

STRUKTUR KURIKULUM/ CURRICULUM STRUCTURE

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

Jumlah Kredit Bergraduat : **126 Jam Kredit/ Credit Hours**

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

Matlamat Program :

1. Melahirkan ahli kimia perindustrian yang kompeten dalam aspek teori dan praktikal bagi menerajui bidang 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	Kemahiran Praktikal	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 Perindustrian dengan Kepujian	36	18	26	8	8	9	11	5	5	6

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/ Philosophy and Current Issues	2	2	0	Tiada/ None

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

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

2. Kursus Teras/ Core Courses (75 Kredit/ Credits)

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T	PRASYARAT/ PREREQUISITE
CHY3003	Asas Keselamatan Makmal/ <i>Basic Laboratory Safety</i>	2	2	0	Tiada/ None
CHY3101	Kimia Fizik I/ <i>Physical Chemistry I</i>	4	3	1	Tiada/ None
CHY3102	Kimia Fizik II/ <i>Physical Chemistry II</i>	4	3	1	CHY3101
CHY3103	Kimia Polimer/ <i>Polymer Chemistry</i>	4	3	1	CHY3101
CHY3201	Kimia Organik I/ <i>Organic Chemistry I</i>	4	3	1	CHY2001 atau/ or setara/ equivalent
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/ equivalent
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
CHY3502	Kimia Organik Perindustrian/ <i>Industrial Organic Chemistry</i>	3	3	0	CHY3201
CHY3503	Kimia Tak Organik Perindustrian/ <i>Industrial Inorganic Chemistry</i>	3	3	0	CHY3304
CHY3504	Prinsip Teknologi Kimia/ <i>Chemical Technology Principles</i>	4	4	0	CHY3102
CHY3505	Plastik dan Komposit/	3	3	0	CHY3103

<i>Plastics and Composites</i>					
CHY3506	Oleokimia/ <i>Oleochemistry</i>	3	2	1	CHY3202
CHY3507	Kimia dan Teknologi Getah/ <i>Rubber Chemistry and Technology</i>	2	2	0	CHY3103
CHY4501	Keusahawanan Kimia/ <i>Chempreneurship</i>	3	3	0	CHY3501 atau/ or CHY3504
CHY4903	Latihan Industri/ <i>Industrial Training</i>	8	0	8	Kebenaran Jabatan/ Department Approval
CHY4959	Disertasi Bachelo/ <i>Bachelor Dissertation</i>	6	0	6	Kebenaran Jabatan/ Department Approval
MTS3100	Kalkulus/ <i>Calculus</i>	3	3	0	Tiada/ <i>None</i>

3. Kursus Elektif/ *Electives* (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/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T	PRASYARAT/ PREREQUISITE
CHY3203	Sintesis Organik/ <i>Organic Synthesis</i>	4	3	1	CHY3202 dan/ and CHY3402
CHY3204	Kimia Hasil Semula Jadi/ <i>Natural Products Chemistry</i>	4	3	1	CHY3202 dan/ and CHY3402
CHY3205	Kimia Protein/ <i>Protein Chemistry</i>	3	3	0	CHY3202 dan/ and CHY3402
CHY3508	Kimia Hijau/ <i>Green Chemistry</i>	3	2	1	CHY3402
CHY3602	Proses Penapisan Petroleum/ <i>Petroleum Refining Processes</i>	3	3	0	CHY3202
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
CHY4301	Kimia Keadaan Pepejal/ <i>Solid State Chemistry</i>	3	3	0	CHY3302 atau/ or CHY3304
CHY4401	Elektrokimia/ <i>Electrochemistry</i>	3	3	0	CHY3101 dan/ and CHY3401
CHY4402	Teknik Pemisahan/ <i>Separation Techniques</i>	3	3	0	CHY3401
CHY4403	Kimia Forensik/ <i>Forensic Chemistry</i>	3	3	0	CHY3402

CHY4601	Pemangkinan Heterogen/ <i>Heterogeneous Catalysis</i>	3	2	1	CHY3102
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iii. Elektif Opsyen/ *Optional Electives* (9 Kredit/ *Credits*)

