.
7. Demonstrate awareness in management, business practice and entrepreneurship.
8. Demonstrate understanding of professional ethics, responsibilities and norms of land survey practices.
9. Function individually or in teams, effectively, with the capability to be a leader.

7.3 MATRIX OF PROGRAMME EDUCATIONAL OBJECTIVES (PEO) VS PROGRAMME LEARNING OUTCOMES (PLO)

Programme Educational Objective (PEO):

The Diploma in Geomatic programme shall produce semi-professional that are:

PEO		PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9
		LD1	LD2	LD3	LD4	LD5	LD6	LD7	LD8	LD9
1.	Knowledgeable, technically competent in geomatic discipline and able to adapt themselves with new technological advancement and challenges in geomatic fields.	✓	✓							
2.	Effective in communication and social responsibilities, able to become a leader and work as a team.			✓		✓				✓
3.	Practicing good work ethics, able to promote good morality and behaviour and will continuously enhance their knowledge and skills.						✓		✓	
4.	Able to solve managerial and field problems and possess entrepreneur skills to prepare themselves for future challenges.				✓			✓		

Learning Domain

LDl Knowledge
LD2 Practical Skills
LD3 Communication Skills
LD4 Critical Thinking and Problem Solving Skills
LD5 Social Skills and Responsibilities
LD6 Continuous Learning and Information Management Skills
LD7 Management and Entrepreneurial Skills
LD8 Professionalism, Ethics and Moral
LD9 Leadership and Teamwork Skills

7.4 MATRIX OF COURSES VS PROGRAMME LEARNING OUTCOMES (PLO)

component	semester	course code	course	PLO 1 Knowledge	PLO 2 Practical Skills	PLO 3 Communication Skill	PLO 4 Critical Thinking / Problem Solving	PLO 5 Social Responsibility	PLO 6 Life-long learning / info management	PLO 7 Entrepreneurship	PLO 8 Professional Ethnics	PLO 9 Leadership / Teamwork Skills
Common Core	SEM 1	DUW1012	Occupational, Safety and Health	✓			✓				✓	
		DBM1013	Engineering Mathematics 1	✓								
		DBS1012	Engineering Science	✓	✓							
	SEM 2	DBM 2013	Engineering Mathematics 2	✓								
		DPB2012	Entrepreneurship	✓	✓	✓				✓		
	SEM 3	DBM 3013	Engineering mathematics 3	✓								
Discipline Core	SEM 1	DCG1012	Basic Surveying Computation	✓			✓					
		DCG1023	Basic Cadastral Surveying	✓	✓		✓					
	SEM 2	DCG2032	Surveying Computation	✓			✓					
		DCG2043	Engineering Surveying 1	✓	✓		✓					
		DCG2052	Cartography	✓	✓		✓					
		DCG2063	Field Astronomy	✓	✓		✓					
	SEM 3	DCG3143	Engineering Surveying 2	✓	✓		✓					
		DCG3073	Cadastral Surveying 1	✓	✓							✓
		DCG3083	Photogrammetry	✓	✓		✓					
		DCG3092	Land Laws & Regulations	✓		✓						
	SEM 5	DCG5243	Engineering Surveying 3	✓	✓							✓
		DCG5173	Cadastral Surveying 2	✓	✓						✓	
		DCG5103	Remote Sensing	✓	✓				✓			
		DCG5112	Hydrographic Surveying	✓								✓
		DCG5122	Geodesy 1	✓		✓						
	SEM 6	DCG6223	Geodesy 2	✓	✓							✓
		DCG6183	Geographical Information System	✓	✓		✓					
		DCG6192	Survey Adjustment	✓			✓					
		DCG6202	Land Management & Development	✓		✓						
		DCG6212	Utility Mapping	✓	✓							✓
		DCG6231	Survey Camp		✓							✓

Elective	SEM 6	DCG5132	Visual Basic Programming	✓	✓		✓					
		DCG5152	Topical Studies	✓	✓				✓			
		DCG5162	CADD	✓	✓		✓					
		DBC2012	Computer Application									
		DUF1XX2	Foreign Languange									
		DCG6252	Town and Country Planning	✓					✓			
		DCG6262	Cadastral Surveying in Sarawak & Sabah	✓	✓							✓
Industrial training	SEM 4	DUT 40110	Industrial Training		✓	✓					✓	✓

