

SARJANA KEJURUTERAAN (AWAM) *MASTER OF ENGINEERING (CIVIL)*

Pengenalan Program / *Introduction*

Program Sarjana Kejuruteraan (Awam) telah direka untuk memenuhi keperluan pembangunan berterusan jurutera profesional dan pihak industri. Salah satu objektif pendidikan yang dinyatakan adalah "untuk menghasilkan graduan yang mampu untuk menjadi pakar dalam bidang khusus dalam Kejuruteraan Awam". Untuk membantu mencapai matlamat ini, program ini menawarkan empat modul pengkususan iaitu 1) *Struktur dan Pembinaan Komposit*, 2) *Sumber Air Lestari*, 3) *Geoteknik dan*, 4) *Pengangkutan*. Calon perlu dengan jayanya melengkapkan 33 jam kredit (11 kursus) kerja kursus dengan mendapat minimum PNGK 3.0 dan melengkapkan sejumlah 12 jam kredit Projek Penyelidikan 1 dan Projek Penyelidikan 2. Sebelas (11) kerja kursus mengandungi satu (1) kursus citra universiti, dua (2) kursus teras, empat (4) kursus wajib modul dan empat (4) kursus elektif modul. Pengenalan kepada pengkhususan bukan sahaja memenuhi matlamat pendidikan dan hasil pembelajaran tetapi ia juga membantu graduan untuk mendapat pekerjaan dalam bidang yang diminati. Melalui penawaran kursus wajib dan elektif modul dalam program ini juga membolehkan lebih fleksibiliti dalam membina satu program pendidikan untuk memenuhi keperluan pelajar dan majikan.

The Master of Engineering (Civil) programme was designed to meet the continual professional development needs of professional engineers and the industry. One of the stated educational objectives is "to produce graduates who are able to become experts in a specific field in Civil Engineering". To help achieve this, the programme offers four module of specialisations, i.e. 1) Structural and Composite Constructions, 2) Sustainable Water Resources, 3) Geotechnics, and 4) Transports. A candidate is required to complete a programme of study consisting of 33 credit hours (11 courses) of course works obtaining a minimum CGPA of 3.0 and, a total of 12 credit hours by satisfactorily completing Research Project 1 and Research Project 2. The eleven (11) courses consist of one (1) citra university course, two (2) core courses, four (4) compulsory module courses and four (4) electives module courses chosen from the list provided for the respective field of specialization. The course coordinator will assist in the selection of elective courses. The introduction of specialisations not only clearly satisfy the educational objective and learning outcome but it also assists graduates to secure jobs in their areas of interest. Through the compulsory and elective courses offered in this programme also provides flexibility in constructing an educational programme to meet the needs of students and employers.

Syarat Kemasukan / *Entry Requirements*

1. Ijazah Sarjana Muda Kejuruteraan dengan Kepujian (PNGK 2.75 keatas) dari Universiti Kebangsaan Malaysia atau yang setara dari mana-mana universiti yang diiktiraf
A Bachelor of Engineering degree with honours (CGPA 2.75 and above) from The National University of Malaysia or its equivalent from any other recognized university

ATAU / OR;

- (a) PNGK 2.50 – 2.74 dengan sekurang-kurangnya 1 tahun pengalaman dalam bidang kejuruteraan setelah memperolehi ijazah untuk pemohon warganegara
CGPA 2.50 – 2.74 with at least 1 year working experience in engineering field after obtaining the degree for Malaysian applicants
- (b) PNGK 2.0 – 2.49 dengan sekurang-kurangnya 3 tahun pengalaman dalam bidang kejuruteraan setelah memperolehi ijazah untuk pemohon warganegara
CGPA 2.0 – 2.49 with at least 3 years working experience in engineering field after obtaining the degree for Malaysian applicants

ATAU / OR;

2. Ijazah Sarjana Muda Sains dengan Kepujian (PNGK minima 3.50) dari Universiti Kebangsaan Malaysia atau yang setara dari mana-mana universiti yang diiktiraf
A Bachelor of Science degree with honours (minimum CGPA 3.50) from The National University of Malaysia or its equivalent from any other recognized university

ATAU / OR;

3. Ijazah Sarjana Muda Sains dengan Kepujian (PNGK kurang 3.49) dari Universiti Kebangsaan Malaysia atau yang setara dari mana-mana universiti yang diiktiraf dan mempunyai 3 tahun pengalaman kerja dalam bidang kejuruteraan atau setara setelah memperolehi ijazah berkenaan untuk pemohon warganegara
A bachelor science degree with honours (CGPA 3.49 and below) from The National University of Malaysia or its equivalent from any other recognized university with at least 3 years working experience in engineering or related fields after obtaining the degree for Malaysian applicants.

