

STRUKTUR KURIKULUM/ CURRICULUM STRUCTURE

Nama Program : **Bachelor Sains Kimia Petroleum dengan Kepujian/ Bachelor of Science in Petroleum Chemistry with Honours**

Jumlah Kredit Bergraduat : **124 Jam Kredit/ Credit Hours**

Tempoh Pengajian : **8 Semester/ Semesters (4 Tahun/ Years)**

Matlamat Program :

1. Melahirkan ahli kimia petroleum yang kompeten dalam aspek teori dan praktikal bagi menerajui bidang berasaskan kimia.
2. Melahirkan penyelidik yang berpengetahuan dan berkemahiran penyelidikan bagi tujuan inovasi dan pengajian lanjutan.
3. Melahirkan pegawai dalam bidang berkaitan yang beretika dan berintegriti di sesebuah organisasi.

RINGKASAN HASIL PEMBELAJARAN PROGRAM

Program	Pengetahuan dan kefahaman (C)	Kemahiran praktikal (P)	Kemahiran kognitif (CTPS)	Kemahiran komunikasi (CS)	Kemahiran interpersonal (TS)	Etika dan profesionalisme (EM)	Kemahiran digital dan pendidikan sepanjang hayat (LL)	Kemahiran personal dan keusahawanan (KK)	Kepimpinan, autonomi dan tanggungjawab (LS)	Kemahiran numerasi (NS)
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
Bachelor Sains Kimia Petroleum dengan Kepujian	36	19	27	8	9	8	12	4	4	5

1. Kursus Universiti/ University Courses (20 Kredit/ Credits)

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T	PRASYARAT/ PREREQUISITE
LPE2301	Academic Interaction and Presentation	3	3	0	LPE2401 atau/or MUET Band 3 atau/or 4
LPE2501	Academic Writing	3	3	0	LPE2301
MGM3180	Asas Keusahawanan/ Basic Entrepreneurship	3	2	1	Tiada/ None
PRT2009	Pertanian dan Kehidupan/ Agriculture and Life	2	1	1	Tiada/ None
SKP2101*	Kenegaraan Malaysia/ Malaysian Nationhood	3	3	0	Tiada/ None
FEM2401**	Politik Malaysia dan Masyarakat/ Malaysian Politics and Society	2	2	0	Tiada/ None

SKP3112*	Falsafah dan Isu Semasa/ <i>Philosophy and Current Issues</i>	2	2	0	Tiada/ <i>None</i>
SKP3113**	Falsafah dan Isu Semasa Masyarakat Sivil/ <i>Philosophy and Current Issues in Civil Society</i>	3	3	0	Tiada/ <i>None</i>
atau/ or	atau/ or				
SKP3123**	Penghayatan Etika dan Peradaban di Malaysia/ <i>Internalization of Ethics and Civilization in Malaysia</i>	3	3	0	Tiada/ <i>None</i>
SKP3122*	Penghayatan Etika dan Peradaban/ <i>Internalization of Ethics and Civilization</i>	2	2	0	Tiada/ <i>None</i>
LPM2100**	Bahasa Melayu Komunikasi/ <i>Malay Language Communication</i>	2	2	0	Tiada/ <i>None</i>
QKXxxxx	Kokurikulum/ <i>Co-curriculum</i>	1	0	1	Tiada/ <i>None</i>
QKXxxxx	Kokurikulum/ <i>Co-curriculum</i>	1	0	1	Tiada/ <i>None</i>

Nota: *pelajar tempatan/*local student* **pelajar antarabangsa/*international student*