7.5 PROGRAMME STRUCTURE

COMPONENTS	COURSE CODE	COURSE	CONTACT HOURS			CREDIT HOURS
			L	P	T	
SEMESTER 1						
Compulsory	DUB1012	Pengajian Malaysia	1	0	2	2
	DUE1012	Communicative English 1	1	0	2	2
	DRBIXXO	Asas Unit Beruniform	0	2	0	0
Common Core	DUW1012	Occupational, Safety and Health	2	0	0	2
	DBM1013	Engineering Mathematics 1	2	0	2	3
	DBS1012	Engineering Science	2	1	0	2
Discipline Core	DCG1012	Basic Surveying Computation	2	0	0	2
	DCG1023	Basic Cadastral Surveying	2	3	0	3
		Total	**22**			**16**
SEMESTER 2						
Compulsory	DUA2012	Sains, Teknologi dan Kejuruteraan Dalam Islam *	1	0	2	2
	DUB2012	Nilai Masyarakat Malaysia **	1	0	2	2
	DRS2XX1	Sukan	0	2	0	1
	DRB2XX1	Unit Beruniform 1	0	2	0	1
Common Core	DBM2013	Engineering Mathematics 2	2	0	2	3
	DPB2012	Entrepreneurship	2	1	0	2
Discipline Core	DCG2032	Surveying Computation	2	0	0	2
	DCG2043	Engineering Surveying 1	2	3	0	3
	DCG2052	Cartography	1	2	0	2
	DCG2063	Field Astronomy	2	2	0	3
		Total	**25**			**18**
SEMESTER 3						
Compulsory	DUE3012	Communicative English 2	1	0	2	2
	DRK3XX2	Ke lab/P ersatuan	0	4	0	2
	DRB3XX2	Unit Beruniform 2	0	4	0	2
Common Core	DBM3013	Engineering Mathematics 3	2	0	2	3
Discipline Core	DCG3143	Engineering Surveying 2	2	3	0	3
	DCG3073	Cadastral Surveying 1	2	3	0	3
	DCG3083	Photogrammetry	2	3	0	3
	DCG3092	Land Laws & Regulations	2	0	0	2
		Total	**28**			**18**

COMPONENTS	COURSE CODE	COURSE	CONTACT HOURS			CREDIT HOURS
			L	P	T	
SEMESTER 4						
	DUT40110	Industrial Training	0	0	0	10
		Total	**0**			**10**
SEMESTER 5						
Compulsory	DUE5012	Communicative English 3	1	0	2	2
Discipline Core	DCG5243	Engineering Surveying 3	2	3	0	3
	DCG5173	Cadastral Surveying 2	2	3	0	3
	DCG5103	Remote Sensing	2	2	0	3
	DCG5112	Hydrographic Surveying	2	0	0	2
	DCG5122	Geodesy 1	2	0	0	2
Elective	DCG5132	Visual Basic Programming	1	2	0	2
	DCG5152	Topical Studies	1	2	0	2
	DCG5162	CADD	0	3	0	2
	DBC2012	Computer Application	1	2	0	2
	DUF1XX2	Foreign Languange	1	0	2	2
		Total	**24**			**17**
SEMESTER 6						
Compulsory	DUE3012	Communicative English 2	1	0	2	2
Discipline Core	DCG6223	Geodesy 2	2	3	0	3
	DCG6183	Geographical Information System	2	2	0	3
	DCG6192	Survey Adjustment	2	0	0	2
	DCG6202	Land Management & Development	2	0	0	2
	DCG6212	Utility Mapping	1	2	0	2
	DCG6231	Survey Camp	0	0	0	1
Elective	DCG6252	Town and Country Planning	2	**0**	**0**	2
	DCG6262	Cadastral Surveying in Sarawak & Sabah	1	3	**0**	2
		Total	**28**			**18**

	Total Credit	%
i. Compulsory	15	16%
ii. Common Core	15	16%
iii. Discipline Core	52	54%
iv. Elective	4	4%
V**.** Industrial Training	10	10%
TOTAL	**96**	**100%**

	Total	%
i. Lecture	59	49
ii. Practical (Practical + Tutorial)	61	51
iii. Contact Hours	120	-

Legend / Notes:

L : Lecture, **P** : Practical/Lab, **T** : Tutorial, **C** : Credit
(The numbers indicated under L, P & T represent the contact hours per week, to be used as a guide for timetable preparation)

Students are required to take a minimum of four credits of elective courses.
* For Muslim Students
** For Non-Muslim Students

For Co-curriculum,
1. Path 1: Sport and Club
2. Path 2: Uniform Unit

Uniform Unit (Students who choose Uniform Unit are required to complete 5 modules for commissioning)

1. DRBIXXO (Asas Unit Beruniform) is prerequisite to DRB2XX1 (Unit Beruniform)
2. DRB2XX1 and DRB3XX2 are graded
3. DRB5XX0 and DRB6XX0 are optional, non-graded and audited courses with full assessment. Upon completion, students are entitled for commissioning.