Mod & Tempoh Program / Mode of Study & Programme Duration

- Mod Pengajian: Kerja Kursus / *Mode of Study: Course Work*
- Sepenuh Masa : 1½ - 2 tahun / *Full Time : 1½ -2 years*
- Separuh Masa: 2 - 4 tahun / *Part Time: 2-4 years*
**Kuliah bermula 6petang – 9malam, Isnin – Khamis / *All lectures start from 6-9pm, Monday – Thursday*

Keperluan Bahasa Inggeris / Requirement for English Language

Bagi calon antarabangsa, keperluan Bahasa Inggeris mestilah memenuhi syarat skor atau band minimum yang ditetapkan iaitu 550 (TOEFL) atau 5.5 (IELTS)
For international candidates, requirements for English Language is minimum 550 (TOEFL) or 5.5 (IELTS).

Kelebihan Program / *Programme Advantages*

- Memenuhi keperluan MQA
Fulfill the MQA requirement
- Selaras dengan perkembangan ilmu semasa dan memenuhi kehendak industri dan pihak berkepentingan
In accordance with the current knowledge development and fulfil the industry needs and interested parties
- Memberi pilihan kepada pelajar untuk meningkatkan ilmu dan kemahiran dalam bidang kejuruteraan awam yang di tawarkan secara modul elektif
Opportunities for the student to choose civil engineering knowledge and skills through various elective modules.

Yuran Program / *Programme Fee*

Warganegara / *Citizens*

Yuran / <i>Fees</i>	Sepenuh Masa / <i>Full Time</i>	Separuh Masa / <i>Part Time</i>
Semester pertama / <i>1st semester</i>	RM 6,500.00	RM 5,000.00
Semester kedua / <i>2nd semester</i>	RM 4,250.00	RM 3,500.00
Semester ketiga / <i>3rd semester</i>	RM 4,250.00	RM 3,500.00
Semester keempat / <i>4rd semester</i>	-	RM 3,500.00
Pakej Pengajian / <i>Package Fees</i>	RM 15,000.00 *3 semester	RM 15,500.00 *4 semester pengajian

**RM1500/semester - tambah masa

Bukan Warganegara / *Non-Citizens*

Yuran / <i>Fees</i>	Sepenuh Masa / <i>Full Time</i>
Semester pertama / <i>1st semester</i>	RM 12,000.00
Semester kedua / <i>2nd semester</i>	RM 10,500.00
Semester ketiga / <i>3rd semester</i>	RM 10,500.00
Pakej Pengajian / <i>Package Fees</i>	RM 33,000.00 *3 semester

**RM2000/semester - extension time

Cara untuk memohon / *How to apply*

Pendaftaran secara online melalui <http://smp.ukm.my/espeed/> (pengambilan September). Yuran permohonan sebanyak RM50.00 (untuk pemohon tempatan) dan USD30.00 atau RM100.00 (untuk pemohon antarabangsa) dibuat ke akaun CIMB Bank Berhad atas nama Pusat Kembangan Pendidikan (8002233817).

Online registration via <http://smp.ukm.my/espeed/> (September Intake). Application fee of RM50.00 (for Malaysian application), USD30.00 or MYR100.00 (for International applicants) has be paid to Pusat Kembangan Pendidikan, CIMB account number (8002233817).