2. Kursus Teras/ *Core Courses* (73 Kredit/ *Credits*)

KOD KURSUS/ <i>COURSE CODE</i>	NAMA KURSUS/ <i>COURSE NAME</i>	Kr	K	A/T	PRASYARAT/ <i>PREREQUISITE</i>
CHY3003	Asas Keselamatan Makmal/ <i>Basic Laboratory Safety/</i>	2	2	0	Tiada/ <i>None</i>
CHY3101	Kimia Fizik I/ <i>Physical Chemistry I</i>	4	3	1	Tiada/ <i>None</i>
CHY3102	Kimia Fizik II/ <i>Physical Chemistry II</i>	4	3	1	CHY3101
CHY3201	Kimia Organik I/ <i>Organic Chemistry I</i>	4	3	1	CHY2001 atau/or setara/ <i>equivalent</i>
CHY3202	Kimia Organik II/ <i>Organic Chemistry II</i>	4	3	1	CHY3201
CHY3301	Keberkalaan dan Ikatan Kimia/ <i>Periodicity and Chemical Bonding</i>	4	3	1	CHY2001 atau/or setara/ <i>equivalent</i>
CHY3304	Struktur Pepejal & Kimia Koordinatan/ <i>Solid Structure and Coordination Chemistry</i>	4	3	1	CHY3301
CHY3401	Kimia Analisis/ <i>Analytical Chemistry</i>	3	2	1	CHY3101 atau/ or CHY3002
CHY3402	Spektroskopi Kimia/ <i>Chemical Spectroscopy</i>	4	3	1	CHY3101 dan/ and CHY3201
CHY3504	Prinsip Teknologi Kimia/ <i>Chemical Technology Principles</i>	4	4	0	CHY3102
CHY3601	Kimia Petroleum/ <i>Petroleum Chemistry</i>	3	3	0	CHY3202
CHY3602	Proses Penapisan Petroleum/ <i>Petroleum Refining Processes</i>	3	3	0	CHY3202

CHY3603	Petrokimia dari Hidrokarbon Ringan/ <i>Petrochemicals from Light Hydrocarbon</i>	3	3	0	CHY3602
CHY3604	Petrokimia dari Sebatian Aromatik/ <i>Petrochemicals from Aromatics Compounds</i>	3	3	0	CHY3603
CHY3605	Kawalan Tumpahan Minyak/ <i>Oil Spill Control</i>	3	3	0	CHY3601
CHY3606	Amali dalam Kimia Petroleum/ <i>Practical in Petroleum Chemistry</i>	1	0	1	CHY3603
CHY4601	Pemangkinan Heterogen/ <i>Heterogeneous Catalysis</i>	3	2	1	CHY3102
CHY4903	Latihan Industri/ <i>Industrial Training</i>	8	0	8	Kebenaran Jabatan/ <i>Department Approval</i>
CHY4959	Disertasi Bachelo/ <i>Bachelor Dissertation</i>	6	0	6	Kebenaran Jabatan/ <i>Department Approval</i>
MTS3100	Kalkulus/ <i>Calculus</i>	3	3	0	Tiada/ <i>None</i>

3. Kursus Elektif/ *Elective Courses* (31 Kredit/ *Credits*)

Pelajar dikehendaki mengambil 16 kredit dari kursus yang tersenarai dalam Elektif Bidang, 9 kredit dari Elektif Opsyen dan 6 kredit dari Elektif Umum dengan persetujuan Ketua Jabatan/ *Students are required to take 16 credits of courses listed in Major Electives, 9 credits from Optional Electives and 6 credits from General Electives with the approval of the Head of Department.*

i. Elektif Bidang/ *Major Electives* (16 Kredit/ *Credits*)

KOD KURSUS/ <i>COURSE CODE</i>	NAMA KURSUS/ <i>COURSE NAME</i>	Kr	K	A/T	PRASYARAT/ <i>PREREQUISITE</i>
CHY3103	Kimia Polimer/ <i>Polymer Chemistry</i>	4	3	1	CHY3101
CHY3203	Sintesis Organik/ <i>Organic Synthesis</i>	4	3	1	CHY3202 dan/ <i>and</i> CHY3402
CHY3506	Oleokimia/ <i>Oleochemistry</i>	3	2	1	CHY3202
CHY3508	Kimia Hijau/ <i>Green Chemistry</i>	3	2	1	CHY3402
CHY4101	Kinetik Kimia/ <i>Chemical Kinetics</i>	3	2	1	CHY3102
CHY4102	Termodinamik Kimia/ <i>Chemical Thermodynamics</i>	3	2	1	CHY3102
CHY4103	Kimia Pengkomputeran/ <i>Computational Chemistry</i>	4	3	1	CHY3102
CHY4401	Elektrokimia/ <i>Electrochemistry</i>	3	3	0	CHY3101 dan/ <i>and</i> CHY3401
CHY4402	Teknik Pemisahan/ <i>Separation Techniques</i>	3	3	0	CHY3401
CHY4301	Kimia Keadaan Pepejal/ <i>Solid State Chemistry</i>	3	3	0	CHY3302 atau/ <i>or</i> CHY3304