7.6 COURSE SYNOPSIS

SEMESTER 1

COURSE	SYNOPSIS	COURSE LEARNING OUTCOME (CLO)
DUB1012 PENGAJIAN MALAYSIA	**PENGAJIAN MALAYSIA** memupuk penghayatan ke arah melahirkan generasi yang cintakan negara. Kursus ini juga dapat mendidik kelompok masyarakat yang mempunyai daya juang yang tinggi dan mampu menghadapi cabaran di peringkat antarabangsa. Kursus ini memberi penghayatan tentang sejarah dan politik, perlembagaan Malaysia, kemasyarakatan dan perpaduan, pembangunan negara dan isu-isu keprihatinan negara. Objektif kursus ini adalah untuk melahirkan warganegara yang setia dan cintakan negara, berwawasan serta bangga menjadi rakyat Malaysia.	**CLO1:** Menerangkan dengan baik sejarahbangsa dan negara. (C2, LD1) **CLO2:** Menjelaskan Perlembagaan Malaysia dan sistem pemerintahan negara. (C2, LD1) **CLO3:** Melaksanakan aktiviti berkaitan kenegaraan ke arah peningkatan patriotisme pelajar. (C3, LD1 :A3,LD6)
DUE1012 COMMUNICATIVE ENGLISH 1	**COMMUNICATIVE ENGLISH 1** focuses on speaking skills for students to develop the ability 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. It is also aimed to equip students with effective presentation skills.	**CLO1:** Apply appropriate communication skills in discussions and conversations. (C3) **CLO2:** Comprehend selected texts using appropriate reading skills.(C2) **CLO3:** Interpret current issues / topic of interest in written form. (C2) **CLO4:** Apply effective presentation skills.(C3, A3)
DUW1012 OCCUPATIONAL, SAFETY AND HEALTH	**OCCUPATIONAL SAFETY AND HEALTH** 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 employers and employees in implementing and complying with the safety procedures at work. This course provide an understanding of the key issues in OSH management, incident prevention, Emergency Preparedness and Response (EPR), fire safety, occupational first aid, Hazard Identification, Risk Assessment and Risk Control (HIRARC) and guide the students gradually into this multi-disciplinary science.	**CLO1:** Identify the OSH legislation and its compliance in Malaysia. (C2, LD1) **CLO2:** Explain briefly incident hazards, risks and safe work practices in order to maintain health and safe work environment. (C2, LD1) **CLO3:** Discuss cooperatively in responding to an accident action at workplace. (C3,LD1; A2,LD4) **CLO4:** Adhere to the safety procedures in respective fields. (A3, LD8)
DBM1013 – ENGINEERING MATHEMATICS 1	**ENGINEERING MATHEMATICS 1** expose students to the basic algebra including perform partial fractions. This course also exposes the concept of trigonometry and the method to solve trigonometry problems by using basic identities, compound angle and double angle formulae. Students also will be introduced to the theory of complex number and matrices method to solve simultaneous equation. This course also introduces students to concept of vector and scalar.	**CLO1:** Identify mathematical methods in solving the mathematical problems. (C2, LD1) **CLO2:** Solve the mathematical problems by using appropriate techniques and solutions. (C3, LD1) **CLO3:** Practice mathematical knowledge and skills in different mathematics problem. (C3, LD1)
DBS1012 – ENGINEERING SCIENCE	**ENGINEERING SCIENCE** is an applied science with theoretical concepts and practical learning sessions that can be applied in the engineering fields. This course focuses on the Physical Quantities, Measurement, Linear Motion, Force, Work, Energy, Power, Solid, Fluid, Temperature and Heat.	**CLO1:** Solve the basic engineering science problems by using related concept. (C3, LD1) **CLO2:** Organise an appropriate experiments to prove related physic principles. (P3, LD2) **CLO3** Apply related physic principles

		in various situations to enhance knowledge. (C3, LD1)
DCG1023 – BASIC CADASTRAL SURVEYING	**BASIC CADASTRAL SURVEYING** provides students with the knowledge and understanding of the cadastral system in Malaysia and functions of related land agencies. Students are also exposed to cadastral equipment test/calibration and cadastral field work procedures according to Cadastral Survey Regulation and Circulars issued by the Department of Survey and Mapping Malaysia (JUPEM).	**CLO1:** explain the concept of cadastral survey and functions of related land and survey agencies according to individual government department. (C2,PLO1) **CLO2:** apply the concept of total station operation, datum selection and cadastral traverse according to Cadastral Survey Regulation. (C3, PLO1) **CLO3:** conduct total station setting up, differential field test, calibration and closed traverse according to Cadastral Survey Regulation. (P4, PLO2) **CLO4:** demonstrate the ability to solve datum selection according to Cadastral Survey Regulation. (A3,PLO4)
DCG1012 – BASIC SURVEYING COMPUTATION	**BASIC SURVEYING COMPUTATION** equips students with knowledge and understanding in problem solving related to the calculations of field survey.	**CLO1:** Calculate angle measurement and surveying triangles by using related methods. (C3, PLO1) **CLO2:** apply traverse adjustment to generate final coordinates by using related formula. (C3,PLO1) **CLO3:** demonstrate the ability to solve triangle, height and distance problems using trigonometrical concept . (A3,PLO4)
DRB1012 – ASAS UNIT BERUNIFORM	Memfokuskan kepada penguasaan pengetahuan dan kemahiran khusus secara holistik bagi mengukuhkan pembentukan kemahiran insaniah pelajar yang positif.	**CLO1:** Menunjukkan kemahiran khusus yang dipelajari. (P2: LD2). **CLO2:** Melaksanakan aktiviti-aktiviti berdasarkan penguasaan kemahiran yang dipelajari. (A2 : LD4, LD9)