Modul Program untuk sepenuh masa / *Course Modules for full time*

Semester	Kod Kursus/ <i>Course Code</i>	Tajuk Kursus / <i>Course Name</i>	Taraf Kursus/ <i>Category</i>	Unit/ <i>Units</i>	
Semester 1	KKKA6002	Kaedah Penyelidikan dan Inovasi <i>Research Methodology and Innovation</i>	W	2	
	KKKA6014	Pengurusan dan Projek Implementasi <i>Management and Project Implementation</i>	W	4	
	Elektif Modul Struktur dan Pembinaan Komposit / <i>Electives Module Structural and Composite Constructions</i>				
	KKKA6103	Teori Struktur Lanjutan <i>Advanced Theory of Structures</i>	WM	3	
	KKKA6143	Kaedah Unsur Terhingga <i>Finite Element Method</i>	WM	3	
	Elektif Subjek (Pilih 1 sahaja) / <i>Electives Subject (Select 1subject only)</i>				
	KKKA6223	Beban Ekstrem pada Struktur <i>Extreme Loading on Structures</i>	EM	3	
	KKKA6183	Konkrit Prategasan Lanjutan <i>Advanced Prestressed Concrete</i>	EM	3	
	KKKA6193	Forensik, Penilaian dan Penyelenggaraan Struktur Konkrit <i>Forensic, Assessment and Maintenance of Concrete Structures</i>	EM	3	
	KKKA6573	Kejuruteraan Jambatan <i>Bridge Engineering</i>	EM	3	
	KKKA6503	Cerun Dan Struktur Penahan <i>Slopes and Retaining Structures</i>	EM	3	
	Elektif Modul Sumber Air Lestari / <i>Electives Module Sustainable Water Resources</i>				
	KKKA6303	Hidrologi Air Permukaan <i>Surface Water Hydrology</i>	WM	3	
	KKKA6443	Kimia dan Ekologi Air Semulajadi <i>Natural Water Chemistry and Ecology</i>	WM	3	
	Elektif Subject (Pilih 1 sahaja) / <i>Electives Subject (Select 1subject only)</i>				
	KKKA6363	Pengangkutan sedimen <i>Sediment Transport</i>	EM	3	

KKKA6833	Pengurusan Air Ribut <i>Stormwater Management</i>	EM	3
KKKA6083	Kejuruteraan Air Bawah Tanah Lanjutan <i>Advanced Ground Water Engineering</i>	EM	3
KKKA6623	Teknologi Geospasial <i>Geospatial Engineering</i>	EM	3
KKKA6473	Pengurusan dan Kejuruteraan Air Lestari <i>Sustainable Water Management and Engineering</i>	EM	3
KKKA6433	Kejuruteraan Sungai <i>River Engineering</i>	EM	3
Elektif Modul Geoteknik / <i>Electives Module Geotechnics</i>			
KKKA6503	Cerun Dan Struktur Penahan <i>Slopes and Retaining Structures</i>	WM	3
KKKA6613	Ujian Makmal dan Instrumentasi di Lapangan <i>Laboratory Test and Field Instrumentation</i>	WM	3
Elektif Subject (Pilih 1 sahaja) / <i>Electives Subject (Select 1subject only)</i>			
KKKA6313	Dinamik Tanah <i>Soil Dynamics</i>	EM	3
KKKA6143	Kaedah Unsur Terhingga <i>Finite Element Method</i>	EM	3
KKKA6083	Kejuruteraan Air Bawah Tanah Lanjutan <i>Advanced Ground Water Engineering</i>	EM	3
KKKA6623	Teknologi Geospasial <i>Geospatial Technologies</i>	EM	3
Elektif Modul Pengangkutan / <i>Electives Module Transports</i>			
KKKA6703	Sistem Pengurusan Lalu Lintas Pintar <i>Intelligent Traffic Management System</i>	WM	3
KKKA6743	Perancangan Pengangkutan Bandar dan Operasi <i>Urban Transportation Planning and Operation</i>	WM	3
Elektif Subject (Pilih 1 sahaja) / <i>Electives Subject (Select 1subject only)</i>			
KKKA6753	Operasi Pengangkutan dan Pengurusan Sistem <i>Transport Operation and System Management</i>	EM	3
KKKA6763	Asfalt dalam Pembinaan Jalan Raya <i>Asphalts in Road Construction</i>	EM	3
KKKA6143	Kaedah Unsur Terhingga	EM	3