CHY4501	Keusahawanan Kimia/ <i>Chempreneurship</i>	3	3	0	CHY3501 atau/ or CHY3504
FSA4001	Sistem Pengurusan Kualiti dalam Sains/ <i>Quality Management System in Science</i>	3	3	0	Tiada/ <i>None</i>

ii. Elektif Opsyen/ *Optional Electives* (9 Kredit/ *Credits*)

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T	PRASYARAT/ PREREQUISITE
CHY3205	Kimia Protein/ <i>Protein Chemistry</i>	3	3	0	CHY3202 dan/ and CHY3402
CHY4302	Kimia Biotakorganik/ <i>Bioinorganic Chemistry</i>	3	3	0	CHY3303 atau/ or CHY3304
CHY4403	Kimia Forensik/ <i>Forensic Chemistry</i>	3	3	0	CHY3402
FSA4002	Pengurusan Inovasi dan Teknologi untuk Saintis/ <i>Inovation and Technology Management for Scientist</i>	3	3	0	Tiada/ <i>None</i>
ECH3605	Taksiran Risiko dan Keselamatan/ <i>Safety and Risk Assessment</i>	3	3	0	Tiada/ <i>None</i>
ECH4408	Kejuruteraan Polimer/ <i>Polymer Engineering</i>	3	3	0	Tiada/ <i>None</i>
EOH3202	Kesihatan Pekerjaan/ <i>Occupational Health</i>	3	3	0	Tiada/ <i>None</i>
EOH3206	Keselamatan Industri dan Tindakan Kecemasan/ <i>Industrial Safety and Emergency Response</i>	4	4	0	Tiada/ <i>None</i>
ECH4410	Pemprosesan Bahan Nano/ <i>Nanomaterials Processing</i>	3	3	0	Tiada/ <i>None</i>
ESC3012	Teknologi Rawatan Sisa Pepejal/ <i>Solid Waste Treatment Technology</i>	3	3	0	Tiada/ <i>None</i>
ESC3204	Rawatan Air Sisa/ <i>Wastewater Treatment</i>	3	2	1	Tiada/ <i>None</i>
FST3110	Biokimia Makanan/ <i>Food Biochemistry</i>	3	3	0	Tiada/ <i>None</i>
PRT3403	Kimia dan Biokimia Pertanian/ <i>Agricultural Chemistry and Biochemistry</i>	4	3	1	Tiada/ <i>None</i>

i. Elektif Umum/ *General Electives* (6 Kredit/ *Credits*)

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T	PRASYARAT/ PREREQUISITE
LP_2101	Bahasa Global Asas/ <i>Basic Global Language</i>	3			Tiada/ <i>None</i>
	Elektif 1/ <i>Elective 1</i>	3			Tiada/ <i>None</i>

Nota/ Notes : Kr = Jam Kredit/ Credit Hour, K = Kuliah/ Lecture, A = Amali/ Laboratory, T = Tutorial

SKEMA PENGAJIAN/ STUDY SCHEME**TAHUN 1/ 1ST YEAR****SEMESTER 1/ 1ST SEMESTER**

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
CHY3003	Asas Keselamatan Makmal/ <i>Basic Laboratory Safety</i>	2	2	0
CHY3101	Kimia Fizik I/ <i>Physical Chemistry I</i>	4	3	1
CHY3201	Kimia Organik I/ <i>Organic Chemistry I</i>	4	3	1
MTS3100	Kalkulus/ <i>Calculus</i>	3	3	0
SKP3112*	Falsafah dan Isu Semasa/ <i>Philosophy and Current Issues</i>	2	2	0
SKP3113**	Falsafah dan Isu Semasa Masyarakat Sivil/ <i>Philosophy and Current Issues in Civil Society</i>	3	3	0
atau/ or	atau/ or			
SKP3123**	Penghayatan Etika dan Peradaban di Malaysia/ <i>Internalization of Ethics and Civilization in Malaysia</i>	3	3	0
PRT2009	Pertanian dan Kehidupan/ <i>Agriculture and Life</i>	2	1	1
JUMLAH/ TOTAL		17/18	14/15	3

