

STRUKTUR KURIKULUM/ CURRICULUM OUTLINE

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

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

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

Matlamat Program :

1. Melahirkan ahli fizik yang berpengetahuan tinggi dalam aspek teori dan praktikal serta berdaya saing dalam industri berkaitan fizik dalam negara mahupun di peringkat global
2. Melahirkan penyelidik berpengetahuan dan berkemahiran tinggi bagi tujuan inovasi dan pengajian lanjutan
3. Melahirkan graduan yang beretika dan berintegriti dalam bidang yang diceburi

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 (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	35	9	27	11	6	7	16	4	5	5

1. Kursus Universiti/ University Courses (25 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
FEM2310**	Nilai, Budaya dan Masyarakat Malaysia/ <i>Malaysian Values, Culture 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</i>	3	3	0	Tiada/ None

atau/or	<i>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>				
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
FCE3204	Kemahiran Berfikir/ <i>Thinking Skills</i>	2	2	0	Tiada/ None
KOM3403	Pengucapan Awam/ <i>Public Oration</i>	3	3	0	Tiada/ None
QKK2101	Bakti Siswa	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* (66 Kredit/ *Credits*)

KOD KURSUS/ <i>COURSE CODE</i>	NAMA KURSUS/ <i>COURSE NAME</i>	Kr	K	A/T	PRASYARAT/ <i>PREREQUISITE</i>
PHY3103	Fizik I/ <i>Physics I</i>	4	3	1	Tiada/ None
PHY3104	Fizik II/ <i>Physics II</i>	4	3	1	Tiada/ None
MTH3100	Kalkulus/ <i>Calculus</i>	3	3	0	Tiada/ None
MTH3200	Aljabar/ <i>Algebra</i>	3	3	0	Tiada/ None
MTH3102	Persamaan Pembezaan/ <i>Differential Equations</i>	3	3	0	MTH3100 dan MTH3200
SSK3100	Pengaturcaraan Komputer 1/ <i>Computer Programming I</i>	4	3	1	Tiada/ None
PHY3105	Fizik Moden/ <i>Modern Physics</i>	3	3	0	PHY3103 dan PHY3104
PHY3201	Fizik Keadaan Pepejal/ <i>Solid State Physics</i>	3	3	0	PHY3103 dan PHY3104
PHY3306	Elektronik/ <i>Electronics</i>	4	3	1	Tiada/ None
PHY3401	Keelektromagnetan/ <i>Electromagnetism</i>	3	3	0	PHY3103 dan PHY3104
PHY3601	Mekanik Kuantum/ <i>Quantum Mechanics</i>	3	3	0	PHY3105
PHY3602	Mekanik Statistik/ <i>Statistical Mechanics</i>	3	3	0	Tiada/ None
PHY3603	Mekanik Klasik/ <i>Classical Mechanics</i>	3	3	0	PHY3103 dan PHY3104
PHY3604	Kaedah Matematik dalam Fizik/	3	3	0	PHY3103 dan

	<i>Mathematical Methods in Physics</i>				PHY3104
PHY4403	Optik Geometri dan Gelombang/ <i>Geometrical and Wave Optics</i>	3	3	0	PHY3104
PHY4903	Latihan Industri/ <i>Industrial Training</i>	8	0	8	PHY4959
PHY4995	Amali Lanjutan Fizik/ <i>Advanced Physics Practicals</i>	3	0	3	PHY3105
PHY4959	Disertasi Bacelor/ <i>Bachelor Dissertation</i>	6	0	6	Tiada/ None

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

Pelajar mesti memilih sekurang-kurangnya 24 kredit daripada kursus dalam senarai Elektif Jabatan, 3 Kredit Elektif Bahasa dan 6 kredit daripada kursus Elektif Bebas yang dipersetujui oleh Jabatan untuk melengkapkan 33 kredit kursus elektif/ *Students must choose at least 24 credits listed in the departmental electives courses, 3 credits Language Elective and 6 credits courses approved by the department to complete the 33 credits of elective courses .*

i. Elektif Jabatan/ *Departmental Electives* (24 Kredit/ *Credits*)

