

STRUKTUR KURIKULUM/ CURRICULUM STRUCTURE

Nama Program : **Bachelor Sains Fizik Bahan dengan Kepujian/**
Bachelor of Science in Materials Physics with Honours

Jumlah Kredit Bergraduat : **122 Jam Kredit/ Credit Hours**

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

Matlamat Program :

1. Ahli fizik bahan yang kompeten dalam aspek teori dan praktikal serta berdaya saing bagi menerajui bidang berasaskan sains bahan
2. Penyelidik yang berpengetahuan dan berkemahiran tinggi bagi tujuan inovasi dan pengajian lanjutan
3. 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 Fizik Bahan dengan Kepujian	40	12	25	14	12	10	11	6	4	4

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

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T	PRASYARAT/ PREREQUISITE
PRT2009	Pertanian dan Kehidupan/ <i>Agriculture and Life</i>	2	1	1	Tiada/ None
SKP2101*	Kenegaraan Malaysia/ <i>Malaysian Nationhood</i>	3	3	0	Tiada/ None
FEM2401**	Politik Malaysia dan Masyarakat/ <i>Malaysian Politics and Society</i>	2	2	0	Tiada/ None
SKP3112*	Falsafah dan Isu Semasa/ <i>Philosophy and Current Issues</i>	2	2	0	Tiada/ None
SKP3113**	Falsafah dan Isu Semasa Masyarakat Sivil/ <i>Philosophy and Current Issues in Civil Society</i>	3	3	0	Tiada/ None

<i>atau/or</i>	<i>atau/or</i>				
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
LPE2301	<i>Academic Interaction and Presentation</i>	3	3	0	LPE2401/ MUET Band 3/4
LPE2501	<i>Academic Writing</i>	3	3	0	LPE2301
MGM3180	Asas Keusahawanan/ <i>Basic Entrepreneurship</i>	3	2	1	Tiada/ None
QKXxxxx	Kokurikulum/ <i>Co-Curriculum</i>	1	0	1	Tiada/ None
QKXxxxx	Kokurikulum/ <i>Co-Curriculum</i>	1	0	1	Tiada/ None

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

5. Kursus Teras/ *Core Courses* (69 Kredit/ *Credits*)

KOD KURSUS/ <i>COURSE CODE</i>	NAMA KURSUS/ <i>COURSE NAME</i>	Kr	K	A/T	PRASYARAT/ <i>PREREQUISITE</i>
PHY3001	Mekanik/ <i>Mechanics</i>	3	3	0	Tiada/ None
PHY3002	Keelektrikan dan Kemagnetan/ <i>Electricity and Magnetism</i>	3	3	0	Tiada/ None
MTS3100	Kalkulus/ <i>Calculus</i>	3	3	0	Tiada/ None
CSC3100	Penyelesaian Masalah dan Konsep Pengaturcaraan/ <i>Problem Solving and Programming Concepts</i>	3	2	1	Tiada/ None
PHY3105	Fizik Moden/ <i>Modern Physics</i>	3	3	0	Tiada/ None
PHY3200	Fizik Bahan/ <i>Materials Physics</i>	3	3	0	Tiada/ None
PHY3201	Fizik Keadaan Pepejal/ <i>Solid State Physics</i>	3	3	0	Tiada/ None
PHY3209	Termodinamik/ <i>Thermodynamics</i>	3	3	0	Tiada/ None
PHY3306	Elektronik/ <i>Electronics</i>	4	3	1	Tiada/ None
PHY3400	Optik/ <i>Optics</i>	3	0	0	Tiada/ None
PHY3401	Keelektromagnetan/ <i>Electromagnetism</i>	3	3	0	Tiada/ None
PHY3600	Kaedah Matematik dalam Fizik I/ <i>Mathematical Methods in Physics I</i>	3	3	0	Tiada/ None
PHY3901	Amali Mekanik dan Fizik Terma/ <i>Mechanics and Thermal Physics Laboratory</i>	1	0	1	Tiada/ None
PHY3902	Amali Keelektromagnetan dan Optik/ <i>Electromagnetism and Optics Laboratory</i>	1	0	1	Tiada/ None
PHY3903	Pendedahan Awal kepada Industri/ <i>Early Exposure to Industry</i>	1	0	1	Tiada/ None