		<i>Finite Element Method</i>		
	KKKA6623	Teknologi Geospasial <i>Geospasial Technologies</i>	EM	3
			Kredit	15
Semester 2	CMIE	Kursus Keusahawanan <i>Entrepreneurship Electives</i>	P	3
	KKKA6004	Projek Penyelidikan 1 <i>Research Project 1</i>	W	4
	Elektif Modul Struktur dan Pembinaan Komposit / <i>Electives Module Structural and Composite Constructions</i>			
	KKKA6263	Inovasi dalam Pembinaan Komposit <i>Innovation in Composite Constructions</i>	WM	3
	KKKA6493	Reka Bentuk Struktur Komposit Keluli dan Konkrit <i>Design of Steel and Concrete Composite</i>	WM	3
	Elektif Subject (Pilih 1 subjek sahaja) / <i>Electives Subject (Select 1subject only)</i>			
	KKKA6283	Bangunan Tinggi dan Kejuruteraan Angin <i>Tall Buildings and Wind Structures</i>	EM	3
	KKKA6173	Reka Bentuk Konkrit Tetulang Lanjutan <i>Advanced Reinforced Concrete Design</i>	EM	3
	KKKA6203	Binarium <i>Constructionarium</i>	EM	3
	KKKA6553	Kejuruteraan Asas Tapak Lanjutan <i>Advanced Foundation Engineering</i>	EM	3
	Elektif Modul Sumber Air Lestari / <i>Electives Module Sustainable Water Resources</i>			
	KKKA6953	Perancangan Sumber Air <i>Water Resources Planning</i>	WM	3
	KKKA6463	Plan Kawalan Hakisan dan Sedimentasi <i>Erosion and Sediment Control Plan</i>	WM	3
	Elektif Subject (Pilih 1 sahaja) / <i>Electives Subject (Select 1subject only)</i>			
	KKKA6453	Permodelan Kualiti Air <i>Water Quality Modelling</i>	EM	3
	KKKA6483	Kejuruteraan Pantai <i>Coastal Engineering</i>	EM	3
KKKA6403	Pengurusan Sisa Pepejal Perbandaran	EM	3	

		<i>Municipal Solid Waste Management</i>		
	KKKA6443	Analisis Risiko Sekitaran dan Kuantitatif <i>Environmental Risk Analysis and Quantitative</i>	EM	3
Elektif Modul Geoteknik / <i>Electives Module Geotechnics</i>				
	KKKA6113	Mekanik Tanah Lanjutan <i>Advanced Soil Mechanics</i>	WM	3
	KKKA6553	Kejuruteraan Asas Lanjutan <i>Advanced Foundation Engineering</i>	WM	3
Elektif Subject (Pilih 1 sahaja) / <i>Electives Subject (Select 1subject only)</i>				
	KKKA6583	Kejuruteraan Geo-Sekitaran Lanjutan <i>Advanced Geoenvironmental Engineering</i>	EM	3
	KKKA6203	Binarium <i>Constructionarium</i>	EM	3
	KKKA6463	Plan Kawalan Hakisan dan Sedimentasi <i>Erosion and Sediment Control Plan</i>	EM	3
Elektif Modul Pengangkutan / <i>Electives Module Transports</i>				
	KKKA6783	Teori Aliran Lalu Lintas Lanjutan dan Analisis Pemodelan <i>Advanced Theory of Traffic Flow and Modelling Analysis</i>	WM	3
	KKKA6793	Ekonomi Pengangkutan, Harga dan Kewangan <i>Transport Economics, Pricing and Finance</i>	WM	3
Elektif Subject (Pilih 1 sahaja) / <i>Electives Subject (Select 1subject only)</i>				
	KKKA6673	Perancangan Bandar Mapan <i>Sustainable Urban Planning</i>	EM	3
	KKKA6873	Permintaan Kembara Lanjutan, Pemodelan dan Analisis <i>Advanced Travel Demand, Modelling and Analysis</i>	EM	3
	KKKA6203	Binarium <i>Constructionarium</i>	EM	3
			Kredit	16
Semester 3	KKKA6008	Projek Penyelidikan 2 <i>Research Project 2</i>	W	8
Elektif Modul Struktur dan Pembinaan Komposit / <i>Electives Module Structural and Composite Constructions</i>				