SEMESTER 2

COURSE	SYNOPSIS	COURSE LEARNING OUTCOME (CLO)
DUA2012 SAINS TEKNOLOGI DAN KEJURUTERAAN DALAM ISLAM	**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.	**CLO1:** Menghuraikan konsep Islam sebagai cara hidup. (C2, LD1 : P2, LD2) **CLO2:** Menjelaskan konsep sains, teknologi dan kejuruteraan dalam Islam. (C2, LD1) **CLO3:** Membincangkan prinsip syariah dan kaedah fiqh dalam sains, teknologi dan kejuruteraan. (C3, LD1 : A3, LD6)
DUB2012 NILAI MASYARAKAT MALAYSIA	**NILAI MASYARAKAT MALAYSIA** membincangkan aspek sejarah pembentukan masyarakat Malaysia, nilai-nilai agama serta adat resam dan budaya masyarakat majmuk. Selain itu, pelajar diberi kefahaman mengenai tanggungjawab individu dalam kehidupan dan cabaran-cabaran dalam membangunkan masyarakat Malaysia.	**CLO1:** Menerangkan sejarah pembentukan masyarakat dan nilai agama di Malaysia. (C2 : LD1) **CLO2:** Menghubung kait tanggungjawab individu dalam kehidupan masyarakat dan negara. (C3 : LD1, A2 : LD5) **CLO3:** Membincangkan cabaran-cabaran dalam membangunkan

		masyarakat Malaysia. (C3 : LD1, A3 : LD6)
DBM2013 ENGINEERING MATHEMATICS 2	**ENGINEERING MATHEMATICS 2** exposes students to the basic laws of exponents and logarithms. This course also introduces the basic rules of differentiation concept to solve problems that relate maximum, minimum and calculate the rates of changes. This course also discuss integration concept in order to strengthen student knowledge for solving area and volume bounded region problems. In addition, students also will learn application of both techniques of differentiation and integration.	**CLO1:** Solve the mathematical problems by using appropriate mathematical techniques and solutions. (C3, LD1) **CLO2:** Show the solution for differentiation and integration problem by using appropriate method.(C3, LD1) **CLO3:** Practice mathematical knowledge and skills in different mathematics problem. (C3, LD1)
DCG2043 ENGINEERING SURVEYING 1	**ENGINEERING SURVEYING 1** provides basic knowledge in engineering surveying. The course emphasizes on angle and distance measurement, leveling, area and volume works. It also provides early exposure to students in practical work.	**CLO1:** apply the knowledge of basic land survey and its calculation in engineering surveying. (C3, PLO1)2. **CLO2:** perform perimeter survey and leveling works using related survey equipment according to survey regulation. (P4, PLO2) **CLO3:** demonstrate good communication skill in presentation individually or in group within stipulated time frame (A3, PLO3)
DCG2032 SURVEYING COMPUTATION	**SURVEYING COMPUTATION** equips students with knowledge in problem solving related to boundaries and land division such as in title survey which include calculation of missing data, three points and distance in field work.	**CLO1:** explain the concept of basic least square adjustments. (C2, PLO1) **CLO2:** apply the concept of field problems solution and trigonometry to solve boundaries and sub-division problems. (C3, PLO1) **CLO3:** demonstrate the ability to solve three points and distances problem by using related formula. (A3, PLO4)
DCG2025 CARTOGRAPHY	**CARTOGRAPHY** provides students with the knowledge on concept and basic principles on generating the map. The course provides the effect related to the map processing from the basic information aspect, collecting process and graphic info arrangement and also the production of map. This course exposes the students to the knowledge on how the map is being published the conventional method and new technology	**CLO1:** apply cartographical concept and methods used in mapping according to standard procedure. (C3,PLO1) **CLO2:** manipulate appropriate techniques to produce map by using digital cartography. (P4,PLO2) **CLO3:** Demonstrate the ability to solve related problems in cartographic equipment and software by using standard procedure. (A3,PLO4)
DCG2063 FIELD ASTRONOMY	**FIELD ASTRONOMY** equips students with knowledge on the position of celestial bodies such as the moon, sun, stars and planets with reference to earth. This study is important to land surveyors in field works such as determining the azimuth in land boundaries, checking angles in long traverse and determining geodetic positions or geographic points on earth.	**CLO1:** apply astronomical and falak syarie concept according to Department of Survey and Mapping Malaysia (JUPEM) and Department of Islamic Development Malaysia (JAKIM) using related formula. (C3,PLO1) **CLO2:** conduct solar observation for azimuth verification using extra meridian method. (P4,PLO2) **CLO3:** demonstrate the ability to solve qiblah direction and prayer time using related