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T	PRASYARAT/ PREREQUISITE
FSA4001	Sistem Pengurusan Kualiti dalam Sains/ <i>Quality Management System in Science</i>	3	3	0	Tiada/ <i>None</i>
FSA4002	Pengurusan Inovasi dan Teknologi untuk Saintis/ <i>Innovation and Technology Management for Scientist</i>	3	3	0	Tiada/ <i>None</i>
FST3302	Asas Pemprosesan dan Pengawetan Makanan/ <i>Fundamentals of Food Processing and Preservation</i>	3	3	0	Tiada/ <i>None</i>
ECH4410	Pemprosesan Bahan Nano/ <i>Nanomaterials Processing</i>	3	3	0	Tiada/ <i>None</i>
EPF4611	Teknologi Nutraseutikal/ <i>Nutraceutical Technology</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>
ESC4404	Teknologi Rawatan Sisa Berbahaya/ <i>Hazardous Waste Treatment Technology</i>	3	3	0	Tiada/ <i>None</i>
BTC3001	Pengenalan Kepada Bioteknologi/ <i>Introduction to Biotechnology</i>	2	2	0	Tiada/ <i>None</i>

ii. 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	3	0	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
PRT2009	Pertanian dan Kehidupan/ <i>Agriculture and Life</i>	2	1	1
SKP3112*	Falsafah dan Isu Semasa/ <i>Philosophy and Current Issues</i>	2	2	0
SKP3113** atau/or	Falsafah dan Isu Semasa Masyarakat Sipil/ <i>Philosophy and Current Issues in Civil Society</i> atau/or	3	3	0
SKP3123**	Penghayatan Etika dan Peradaban di Malaysia/ <i>Internalization of Ethics and Civilization in Malaysia</i>	3	3	0
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
SKP2101*	Kenegaraan Malaysia/ <i>Malaysian Nationhood</i>	3	3	0
FEM2401**	Politik Malaysia dan Masyarakat/ <i>Malaysian Politics and Society</i>	2	2	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
LPE2301	<i>Academic Interaction and Presentation</i>	3	3	0
JUMLAH/ TOTAL		17/18	14/15	3

TAHUN 2/ 2ND SEMESTER**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
CHY3103	Kimia Polimer/ Polymer Chemistry	4	3	1
CHY3402	Spektroskopi Kimia/ Chemical Spectroscopy	4	3	1
LPE2501	Academic Writing	3	3	0
QKXxxxx	Kokurikulum/ Co-curriculum	1	0	1
JUMLAH/ TOTAL		16	12	4

SEMESTER 2/ 2ND SEMESTER

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
CHY3202	Kimia Organik II/ Organic Chemistry II	4	3	1
CHY3304	Struktur Pepejal & Kimia Koordinatan/ Solid Structure and Coordination Chemistry	4	3	1
CHY3504	Prinsip Teknologi Kimia/ Chemical Technology Principles	4	4	0
QKXxxxx	Kokurikulum/ Co-curriculum	1	0	1
LP_2101	Bahasa Global Asas/ Basic Global Language	3	3	0
Elektif/ Elective		2		
JUMLAH/ TOTAL		18		

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

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
CHY3502	Kimia Organik Perindustrian/ Industrial Organic Chemistry	3	3	0
CHY3503	Kimia Tak Organik Perindustrian/ Industrial Inorganic Chemistry	3	3	0
CHY3505	Plastik dan Komposit/ Plastics and Composites	3	3	0
Elektif/ Electives		9		
JUMLAH/ TOTAL		18		

SEMESTER 2/ 2ND SEMESTER

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
CHY3506	Oleokimia/ <i>Oleochemistry</i>	3	2	1
CHY3507	Kimia dan Teknologi Getah/ <i>Rubber Chemistry and Technology</i>	2	2	0
CHY4959A	Disertasi Bachelo/ <i>Bachelor Dissertation</i>	3	0	3
	Elektif/ <i>Elective</i>	9		
JUMLAH/ TOTAL		17		

TAHUN 4/ 4TH YEAR

SEMESTER 1/ 1ST SEMESTER

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
CHY4501	Keusahawanan Kimia/ <i>Chempreneurship</i>	3	3	0
CHY4959B	Disertasi Bachelo/ <i>Bachelor Dissertation</i>	3	0	3
	Elektif/ <i>Elective</i>	8		
JUMLAH/ TOTAL		14		

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