Elektif Subject (Pilih 2 sahaja) / <i>Electives Subject (Select 2 subject only)</i>			
KKKA6223	Beban Ekstrem pada Struktur <i>Extreme Loading on Structures</i>	EM	3
KKKA6183	Konkrit Prategasan Lanjutan <i>Advanced Prestressed Concrete</i>	EM	3
KKKA6193	Forensik, Penilaian dan Penyelenggaraan Struktur Konkrit <i>Forensic, Assessment and Maintenance of Concrete Structures</i>	EM	3
KKKA6573	Kejuruteraan Jambatan <i>Bridge Engineering</i>	EM	3
KKKA6503	Cerun Dan Struktur Penahan <i>Slopes and Retaining Structures</i>	EM	3
Elektif Modul Sumber Air Lestari / <i>Electives Module Sustainable Water Resources</i>			
Elektif Subject (Pilih 2 sahaja) / <i>Electives Subject (Select 2 subject only)</i>			
KKKA6363	Pengangkutan sedimen <i>Sediment Transport</i>	EM	3
KKKA6833	Pengurusan Air Ribut <i>Stormwater Management</i>	EM	3
KKKA6083	Kejuruteraan Air Bawah Tanah Lanjutan <i>Advanced Ground Water Engineering</i>	EM	3
KKKA6623	Teknologi Geospasial <i>Geospatial Engineering</i>	EM	3
KKKA6473	Pengurusan dan Kejuruteraan Air Lestari <i>Sustainable Water Management and Engineering</i>	EM	3
KKKA6433	Kejuruteraan Sungai <i>River Engineering</i>	EM	3
Elektif Modul Geoteknik / <i>Electives Module Geotechnics</i>			
Elektif Subject (Pilih 2 sahaja) / <i>Electives Subject (Select 2 subject only)</i>			
KKKA6313	Dinamik Tanah <i>Soil Dynamics</i>	EM	3
KKKA6143	Kaedah Unsur Terhingga <i>Finite Element Method</i>	EM	3
KKKA6083	Kejuruteraan Air Bawah Tanah Lanjutan <i>Advanced Ground Water Engineering</i>	EM	3

	KKKA6623	Teknologi Geospasial <i>Geospatial Technologies</i>	EM	3
Elektif Modul Pengangkutan / <i>Electives Module Transports</i>				
Elektif Subject (Pilih 2 sahaja) / <i>Electives Subject (Select 2 subject only)</i>				
	KKKA6753	Operasi Pengangkutan dan Pengurusan Sistem <i>Transport Operation and System Management</i>	EM	3
	KKKA6763	Asfalt dalam Pembinaan Jalan Raya <i>Asphalts in Road Construction</i>	EM	3
	KKKA6143	Kaedah Unsur Terhingga <i>Finite Element Method</i>	EM	3
	KKKA6623	Teknologi Geospasial <i>Geospatial Technologies</i>	EM	3
			Kredit	14
Total				45

****Nota:** W = Wajib / *Compulsory*; WM = Wajib Modul / *Compulsory Module*; P = Pilihan / *Elective*; EM = Elektif Modul / *Elective Module* AU – Audit / *Audit*

*Subject to change

Modul Program untuk separuh masa / *Course Modules for part time*

Semester	Kod Kursus/ <i>Course Code</i>	Tajuk Kursus / <i>Course Name</i>	Taraf Kursus/ <i>Category</i>	Unit/ <i>Units</i>
Semester 1	KKKA6002	Kaedah Penyelidikan dan Inovasi <i>Research Methodology and Innovation</i>	W	2
	KKKA6014	Pengurusan dan Projek Implementasi <i>Management and Project Implementation</i>	W	4
	Elektif Modul Struktur dan Pembinaan Komposit / <i>Electives Module Structural and Composite Constructions</i>			
	KKKA6103	Teori Struktur Lanjutan <i>Advanced Theory of Structures</i>	WM	3
	Elektif Modul (Pilih 1 sahaja) / <i>Electives Subject (Select 1subject only)</i>			
	KKKA6223	Beban Ekstrem pada Struktur <i>Extreme Loading on Structures</i>	EM	3
	KKKA6183	Konkrit Prategasan Lanjutan <i>Advanced Prestressed Concrete</i>	EM	3