PHY3921	Sintesis dan Pencirian Bahan I/ <i>Materials Synthesis and Characterization I</i>	1	0	1	PHY3200
PHY3922	Sintesis dan Pencirian Bahan II/ <i>Materials Synthesis and Characterization II</i>	1	0	1	PHY3200
PHY3923	Fabrikasi dan Pencirian Filem / <i>Fabrication and Characterization of Films</i>	1	0	1	PHY3200
PHY4202	Peranti Semikonduktor/ <i>Semiconductor Devices</i>	3	3	0	Tiada/ None
PHY4211	Analisis Struktur dan Mikrostruktur/ <i>Structure and Microstructure Analysis</i>	3	3	0	PHY3201
PHY4212	Seramik, Polimer dan Komposit/ <i>Ceramic, Polymer and Composites</i>	3	3	0	PHY3201
PHY4213	Metalurgi/ <i>Metallurgy</i>	3	3	0	PHY3201
PHY4903	Latihan Industri/ <i>Industrial Training</i>	8	0	8	Tiada/ None
PHY4959	Disertasi Bachelior/ <i>Bachelor Dissertation</i>	6	0	6	Tiada/ None

6. Kursus Elektif/ *Elective Courses (33 Kredit/ Credits)*

Pelajar dikehendaki mengambil: (i) 15 kredit dari kursus yang tersenarai dalam Elektif Bidang, (ii) memilih satu pakej kursus dari Elektif Opsyen sebanyak 9 kredit dan (iii) mengambil kursus Elektif Umum sebanyak 9 kredit dengan persetujuan Ketua Jabatan/ *Students are required to take: (i) 15 credits of courses listed in Major Elective, (ii) choose a package of courses from Optional Elective with a total of 9 credits and (iii) take courses of General Elective with a total of 9 credits with the approval of the Head of Department*

iv. Elektif Bidang/ *Major Elective (15 Kredit/ Credits)*

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T	PRASYARAT/ PREREQUISITE
PHY3208	Kemagnetan dan Bahan Magnet/ <i>Magnetism and Magnetic Materials</i>	3	3	0	PHY3201
PHY4214	Sains Kakisan/ <i>Corrosion Science</i>	3	3	0	Tiada/ None
PHY4215	Bahan Nano/ <i>Nanomaterials</i>	3	3	0	PHY3200
PHY4216	Sains dan Teknologi Bahan Termaju/ <i>Science and Technology of Advanced Materials</i>	3	3	0	PHY3200
PHY4308	Prinsip dan Instrumentasi Ujian Tanpa Musnah/ <i>Principles and Instrumentation of Non-Destructive Testing</i>	3	3	0	Tiada/ None
FSA4001	Sistem Pengurusan Kualiti dalam Sains/ <i>Quality Management System in Science</i>	3	3	0	Tiada/ None

v. Elektif Opsyen/ *Optional Elective (9 Kredit/ Credits)*

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T	PRASYARAT/ PREREQUISITE
D. Teknologi Bahan/ <i>Materials Technology</i>					
PHY4207	Teknologi Pemprosesan Bahan/ <i>Materials Processing Technology</i>	3	3	0	Tiada/ None

PHY4210	Teknologi Semikonduktor/ <i>Semiconductor Technology</i>	3	3	0	Tiada/ None
PHY4217	Sains dan Teknologi Superkonduktor/ <i>Science and Technology of Superconductor</i>	3	3	0	PHY3201
Atau/ Or					
E. Optik Gunaan/ <i>Applied Optics</i>					
PHY4405	Optik Lanjutan dan Fizik Laser/ <i>Advanced Optics and Laser Physics</i>	3	3	0	PHY3400
PHY4406	Gentian Optik dan Optoelektronik/ <i>Fiber Optics and Optoelectronics</i>	3	3	0	PHY3400
PHY4407	Teknologi Bahan Fotonik/ <i>Photonics Material Technology</i>	3	3	0	Tiada/ None
Atau/ Or					
F. Fizik Jirim Terkondensasi/ <i>Condensed Matter Physics</i>					
PHY3601	Mekanik Kuantum/ <i>Quantum Mechanics</i>	3	3	0	PHY3105
PHY4201	Fizik Keadaan Pepejal Lanjutan/ <i>Advanced Solid State Physics</i>	3	3	0	PHY3201
PHY4605	Kaedah Pengkomputeran dalam Fizik/ <i>Computational Method in Physics</i>	3	2	1	PHY3600
vi. Elektif Umum/ <i>General Elective</i> (9 Kredit/ credits)					
KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T	PRASYARAT/ PREREQUISITE
	Bahasa Global/ <i>Global Language</i>	3			Tiada/ None
	Elektif 1/ <i>Elective 1</i>	3			Tiada/ None
	Elektif 2/ <i>Elective 2</i>	3			Tiada/ None