SEMESTER 2/ 2ND SEMESTER

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
CHY3301	Keberkalaan dan Ikatan Kimia/ <i>Periodicity and Chemical Bonding</i>	4	3	1
CHY3401	Kimia Analisis/ <i>Analytical Chemistry</i>	3	2	1
MGM3180	Asas Keusahawanan/ <i>Basic Entrepreneurship</i>	3	2	1
LPE2301	<i>Academic Interaction and Presentation</i>	3	3	0
SKP3122*	Penghayatan Etika dan Peradaban/ <i>Internalization of Ethics and Civilization</i>	2	2	0
LPM2100**	Bahasa Melayu Komunikasi/ <i>Malay Language Communication</i>	2	2	0
SKP2101*	Kenegaraan Malaysia/ <i>Malaysian Nationhood</i>	3	3	0
FEM2401**	Politik Malaysia dan Masyarakat/ <i>Malaysian Politics and Society</i>	2	2	0
JUMLAH/ TOTAL		17/18	14/15	3

TAHUN 2/ 2ND YEAR**SEMESTER 1/ 1ST SEMESTER**

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
CHY3102	Kimia Fizik II/ Physical Chemistry II	4	3	1
CHY3202	Kimia Organik II/ <i>Organic Chemistry II</i>	4	3	1
CHY3402	Spektroskopi Kimia/ <i>Chemical Spectroscopy</i>	4	3	1
LPE2501	<i>Academic Writing</i>	3	3	0
QKXxxxx	Ko-kurikulum/ <i>Co-curriculum</i>	1	0	1
JUMLAH/ TOTAL		16	12	4

SEMESTER 2/ 2ND SEMESTER

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
CHY3304	Struktur Pepejal & Kimia Koordinatan/ <i>Solid Structure and Coordination Chemistry</i>	4	3	1
CHY3601	Kimia Petroleum/ <i>Petroleum Chemistry</i>	3	3	0
LP_2101	Bahasa Global Asas/ <i>Basic Global Language</i>	3	3	0
QKXxxxx	Kokurikulum/ <i>Co-curriculum</i>	1	0	1
	Elektif/ <i>Electives</i>	6		
JUMLAH/ TOTAL		17		

TAHUN 3/ 3RD YEAR**SEMESTER 1/ 1ST SEMESTER**

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
CHY3504	Prinsip Teknologi Kimia/ <i>Chemical Technology Principles</i>	4	4	0
CHY3602	Proses Penapisan Petroleum/ <i>Petroleum Refining Processes</i>	3	3	0
CHY4601	Pemangkinan heterogen/ <i>Heterogeneous Catalysis</i>	3	2	1
	Elektif/ <i>Electives</i>	8		
JUMLAH/ TOTAL		18		

SEMESTER 2/ 2ND SEMESTER

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
CHY3603	Petrokimia dari Hidrokarbon Ringan/ <i>Petrochemicals from Light Hydrocarbon</i>	3	3	0
CHY3605	Kawalan Tumpahan Minyak/ <i>Oil Spill Control</i>	3	3	0
CHY4959A	Disertasi Bachelo/ <i>Bachelor Dissertation</i>	3	0	3
	Elektif/ <i>Elective</i>	8		
JUMLAH/ TOTAL		17		

TAHUN 4/ 4TH YEAR
SEMESTER 1/ 1ST SEMESTER

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
CHY3604	Petrokimia dari Sebatian Aromatik/ <i>Petrochemicals from Aromatics Compounds</i>	3	3	0
CHY3606	Amali dalam Kimia Petroleum/ <i>Practical in Petroleum Chemistry</i>	1	0	1
CHY4959B	Disertasi Bachelo/ <i>Bachelor Dissertation</i>	3	0	3
	Elektif/ <i>Electives</i>	6		
JUMLAH/ TOTAL		13		

SEMESTER 2/ 2ND SEMESTER

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
CHY4903	Latihan Industri/ <i>Industrial Training</i>	8	0	8
JUMLAH/ TOTAL		8	0	8