KKKA6193	Forensik, Penilaian dan Penyelenggaraan Struktur Konkrit <i>Forensic, Assessment and Maintenance of Concrete Structures</i>	EM	3
KKKA6573	Kejuruteraan Jambatan <i>Bridge Engineering</i>	EM	3
KKKA6503	Cerun Dan Struktur Penahan <i>Slopes and Retaining Structures</i>	EM	3
Elektif Modul Sumber Air Lestari / <i>Electives Module Sustainable Water Resources</i>			
KKKA6303	Hidrologi Air Permukaan <i>Surface Water Hydrology</i>	WM	3
Elektif Subject (Pilih 1 sahaja)/ <i>Electives Subject (Select 1subject only)</i>			
KKKA6363	Pengangkutan sedimen <i>Sediment Transport</i>	EM	3
KKKA6833	Pengurusan Air Ribut <i>Stormwater Management</i>	EM	3
KKKA6083	Kejuruteraan Air Bawah Tanah Lanjutan <i>Advanced Ground Water Engineering</i>	EM	3
KKKA6623	Teknologi Geospasial <i>Geospatial Engineering</i>	EM	3
KKKA6473	Pengurusan dan Kejuruteraan Air Lestari <i>Sustainable Water Management and Engineering</i>	EM	3
KKKA6433	Kejuruteraan Sungai <i>River Engineering</i>	EM	3
Elektif Modul Geoteknik / <i>Electives Module Geotechnics</i>			
KKKA6503	Cerun Dan Struktur Penahan <i>Slopes and Retaining Structures</i>	WM	3
Elektif Subject (Pilih 1 sahaja)/ <i>Electives Subject (Select 1subject only)</i>			
KKKA6313	Dinamik Tanah <i>Soil Dynamics</i>	EM	3
KKKA6143	Kaedah Unsur Terhingga <i>Finite Element Method</i>	EM	3
KKKA6083	Kejuruteraan Air Bawah Tanah Lanjutan <i>Advanced Ground Water Engineering</i>	EM	3
KKKA6623	Teknologi Geospasial <i>Geospatial Technologies</i>	EM	3

Elektif Modul Pengangkutan / <i>Electives Module Transports</i>					
	KKKA6703	Sistem Pengurusan Lalu Lintas Pintar <i>Intelligent Traffic Management System</i>	WM	3	
Elektif Subject (Pilih 1 sahaja) / <i>Electives Subject (Select 1subject only)</i>					
	KKKA6753	Operasi Pengangkutan dan Pengurusan Sistem <i>Transport Operation and System Management</i>	EM	3	
	KKKA6763	Asfalt dalam Pembinaan Jalan Raya <i>Asphalts in Road Construction</i>	EM	3	
	KKKA6143	Kaedah Unsur Terhingga <i>Finite Element Method</i>	EM	3	
	KKKA6623	Teknologi Geospasial <i>Geospatial Technologies</i>	EM	3	
			Kredit	12	
Semester 2	CMIE60XX	Kursus Keusahawanan <i>Entrepreneurship Electives</i>	P	3	
	Elektif Modul Struktur dan Pembinaan Komposit / <i>Electives Module Structural and Composite Constructions</i>				
	KKKA6263	Inovasi dalam Pembinaan Komposit <i>Innovation in Composite Constructions</i>	WM	3	
	KKKA6493	Reka Bentuk Struktur Komposit Keluli dan Konkrit <i>Design of Steel and Concrete Composite</i>	WM	3	
	Elektif Subject (Pilih 1 subjek sahaja) / <i>Electives Subject (Select 1subject only)</i>				
	KKKA6283	Bangunan Tinggi dan Kejuruteraan Angin <i>Tall Buildings and Wind Structures</i>	EM	3	
	KKKA6173	Reka Bentuk Konkrit Tetulang Lanjutan <i>Advanced Reinforced Concrete Design</i>	EM	3	
	KKKA6203	Binarium <i>Constructionarium</i>	EM	3	
	KKKA6553	Kejuruteraan Asas Tapak Lanjutan <i>Advanced Foundation Engineering</i>	EM	3	
	Elektif Modul Sumber Air Lestari / <i>Electives Module Sustainable Water Resources</i>				
	KKKA6953	Perancangan Sumber Air <i>Water Resources Planning</i>	WM	3	
	KKKA6463	Plan Kawalan Hakisan dan Sedimentasi	WM	3	