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T	PRASYARAT/ PREREQUISITE
MTH3103	Analisis Vektor/ <i>Vector Analysis</i>	3	3	0	MTH3100
MTH3302	Analisis Kompleks/ <i>Complex Analysis</i>	3	3	0	MTH3101
PHY3209	Termodinamik/ <i>Thermodynamics</i>	3	3	0	PHY3103
PHY4201	Fizik Keadaan Pepejal Lanjutan/ <i>Advanced Solid State Physics</i>	3	3	0	PHY3201
PHY4202	Peranti Semikonduktor/ <i>Semiconductor Devices</i>	3	3	0	PHY3201
PHY4203	Sains Bahan/ <i>Materials Science</i>	3	3	0	PHY3103 dan PHY3104
PHY4207	Teknologi Pemprosesan Bahan/ <i>Materials Processing Technology</i>	3	3	0	PHY3201
PHY4301	Mikroprosesor dan Mikrokomputer/ <i>Microprocessor and Microcomputer</i>	3	3	0	PHY3306
PHY4401	Keelektromagnetan Gunaan/ <i>Applied Electromagnetism</i>	3	3	0	PHY3401
PHY4404	Optoelektronik dan Fotonik/ <i>Optoelectronics and Photonics</i>	3	3	0	PHY4403
PHY4502	Fizik Sinaran dan Radiobiologi/ <i>Radiation Physics and Radiobiology</i>	3	3	0	PHY3105
PHY4503	Kerelatifan Khas dan Teori Medan Klasik/ <i>Special Relativity & Classical Field Theory</i>	3	3	0	PHY3103 dan PHY3104
PHY4504	Fizik Nuklear/ <i>Nuclear Physics</i>	3	3	0	PHY3105
PHY4601	Fizik Matematik/ <i>Mathematical Physics</i>	3	3	0	PHY3604
PHY4602	Fizik Pengkomputeran/ <i>Computational Physics</i>	4	3	1	MTH3100
PHY4603	Mekanik Kuantum Lanjutan/ <i>Advanced Quantum Mechanics</i>	3	3	0	PHY3601

PHY4902	Tajuk Khas/ <i>Special Topics</i>	3	3	0	PHY3105
FSA4001	Sistem Pengurusan Kualiti dalam Sains/ <i>Quality Management System in Science</i>	3	3	0	Tiada/ None
FSA4002	Pengurusan Inovasi dan Teknologi untuk Sainis/ <i>Inovation and Technology Management for Scientist</i>	3	3	0	Tiada/ None

ii. Elektif Bahasa/ *Language Elective (3 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

iii. Elektif Bebas/ *General Electives (6 Kredit/ credits)*

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T	PRASYARAT/ PREREQUISITE
	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
PHY3103	Fizik I/ <i>Physics I</i>	4	3	1
MTH3100	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
SKP2101*	Kenegaraan Malaysia/ <i>Malaysian Nationhood</i>	3	3	0
FEM2310**	Nilai, Budaya dan Masyarakat Malaysia/ <i>Malaysian Values, Culture 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
FCE3204	Kemahiran Berfikir/ <i>Thinking Skills</i>	2	2	0
	JUMLAH/ TOTAL	16	15	1

SEMESTER 2/ 2ND SEMESTER

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
PHY3104	Fizik II/ <i>Physics II</i>	4	3	1
MTH3200	Aljabar/ <i>Algebra</i>	3	3	0
PRT2009	Pertanian dan Kehidupan/ <i>Agriculture and Life</i>	2	1	1
LPE2301	<i>Academic Interaction and Presentation</i>	3	3	0
KOM3403	Pengucapan Awam/ <i>Public Oratation</i>	3	3	0
QKXxxxx	Kokurikulum/ <i>Co-Curriculum</i>	1	0	1
	JUMLAH/ TOTAL	16	13	3

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

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
PHY3105	Fizik Moden/ <i>Modern Physics</i>	3	3	0
PHY3604	Kaedah Matematik dalam Fizik/ <i>Mathematical Methods in Physics</i>	3	3	0
MTH3102	Persamaan Pembezaan/ <i>Differential Equations</i>	3	3	0
PHY3306	Elektronik/ <i>Electronics</i>	4	3	1
LPE2501	<i>Academic Writing</i>	3	3	0
QKK2101	Bakti Siswa	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
PHY3401	Keelektromagnetan/ <i>Electromagnetism</i>	3	3	0
PHY3601	Mekanik Kuantum/ <i>Quantum Mechanics</i>	3	3	0
PHY4403	Optik Geometri dan Gelombang/ <i>Geometrical and Wave Optics</i>	3	3	0
MGM3180	Asas Keusahawanan/ <i>Basic Entrepreneurship</i>	3	2	1
	Elektif/ <i>Elective</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
PHY3602	Mekanik Statistik/ <i>Statistical Mechanics</i>	3	3	0
PHY3603	Mekanik Klasik/ <i>Classical Mechanics</i>	3	3	0
SSK3100	Pengaturcaraan Komputer 1/ <i>Computer Programming I</i>	4	3	1
PHY4995	Amali Lanjutan Fizik/ <i>Advanced Physics Practicals</i>	3	0	3
	Elektif/ <i>Elective</i>	3		
JUMLAH/ TOTAL		16		

SEMESTER 2/ 2ND SEMESTER

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
PHY4959A	Disertasi Bachelor/ <i>Bachelor Dissertation</i>	3	0	3
	Elektif/ <i>Elective</i>	15		
	JUMLAH/ TOTAL	18		

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

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
PHY4959B	Disertasi Bachelor/ <i>Bachelor Dissertation</i>	3	0	3
	Elektif/ <i>Elective</i>	12		
	JUMLAH/ TOTAL	15		

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