		formula. (A3,PLO4)
DRS2001 SUKAN	**SUKAN** memfokuskan kepada penguasaan pengetahuan dan kemahiran khusus secara holistik bagi mengukuhkan pembentukan kemahiran insaniah pelajar yang positif.	**CLO1:** Mempamerkan kompetensi kemahiran khusus yang dipelajari. (PLO4) **CLO2:** Bekerjasama menganjurkan aktiviti berdasarkan penguasaan kemahiran yang dipelajari.
DRB2001 UNIT BERUNIFORM 1	**UNIT BERUNIFORM 1** memfokuskan kepada penguasaan pengetahuan dan kemahiran khusus secara holistik bagi mengukuhkan pembentukan kemahiran insaniah pelajar yang positif.	**CLO1:** Mempamerkan kompetensi kemahiran khusus yang dipelajari. (PLO4) **CLO2:** Bekerjasama menganjurkan aktiviti berdasarkan penguasaan kemahiran yang dipelajari.
DPB2012 ENTREPRENEURSHIP	**ENTREPRENEURSHIP** focuses the principles and concept of entrepreneurship. This course concentrates on the systematic methods of getting business ideas. This course also prepares the students on ways to conduct and control the business including fundamental of management, marketing and financing. It also emphasizes on the preparation of business plan, thus developing their entrepreneurial skills.	**CLO1:** Explain clearly the concept of entrepreneurship, process and procedures involved in developing effective business plan. (C2, LD1) **CLO2:** Work cooperatively in group to complete the assigned project based on entrepreneurial skills. (P3, LD2) (A3, LD7) **CLO3:** Present business plan creatively using knowledge gained via group. (A2, LD3)

SEMESTER 3

COURSE	SYNOPSIS	COURSE LEARNING OUTCOME (CLO)
DUE3012 COMMUNICATIVE ENGLISH 2	**COMMUNICATIVE ENGLISH 2** emphasises the skills required at the workplace to describe products or services as well as processes or procedures. It also focuses on the skills to give and respond to instructions. This course will also enable students to make and reply to enquiries and complaints.	**CLO1:** Describe products or services related to their field of studies using appropriate language. (C3, A3) **CLO2:** Transfer information on processes or procedures using appropriate language from non-linear to linear form. (C3) **CLO3:** listen and respond to enquiries using appropriate language.(C3) **CLO4:** make and respond to complaints using appropriate language.(C3)
DRK3002 KELAB / PERSATUAN	** Merujuk silibus asas unit beruniform yang ditawarkan mengikut Politeknik.	**CLO1:** Mempamerkan kompentensi kemahiran khusus yang dipelajari. (P3: LD2) **CLO2:** Mengorganisasikan aktiviti berdasarkan kemahiran-kemahiran yang dipelajari. (A3: LD4, LD9)
DRB3002 UNIT BERUNIFORM 2	** Merujuk silibus asas unit beruniform yang ditawarkan mengikut Politeknik.	**CLO1:** Mempamerkan penguasaan kemahiran insaniah yang dipelajari di dalam aktiviti. (P3 : LD2) **CLO2:** Mengaplikasikan aktiviti-aktiviti berdasarkan penguasaan kemahiran yang dipelajari. (A3 : LD4, LD9)
DBM3013 ENGINEERING MATHEMATICS 3	**ENGINEERING MATHEMATICS 3** exposes students to the statistical and probability concepts and their applications in	**CLO1:** solve the mathematical problems by using appropriate techniques and

