

STRUKTUR KURIKULUM/ CURRICULUM STRUCTURE

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

Jumlah Kredit Bergraduat : **120 Jam Kredit/ Credit Hours**

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

Matlamat Program :

1. Ahli fizik yang kompeten dalam aspek teori dan praktikal serta berdaya saing bagi menerajui bidang berasaskan sains fizik
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 dengan Kepujian	38	11	19	12	10	10	16	5	4	5

1. 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** atau/or	Falsafah dan Isu Semasa Masyarakat Sivil/ <i>Philosophy and Current Issues in Civil Society</i> atau/or	3	3	0	Tiada/ None

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

2. Kursus Teras/ Core Courses (67 Kredit/ Credits)

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T	PRASYARAT/ PREREQUISITE
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
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
PHY3601	Mekanik Kuantum/ <i>Quantum Mechanics</i>	3	3	0	PHY3105
PHY3602	Mekanik Statistik/ <i>Statistical Mechanics</i>	3	3	0	PHY3105
PHY3603	Mekanik Klasik/ <i>Classical Mechanics</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
PHY4600	Kaedah Matematik dalam Fizik II/ <i>Mathematical Methods in Physics II</i>	3	3	0	PHY3600
PHY4605	Kaedah Pengkomputeran dalam Fizik/ <i>Computational Method in Physics</i>	3	2	1	PHY3600
PHY4900	Amali Lanjutan dalam Fizik/ <i>Advanced Practical in Physics</i>	1	0	1	PHY3105
PHY4903	Latihan Industri/ <i>Industrial Training</i>	8	0	8	Tiada/ None
PHY4959	Disertasi Bacelor/ <i>Bachelor Dissertation</i>	6	0	6	Tiada/ None

3. 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*

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

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T	PRASYARAT/ PREREQUISITE
PHY3701	Astronomi/ <i>Astronomy</i>	3	3	0	Tiada/ None
PHY4401	Keelektromagnetan Gunaan/ <i>Applied Electromagnetism</i>	3	3	0	PHY3401
PHY4405	Optik Lanjutan dan Fizik Laser/ <i>Advanced Optics and Laser Physics</i>	3	3	0	PHY3400
PHY4502	Fizik Sinaran dan Radiobiologi/ <i>Radiation Physics and Radiobiology</i>	3	3	0	PHY3105
PHY4505	Fizik Perubatan/ <i>Medical Physics</i>	3	3	0	Tiada/ None
PHY4506	Fizik Zarah dan Nuklear/ <i>Nuclear and Particle Physics</i>	3	3	0	PHY3105
FSA4001	Sistem Pengurusan Kualiti dalam Sains/ <i>Quality Management System in Science</i>	3	3	0	Tiada/ None

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

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T	PRASYARAT/ PREREQUISITE
A. Fizik Teori/ <i>Theoretical Physics</i>					
PHY4503	Kerelatifan Khas dan Teori Medan Klasik/ <i>Special Relativity and Classical Field Theory</i>	3	3	0	PHY3105
PHY4603	Mekanik Kuantum Lanjutan/ <i>Advanced Quantum Mechanics</i>	3	3	0	PHY3601
PHY4404	Maklumat dan Teknologi Kuantum/ <i>Quantum Information and Technology</i>	3	3	0	PHY3601

Atau/ Or					
B. Fizik Gunaan (Elektronik)/ <i>Applied Physics (Electronics)</i>					
PHY4301	Mikroprosesor dan Mikrokomputer/ <i>Microprocessor and Microcomputer</i>	3	3	0	PHY3306
PHY4306	Elektronik Lanjutan/ <i>Advanced Electronics</i>	3	3	0	PHY3306
PHY4406	Gentian Optik dan Optoelektronik/ <i>Fiber Optics and Optoelectronics</i>	3	3	0	PHY3400

Atau/ Or					
C. Fizik Gunaan (Bahan)/ <i>Applied Physics (Materials)</i>					
PHY3200	Fizik Bahan/ <i>Materials Physics</i>	3	3	0	Tiada/ None
PHY4202	Peranti Semikonduktor/ <i>Semiconductor Devices</i>	3	3	0	Tiada/ None
PHY4207	Teknologi Pemprosesan Bahan/ <i>Materials Processing Technology</i>	3	3	0	Tiada/ None

iii. Elektif Umum/ *General Elective* (9 Kredit/ credits)

KOD KURSUS/ <i>COURSE CODE</i>	NAMA KURSUS/ <i>COURSE NAME</i>	Kr	K	A/T	PRASYARAT/ <i>PREREQUISITE</i>
	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
PHY3600	Kaedah Matematik dalam Fizik I/ <i>Mathematical Methods in Physics I</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
PHY3105	Fizik Modern/ <i>Modern Physics</i>	3	3	0
PHY3400	Optik/ <i>Optics</i>	3	0	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
PHY3209	Termodinamik/ <i>Thermodynamics</i>	3	3	0
PHY3306	Elektronik/ <i>Electronics</i>	4	3	1
PHY3401	Keelektromagnetan/ <i>Electromagnetism</i>	3	3	0
PHY4600	Kaedah Matematik dalam Fizik II/ <i>Mathematical Methods in Physics II</i>	3	3	0
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
PHY3201	Fizik Keadaan Pepejal/ <i>Solid State Physics</i>	3	3	0
PHY3601	Mekanik Kuantum/ <i>Quantum Mechanics</i>	3	3	0
PHY3602	Mekanik Statistik/ <i>Statistical Mechanics</i>	3	3	0
PHY4605	Kaedah Pengkomputeran dalam Fizik/ <i>Computational Method in Physics</i>	3	2	1
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		18		

TAHUN 3/ 3RD YEAR

SEMESTER 1/ 1ST SEMESTER

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
PHY3603	Mekanik Klasik/ <i>Classical Mechanics</i>	3	3	0
PHY4900	Amali Lanjutan dalam Fizik/ <i>Advanced Practical in Physics</i>	1	0	1
	Elektif Bidang/ <i>Major Elective</i>	6		
	Elektif Umum/ <i>General Elective</i>	6		
JUMLAH/ TOTAL		16		

SEMESTER 2/ 2ND SEMESTER

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
PHY4959A	Disertasi Bacelor/ <i>Bachelor Dissertation</i>	3	0	3
MGM3180	Asas Keusahawanan/ <i>Basic Entrepreneurship</i>	3	2	1
	Elektif Bidang/ <i>Major Elective</i>	9		
	JUMLAH/ TOTAL	15		

TAHUN 4/ 4TH YEAR

SEMESTER 1/ 1ST SEMESTER

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
PHY4959B	Disertasi Bacelor/ <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