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
PHY3001	Mekanik/ <i>Mechanics</i>	3	3	0
MTS3100	Kalkulus/ <i>Calculus</i>	3	3	0
PHY3200	Fizik Bahan/ <i>Materials Physics</i>	3	3	0
PHY3901	Amali Mekanik dan Fizik Terma/ <i>Mechanics and Thermal Physics Laboratory</i>	1	0	1
PRT2009	Pertanian dan Kehidupan/ <i>Agriculture and Life</i>	2	1	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
JUMLAH/ TOTAL		17	15	2

SEMESTER 2/ 2ND SEMESTER

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
PHY3002	Keelektrikan dan Kemagnetan/ <i>Electricity and Magnetism</i>	3	3	0
PHY3400	Optik/ <i>Optics</i>	3	0	0
PHY3600	Kaedah Matematik dalam Fizik I/ <i>Mathematical Methods in Physics I</i>	3	3	0
PHY3902	Amali Keelektromagnetan dan Optik/ <i>Electromagnetism and Optics Laboratory</i>	1	0	1
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
LPE2301	<i>Academic Interaction and Presentation</i>	3	3	0

QKXxxxx	Kokurikulum/ <i>Co-Curriculum</i>	1	0	1
JUMLAH/ TOTAL		16	14	2

TAHUN 2/ 2ND YEAR

SEMESTER 1/ 1ST SEMESTER

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
PHY3105	Fizik Modern/ <i>Modern Physics</i>	3	3	0
PHY3201	Fizik Keadaan Pepejal/ <i>Solid State Physics</i>	3	3	0
PHY3209	Termodinamik/ <i>Thermodynamics</i>	3	3	0
PHY3306	Elektronik/ <i>Electronics</i>	4	3	1
LPE2501	<i>Academic Writing</i>	3	3	0
QKXxxxx	Kokurikulum/ <i>Co-Curriculum</i>	1	0	1
JUMLAH/ TOTAL		17	15	2

SEMESTER 2/ 2ND SEMESTER

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
PHY3401	Keelektromagnetan/ <i>Electromagnetism</i>	3	3	0
PHY3921	Sintesis dan Pencirian Bahan I/ <i>Materials Synthesis and Characterization I</i>	1	0	1
PHY4202	Peranti Semikonduktor/ <i>Semiconductor Devices</i>	3	3	0
PHY4211	Analisis Struktur dan Mikrostruktur/ <i>Structure and Microstructure Analysis</i>	3	3	0
PHY4213	Metalurgi/ <i>Metallurgy</i>	3	3	0
CSC3100	Penyelesaian Masalah dan Konsep Pengaturcaraan/ <i>Problem Solving and Programming Concepts</i>	3	2	1
	Elektif Umum (Bahasa Global)/ <i>General Elective (Global Language)</i>	3		
JUMLAH/ TOTAL		19		

TAHUN 3/ 3RD YEAR

SEMESTER 1/ 1ST SEMESTER

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
PHY3922	Sintesis dan Pencirian Bahan II/ <i>Materials Synthesis and Characterization II</i>	1	0	1
PHY4212	Seramik, Polimer dan Komposit/ <i>Ceramic, Polymer and Composites</i>	3	3	0
	Elektif Bidang/ <i>Major Elective</i>	6		
	Elektif Umum/ <i>General Elective</i>	6		

JUMLAH/ TOTAL	16
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SEMESTER 2/ 2ND SEMESTER

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
PHY4959A	Disertasi Bachelo/ <i>Bachelor Dissertation</i>	3	0	3
PHY3923	Fabrikasi dan Pencirian Filem/ <i>Fabrication and Characterization of Films</i>	1	0	1
MGM3180	Asas Keusahawanan/ <i>Basic Entrepreneurship</i>	3	2	1
	Elektif Bidang/ <i>Major Elective</i>	9		
JUMLAH/ TOTAL		16		

TAHUN 4/ 4TH YEAR

SEMESTER 1/ 1ST SEMESTER

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
PHY4959B	Disertasi Bachelo/ <i>Bachelor Dissertation</i>	3	0	3
PHY3903	Pendedahan Awal kepada Industri/ <i>Early Exposure to Industry</i>	1	0	1
	Elektif Opsyen/ <i>Optional Elective</i>	9		
JUMLAH/ TOTAL		13		

SEMESTER 2/2ND SEMESTER

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
PHY4903	Latihan Industri/ <i>Industrial Training</i>	8	0	8
JUMLAH/ TOTAL		8	0	8