	interpreting data. The course also introduces numerical methods concept to solve simultaneous equations by using Gaussian Elimination method, LU Decomposition using Doolittle and Crout methods, polynomial problems using Simple Fixed Point Iteration and Newton-Raphson methods. In additional, the course also discusses optimization problems by using Linear Programming. In order to strengthen the students in solving advanced engineering problems, Ordinary Differential Equation (ODE) is also included.	solutions.(C3, LD1) **CLO2:** Show the solution for statistics and probability problems, and linear programming by using appropriate mathematical methods. (C3, LD1). **CLO3:** Practice mathematical knowledge and skills in different mathematical problem. (C3, LD1)
DCG3143 ENGINEERING SURVEYING 2	**ENGINEERING SURVEYING 2** provides knowledge on Topographic survey, automation survey, calculation of volume using Mass Haul Diagram and concept Global Positioning System (GPS). It also emphasizes on detail surveying and GPS field work.	**CLO1:** apply the concept of topographic surveys, automation survey, positioning and earthwork volume. (C2, PLO1) **CLO2:** Calculate the earthwork volume by using Mass Haul Diagram. (C3, PLO1) **CLO3:** Perform topographic and positioning survey work by using Total Station and Global Navigation Satellite System (GNSS) equipment. (P4, PLO2) demonstrate the ability to produce topographic, longitudinal and cross section plan by automation software. (A3, PLO4)
DCG3073 CADASTRAL SURVEYING 1	**CADASTRAL SURVEYING 1** provides students with the knowledge on title survey, land development process and exposure to conduct cadastral works according to the latest regulations. It also emphasizes on problem solving and techniques of collecting data manually and Field To Finish (F2F) concept until the production of Certified Plan (CP).	**CLO1:** Apply the concept of cadastral survey work and land developments according to Cadastral Survey Regulation and National Land Code. (C3,PLO1) **CLO2:** Perform cadastral work with F2F concept according to the Department of Survey and Mapping Malaysia (JUPEM) or Department of Land and Survey Sarawak (JTSS) or Department of Land and Survey Sabah (JTUS) format. (P4,PLO2) **CLO3:** Demonstrate the ability to lead and work as a team to complete astronomical observation in cadastral work manually according to Cadastral Survey Regulation. (A3,PLO9)
DCG3092 LAND LAWS AND REGULATIONS	**LAND LAWS AND REGULATIONS** provides exposure and knowledge related to the legislative system which was used in land administration in Peninsular Malaysia before and after the introduction of the National Land Code and also the land administration system for Sabah and Sarawak. This course also explains land disposals, land dealing and transactions, Malay Reserve, Sabah and Sarawak Land Reserve and land acquisition by the State Authority. This knowledge is important in order to solve any problems related to land administration and management.	**CLO1:** Explain the National Land Code in Peninsular Malaysia and land administration in Sabah and Sarawak. (C2, PLO1) **CLO2:** apply the concept of Malay reserve in Peninsular Malaysia, land reserve in Sabah and Sarawak and land acquisition under Land Acquisition Act 1960 (Act 486). (C3,PLO1) **CLO3:** Demonstrate good communication skill in presentation individually / in group, on assigned topic(s)

		within a stipulated time frame. (A3, PLO3)
DCG3083 PHOTOGRAMMETRY	**PHOTOGRAMMETRY** equips students with knowledge regarding the principles, methods and equipment for aerial survey works. It is important to surveyor in solving problems related to aerial surveys. It also explains the principles and methods in conducting digital stereo mapping.	**CLO1:** Apply basic principles and concept in photogrammetry elements. (C3,PLO1) **CLO2:** Display appropriate techniques to conduct the stereoscopic viewing and digital photogrammetry. (P4, PLO2) **CLO3:** Demonstrate the ability to solve problems related to geometry aerial photo and flight planning. (A3, PLO4)

SEMESTER 4

COURSE	SYNOPSIS	COURSE LEARNING OUTCOME (CLO)
DUE5012 COMMUNICATIVE ENGLISH 3	**COMMUNICATIVE ENGLISH 3** aims to develop the necessary skills in students to carry out a mini project as well as job hunting. Students will learn to present ideas through the use of graphs and charts. Students will learn the process of job hunting which includes job search strategies and making enquiries. They will also learn to write resumes and cover letters. The students will develop skills to introduce themselves, highlight their strengths and abilities, present ideas, express opinions and respond appropriately during job interviews.	**CLO1**. Describe information contained in graphs and charts effectively. (C4, A3) **CLO2.** Apply job hunting mechanics appropriately. (C3) **CLO3.** Respond to interview questions using appropriate language when applying for jobs. (C3)
DCG5243 ENGINEERING SURVEYING 3	**ENGINEERING SURVEYING 3** provides knowledge on principles of engineering survey. The course emphasizes on the construction survey work, setting out in construction, curve alignment, monitoring survey and dimensional survey. It also exposes students to field works.	**CLO1:** apply the principles of engineering survey works correctly according to the latest standard (C3,PLO1) **CLO2:** Perform setting out, as-built survey and curve alignment in engineering works according to the latest standard. (P4,PLO2) **CLO3:** Demonstrate the ability to lead and work as a team in presenting final reports on monitoring survey. (A3,PLO9)
DCG5173 CADASTRAL SURVEYING 2	**CADASTRAL SURVEYING 2** provides students with the knowledge on cadastral system and cadastral electronic services. It emphasizes on the usage of Global Navigation Satellites System (GNSS) equipment for cadastral work via post processing and MyRTKnet environment. Besides, students are also exposed to strata, stratum title and professional practice as licensed surveyor.	**CLO1:** Apply the concept of several cadastral modules and professional bodies related to cadastral works according to Cadastral Survey Regulation and Licensed Land Surveyors Act 1958 (Amended 2011). (C3,PLO1) **CLO2:** Perform GNSS equipment test/calibration, cadastral survey work by post process and MyRTKnet method and strata title work according to Cadastral Survey Regulation. (C3,PLO2) **CLO3:** Demonstrate code of professional conduct of Licensed Land Surveyors according to License Land Surveyor Act 1958 (Amended 2011). (A3,PLO8)