	<i>Erosion and Sediment Control Plan</i>		
Elektif Subject (Pilih 1 sahaja)/ <i>Electives Subject (Select 1subject only)</i>			
KKKA6453	Permodelan Kualiti Air <i>Water Quality Modelling</i>	EM	3
KKKA6483	Kejuruteraan Pantai <i>Coastal Engineering</i>	EM	3
KKKA6403	Pengurusan Sisa Pepejal Perbandaran <i>Municipal Solid Waste Management</i>	EM	3
KKKA6443	Analisis Risiko Sekitaran dan Kuantitatif <i>Environmental Risk Analysis and Quantitative</i>	EM	3
Elektif Modul Geoteknik / <i>Electives Module Geotechnics</i>			
KKKA6113	Mekanik Tanah Lanjutan <i>Advanced Soil Mechanics</i>	WM	3
KKKA6553	Kejuruteraan Asas Lanjutan <i>Advanced Foundation Engineering</i>	WM	3
Elektif Subject (Pilih 1 sahaja)/ <i>Electives Subject (Select 1subject only)</i>			
KKKA6583	Kejuruteraan Geo-Sekitaran Lanjutan <i>Advanced Geoenvironmental Engineering</i>	EM	3
KKKA6203	Binarium <i>Constructionarium</i>	EM	3
KKKA6463	Plan Kawalan Hakisan dan Sedimentasi <i>Erosion and Sediment Control Plan</i>	EM	3
Elektif Modul Pengangkutan / <i>Electives Module Transports</i>			
KKKA6783	Teori Aliran Lalu Lintas Lanjutan dan Analisis Pemodelan <i>Advanced Theory of Traffic Flow and Modelling Analysis</i>	WM	3
KKKA6793	Ekonomi Pengangkutan, Harga dan Kewangan <i>Transport Economics, Pricing and Finance</i>	WM	3
Elektif Subject (Pilih 1 sahaja)/ <i>Electives Subject (Select 1subject only)</i>			
KKKA6673	Perancangan Bandar Mapan <i>Sustainable Urban Planning</i>	EM	3
KKKA6873	Permintaan Kembara Lanjutan, Pemodelan dan Analisis <i>Advanced Travel Demand, Modelling and Analysis</i>	EM	3

	KKKA6203	Binarium <i>Constructionarium</i>	EM	3
			Kredit	12
Semester 3	KKKA6004	Projek Penyelidikan 1 <i>Research Project 1</i>	W	4
	Elektif Modul Struktur dan Pembinaan Komposit / <i>Electives Module Structural and Composite Constructions</i>			
	Elektif Subject (Pilih 1 sahaja) / <i>Electives Subject (Select 1 subject only)</i>			
	KKKA6223	Beban Ekstrem pada Struktur <i>Extreme Loading on Structures</i>	EM	3
	KKKA6183	Konkrit Prategasan Lanjutan <i>Advanced Prestressed Concrete</i>	EM	3
	KKKA6193	Forensik, Penilaian dan Penyelenggaraan Struktur Konkrit <i>Forensic, Assessment and Maintenance of Concrete Structures</i>	EM	3
	KKKA6573	Kejuruteraan Jambatan <i>Bridge Engineering</i>	EM	3
	KKKA6503	Cerun Dan Struktur Penahan <i>Slopes and Retaining Structures</i>	EM	3
	Elektif Modul Sumber Air Lestari / <i>Electives Module Sustainable Water Resources</i>			
	Elektif Subject (Pilih 1 sahaja) / <i>Electives Subject (Select 1 subject only)</i>			
	KKKA6363	Pengangkutan sedimen <i>Sediment Transport</i>	EM	3
	KKKA6833	Pengurusan Air Ribut <i>Stormwater Management</i>	EM	3
	KKKA6083	Kejuruteraan Air Bawah Tanah Lanjutan <i>Advanced Ground Water Engineering</i>	EM	3
	KKKA6623	Teknologi Geospasial <i>Geospatial Engineering</i>	EM	3
	KKKA6473	Pengurusan dan Kejuruteraan Air Lestari <i>Sustainable Water Management and Engineering</i>	EM	3
	KKKA6433	Kejuruteraan Sungai <i>River Engineering</i>	EM	3
	Elektif Modul Geoteknik / <i>Electives Module Geotechnics</i>			