		CLO4: Present business plan creatively using knowledge gained related to any land development in groups. (A2,PLO7)
DCG5103 REMOTE SENSING	**REMOTE SENSING** equips students with the knowledge of imagery concept. This course explains the concept of data capture from electromagnetic energy recording, by sensors brought by airplane or satellite. This course also develops student's skills in using software for digital image processing, digital image enhancement and image classification.	**CLO1:** Explain of the appropriate principles and theories to explain the concept of remote sensing. (C3, PLO1) **CLO2:** Perform image enhancement, image classification and map annotation using any computer software accurately (P4,PLO2) **CLO3:** Demonstrate the ability to show geometric correction and image enhancement using any computer software (A3,PLO6)
DCG5122 HYDROGRAPHIC SURVEYING	**HYDROGRAPHIC SURVEYING** provide students with the fundamental knowledge in hydrographic survey including the theory of tides, hydrographical survey planning, and techniques for positioning, sounding and charts production process.	**CLO1:** Explain the concept of hydrographic survey, function of hydrographic agencies, planning procedures, sounding and plans production process. (C2,PLO1) **CLO2:** Apply the concept of datum transfer, positioning and reduction of echo trace according to hydrographic standard. (C3,PLO1) **CLO3:** Demonstrate the ability to lead and work as a team in applying the most appropriate methods of positioning and sounding in hydrographic survey complying to the requirements of the clients and survey planning. (A3,PLO9)
DCG5122 GEODESY 1	**GEODESY 1** introduces students to the field related with geodesy and provides knowledge of the reference surface in geodesy, ellipsoidal geometry characteristics, datum in geodesy, geodesy coordinate system and computation on an ellipsoids	**CLO1:** Explain the geodetic concept in land surveying field. (C2,PLO1) **CLO2:** Apply the calculation to obtain the required data in Geodesy. (C3,PLO1) **CLO3:** Demonstrate good communication skill in oral presentation in group on assigned topic within as stipulated time frame. (A3,PLO3)
DCG5162 CADD for SURVEYOR	Computer Aided Design and Drafting for SURVEYORS **(CADD)** provides students with the knowledge and skill in producing cadastral and engineering survey plans with AutoCAD and relevant survey software according to a standard format.	**CLO1:** Apply technical knowledge and specific command in CADD software. (C3,PLO1) **CLO2:** Perform appropriate technique to download survey data for the production of cadastral and engineering plan according to standard format. (P4,PLO2) **CLO3:** Demonstrate related design skills in CADD to produce cadastral and engineering plans. (A3,PLO4)

SEMESTER 5

COURSE	SYNOPSIS	COURSE LEARNING OUTCOME (CLO)
DUA6022 KOMUNIKASI DAN PENYIARAN ISLAM	**KOMUNIKASI DAN PENYIARAN ISLAM** memfokuskan kepada penguasaan konsep, kemahiran komunikasi dan penyiaran Islam bagi meningkatkan kefahaman pelajar secara holistik terhadap kursus ini.	**CLO1:** Menjelaskan konsep komunikasi dan penyiaran dalam Islam. (C2 : LD1) **CLO2:** Menghubung kait isu-isu semasa dalam komunikasi Islam. (C3, A4 : LD1, LD5) **CLO3:** Menunjukkan kemahiran pengurusan dakwah dalam bidang penyiaran Islam. (C3, A3 : LD1, LD6)
DCG6223 GEODESY 2	**GEODESY 2** introduces students to gravity measurement and gravity data reduction on ellipsoid, precise levelling, GPS levelling method, height system in geodesy, up-to-date development of Malaysia geodetic network and positioning with GPS.	**CLO1:** Explain the geodetic survey work in Malaysia. (C3,PLO1) **CLO2:** Perform actively to conduct the control network in geodetic survey.(P4,PLO2) **CLO3:** Demonstrate ability to work in team to complete assigned tasks during practical work sessions. (A3,PLO9)
DCG6138 GEOGRAPHICAL INFORMATION SYSTEM (GIS)	**GEOGRAPHICAL INFORMATION SYSTEM (GIS)** emphasizes the utilization of computer software, databases, and survey technology via hands-on exercises in field data collection, input, conversion, analysis, map output and multimedia presentation. The knowledge and skills gained in these studies can be applied to work in various industrial sectors, including surveying, mapping, local and regional government, forestry, agriculture, town planning, military, health, business, education and the environment.	**CLO1:** Apply the concepts of GIS to develop Geographic Information System.(C3,PLO1) **CLO2:** Manipulate the technique of spatial analysis and GIS applications in various areas. (P4,PLO2) **CLO3:** Solve the problem by using appropriate technique in GIS software. (A5,PLO4)
DCG6192 SURVEY ADJUSTMENT	**SURVEY ADJUSTMENTS** provides the students with knowledge on adjustment. The course emphasizes the calculation of adjustment using the least square adjustment method by means of observation and condition equations in solving surveyed data. Besides, it's also provides students with knowledge and practical skills to calculate and adjust surveyed data.	**CLO1:** Explain the concept and principle of statistical sample and variance-covariance propagation in survey adjustment.(C2, PLO1) **CLO2:** Apply the least square adjustment in land survey data.(C3,PLO1) **CLO3:** Demonstrate good critical thinking and problem solving individually in classes during discussion sessions.(A3,PLO4)
DCG6202 LAND MANAGEMENT AND DEVELOPMENT	**LAND MANAGEMENT AND DEVELOPMENT** provides students with the exposure and knowledge related to land management and development in Malaysia. The module emphasizes on the land management and development under Strata Title Act 1985, nundergground land development, mining land development, land development under Group Settlement Area (GSA) and land development under National Land Code (NLC) 1965. Students are also exposed to planning aspects under Town and Country Planning Act 1976 (Act 172) and also Local Authority Act 1976 (Act 171).	**CLO1**: Explain the definition, concept and process of vertical development (strata), underground land development (stratum) correctly. (C2, PLO1) **CLO2**: Relate the land development based on Mineral Development Act 1994 and State Mineral Enactment, Group Settlement Area Act 1960 and National Land Code 1965 , Town and Country Planning Act 1976 specifically. (C3, PLO1) **CLO3:** Demonstrate good communication skills in presentation individually or in group on assign topic within stipulated time frame. (A3, PLO3)

DCG6212 UTILITY MAPPING	**UTILITY MAPPING** exposes the students to the definition, history, objectives, scope, method of survey, occupational safety and health, processing and mapping of underground utility mapping. These topics provide the student of the knowledge of field work such as determining the positions of underground materials on earth surface.	**CLO1:** Describe the history, utility quality level attributes of utility mapping, mapping utilities data and instruments used in underground detection survey precisely.(C2,PLO1) **CLO2:** Explain the method of survey for utility, occupational safety and health and processing utilities data. (C4,PLO1) **CLO3:** Conduct a control survey and utility mapping, processing of control and detail survey for utility mapping and utilities data collecting by different underground detection survey instruments (P4,PLO2)
DCG5132 VISUAL BASIC PROGRAMMING	**VISUAL BASIC PROGRAMMING** provides students with knowledge of the programming concepts using the visual basic programming language. The course emphasizes on design the programme which includes examining code, looping statement and also creates and document naming standard.	**CLO1:** Apply the concepts of visual basic programming to develop a standalone application programmes.(C3, PLO1) **CLO2:** builds a programme using the visual basic language.(C3,PLO1) **CLO3:** Demonstrate related design skills in visual basic language. (A3,PLO4)
DCG6231 SURVEY CAMP	**SURVEY CAMP** provides students with the knowledge and generates skill in the field of land and hydrographic surveys especially on measurement and positioning technique, data processing and plan presentation. This course puts emphasizes on the cadastral survey, engineering survey, GPS survey and hydrographic survey. It also exposes the students with team work in completing the tasks assigned during the survey camp.	**CLO1:** Complete the survey task during the engineering survey camp successfully and presenting engineering survey camp report satisfactorily.(P3,PLO2) **CLO2:** Perform control survey, cadastral and setting out survey works. Students also perform Global Positioning System (GPS) survey, hydrographic survey, and automation survey appropriately according to Department of Survey and Mapping Malaysia (JUPEM) and license surveyor. (P4, PLO2) **CLO3:** Demonstrate the ability to lead and work as a team to complete the task given according to JUPEM and License Surveyor standard. (A3,PLO9)

SEMESTER 6

COURSE	SYNOPSIS	COURSE LEARNING OUTCOME (CLO)
DUT 40110	**INDUSTRIAL TRAINING** exposes students to related workplace competencies demanded by industries. This course provides exposure to students in terms of technology literacy, effective communication, practice social skills and teamwork, policies, procedures and regulations, professional ethics and reporting. It also equips students with real work experience, thus helping students to perform as novice workers.	**CLO1:** Apply related knowledge and skills at the workplace. (C3, P2) **CLO2:** Communicate effectively with others. (A3) **CLO3:** Practice teamwork. (A5) **CLO4:** Professionally and ethically comply with policies, procedures and rules of the organization. (A5) **CLO5:** Explain the tasks assigned (during the industrial training) according to the prescribed format. (P2, A4)