Elektif Subject (Pilih 1 sahaja) / Electives Subject (Select 1 subject only)				
	KKKA6313	Dinamik Tanah <i>Soil Dynamics</i>	EM	3
	KKKA6143	Kaedah Unsur Terhingga <i>Finite Element Method</i>	EM	3
	KKKA6083	Kejuruteraan Air Bawah Tanah Lanjutan <i>Advanced Ground Water Engineering</i>	EM	3
	KKKA6623	Teknologi Geospasial <i>Geospatial Technologies</i>	EM	3
Elektif Modul Pengangkutan / Electives Module Transports				
Elektif Subject (Pilih 1 sahaja) / Electives Subject (Select 1 subject only)				
	KKKA6753	Operasi Pengangkutan dan Pengurusan Sistem <i>Transport Operation and System Management</i>	EM	3
	KKKA6763	Asfalt dalam Pembinaan Jalan Raya <i>Asphalts in Road Construction</i>	EM	3
	KKKA6143	Kaedah Unsur Terhingga <i>Finite Element Method</i>	EM	3
	KKKA6623	Teknologi Geospasial <i>Geospatial Technologies</i>	EM	3
			Kredit	10
Semester 4	KKKA6008	Projek Penyelidikan 2 <i>Research Project 2</i>	W	8
Elektif Modul Struktur dan Pembinaan Komposit / Electives Module Structural and Composite Constructions				
Elektif Subject (Pilih 1 sahaja) / Electives Subject (Select 1 subject only)				
	KKKA6283	Bangunan Tinggi dan Kejuruteraan Angin <i>Tall Buildings and Wind Structures</i>	EM	3
	KKKA6173	Reka Bentuk Konkrit Tetulang Lanjutan <i>Advanced Reinforced Concrete Design</i>	EM	3
	KKKA6203	Binarium <i>Constructionarium</i>	EM	3
	KKKA6553	Kejuruteraan Asas Tapak Lanjutan <i>Advanced Foundation Engineering</i>	EM	3
Elektif Modul Sumber Air Lestari / Electives Module Sustainable Water Resources				
Elektif Subject (Pilih 1 sahaja) / Electives Subject (Select 1 subject only)				
	KKKA6453	Permodelan Kualiti Air <i>Water Quality Modelling</i>	EM	3
	KKKA6483	Kejuruteraan Pantai	EM	3

		<i>Coastal Engineering</i>		
KKKA6403	Pengurusan Sisa Pepejal Perbandaran <i>Municipal Solid Waste Management</i>		EM	3
KKKA6443	Analisis Risiko Sekitaran dan Kuantitatif <i>Environmental Risk Analysis and Quantitative</i>		EM	3
Elektif Modul Geoteknik / <i>Electives Module Geotechnics</i>				
Elektif Subject (Pilih 1 sahaja) / <i>Electives Subject (Select 1 subject only)</i>				
KKKA6583	Kejuruteraan Geo-Sekitaran Lanjutan <i>Advanced Geoenvironmental Engineering</i>		EM	3
KKKA6203	Binarium <i>Constructionarium</i>		EM	3
KKKA6463	Plan Kawalan Hakisan dan Sedimentasi <i>Erosion and Sediment Control Plan</i>		EM	3
Elektif Modul Pengangkutan / <i>Electives Module Transports</i>				
Elektif Subject (Pilih 1 sahaja) / <i>Electives Subject (Select 1 subject only)</i>				
KKKA6673	Perancangan Bandar Mapan <i>Sustainable Urban Planning</i>		EM	3
KKKA6873	Permintaan Kembara Lanjutan, Pemodelan dan Analisis <i>Advanced Travel Demand, Modelling and Analysis</i>		EM	3
KKKA6203	Binarium <i>Constructionarium</i>		EM	3
			Kredit	11
			Total	45

****Nota:** W = Wajib / *Compulsory*; WM = Wajib Modul / *Compulsory Module*; P = Pilihan / *Elective*; EM = Elektif Modul / *Elective Module* AU – Audit / *Audit*

*Subject to change

Sebarang pertanyaan lanjut, sila hubungi:

Any enquiry please contact:

EN. MOHD AKMAL HARITH BIN MOHAMMAD HANAFIAH

Eksekutif Pemasaran / *Marketing Executive*
marketingpkp@ukm.edu.my.

PROF. MADYA DR. SHAHRIZAN BAHAROM
ASSOCIATE PROF. DR. SHAHRIZAN BAHAROM

Penyelaras Program / *Programme Coordinator*
shahrizan@ukm.edu.my