

## STRUKTUR KURIKULUM/ CURRICULUM STRUCTURE

- Nama Program** : **Bachelor Sains dalam Sains Instrumentasi dengan Kepujian/ Bachelor of Science in Instrumentation Science with Honours**
- Jumlah Kredit Bergraduat** : **124 Jam Kredit / Credit Hours**
- Tempoh Pengajian** : **8 Semester/ Semesters (4 Tahun/ Years)**
- Matlamat Program** :
1. Melahirkan ahli instrumentasi yang berpengetahuan tinggi dalam aspek teori dan praktikal serta berdaya saing dalam industri berkaitan instrumentasi 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 dalam Sains Instrumentasi dengan Kepujian	33	14	25	9	5	7	11	3	5	5

### 1. Kursus Universiti/ University Courses (25 Kredit/ credits)

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T	PRASARAT/ 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**	<i>Falsafah dan Isu Semasa Masyarakat Sivil/ Philosophy and Current Issues in Civil Society</i>	3	3	0	Tiada/ None
atau/or	<i>Atau/or</i>				
SKP3123**	<i>Penghayatan Etika dan Peradaban di Malaysia/ Internalization of Ethics and Civilization in Malaysia</i>	3	3	0	Tiada/ None
SKP3122*	<i>Penghayatan Etika dan Peradaban/ Internalization of Ethics and Civilization</i>	2	2	0	Tiada/ None
LPM2100**	<i>Bahasa Melayu Komunikasi/ 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	<i>Asas Keusahawanan/ Basic Entrepreneurship</i>	3	2	1	Tiada/ None
FCE3204	<i>Kemahiran Berfikir/ Thinking Skills</i>	2	2	0	Tiada/ None
KOM3403	<i>Pengucapan Awam/ Public Oration</i>	3	3	0	Tiada/ None
QKK2101	<i>Bakti Siswa</i>	1	0	1	Tiada/ None
QKXxxxx	<i>Kokurikulum/ 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
PHY3103	<i>Fizik I/ Physics I</i>	4	3	1	Tiada/ None
PHY3104	<i>Fizik II/ Physics II</i>	4	3	1	Tiada/ None
MTH3100	<i>Kalkulus/ Calculus</i>	3	3	0	Tiada/ None
MTH3200	<i>Aljabar/ Algebra</i>	3	3	0	Tiada/ None
SSK3100	<i>Pengaturcaraan Komputer 1/ Computer Programming I</i>	4	3	1	Tiada/ None
PHY3105	<i>Fizik Moden/ Modern Physics</i>	3	3	0	PHY3103 dan PHY3104
PHY3306	<i>Elektronik/ Electronics</i>	4	3	1	Tiada/ None
PHY3303	<i>Sensor dan Transduser/ Sensors and Transducers</i>	4	3	1	PHY3306
PHY3304	<i>Prinsip Sistem Pengukuran/ Principle of Measurement System</i>	4	3	1	PHY3103 dan PHY3104
PHY3401	<i>Keelektromagnetan/ Electromagnetism</i>	3	3	0	PHY3103 dan PHY3104
PHY4301	<i>Mikroprosesor &amp; Mikrokomputer/ Microprocessor and microcomputer</i>	3	3	0	PHY3306

PHY4302	Rekabentuk Peralatan Elektronik/ <i>Design of Electronic Equipment</i>	4	3	1	PHY3306
PHY4303	Pengantaramukaan Komputer dan Kawalan/ <i>Computer Interfacing and Control</i>	4	3	1	PHY3306
PHY4305	Instrumentasi Lanjutan	3	3	0	PHY3304
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
PHY4959	Disertasi Bachelo/ <i>Bachelor Dissertation</i>	6	0	6	Tiada/ None

3. Kursus Elektif/ *Elective Courses* (32 Kredit/ *credits*)

Pelajar mesti memilih sekurang-kurangnya 23 kredit daripada kursus dalam senarai Elektif Jabatan, 3 kredit daripada kursus Elektif Bahasa dan 6 kredit daripada Kursus Elektif Bebas yang dipersetujui oleh Jabatan untuk melengkapkan 32 kredit kursus elektif/

*Students must choose at least 23 credits listed in the departmental electives courses, 3 credits Language Elective and 6 credits courses approved by the department to complete the 32 credits of elective courses.*

i. Elektif Jabatan/ *Department Electives* (23 Kredit/ *credits*)

KOD KURSUS/ <i>COURSE CODE</i>	NAMA KURSUS/ <i>COURSE NAME</i>	Kr	K	A/T	PRASYARAT/ <i>PREREQUISITE</i>
PHY3201	Fizik Keadaan Pepejal/ <i>Solid State Physics</i>	3	3	0	PHY3103 dan PHY3104
PHY3209	Termodinamik/ <i>Thermodynamics</i>	3	3	0	PHY3103
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
PHY4304	Sistem Mikropengawal dan Rekabentuk/ <i>Microcontroller Systems and Design</i>	4	3	1	PHY3303
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
PHY4602	Fizik Pengkomputeran/ <i>Computational Physics</i>	4	3	1	MTH3100
PHY4995	Amali Lanjutan Fizik/ <i>Advanced Physics Practicals</i>	3	0	3	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 Saintis / <i>Innovation 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			

iii. Elektif Bebas/ *General Elective (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			

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

**SKEMA PENGAJIAN/ STUDY SCHEME**

**TAHUN 1/ 1<sup>ST</sup> YEAR**

**SEMESTER 1/ 1<sup>ST</sup> SEMESTER**

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
PHY3104	Fizik II/ <i>Physics II</i>	4	3	1
MTH3100	Kalkulus/ <i>Calculus</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
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
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
<b>JUMLAH/ TOTAL</b>		<b>16</b>	<b>15</b>	<b>1</b>

SEMESTER 2/ 2<sup>ND</sup> SEMESTER

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
PHY3103	Fizik I/ <i>Physics I</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 Oration</i>	3	3	0
QKXxxxx	Kokurikulum/ <i>Co-Curriculum</i>	1	0	1
<b>JUMLAH/ TOTAL</b>		<b>16</b>	<b>13</b>	<b>3</b>

TAHUN 2/ 2<sup>ND</sup> YEARSEMESTER 1/ 1<sup>ST</sup> SEMESTER

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
PHY3105	Fizik Moden/ <i>Modern Physics</i>	3	3	0
PHY4403	Optik Geometri dan Gelombang/ <i>Geometrical and Wave Optics</i>	3	3	0
PHY3401	Keelektromagnetan/ <i>Electromagnetism</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
<b>JUMLAH/ TOTAL</b>		<b>17</b>	<b>15</b>	<b>2</b>

SEMESTER 2/ 2<sup>ND</sup> SEMESTER

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
PHY3303	Sensor dan Transduser/ <i>Sensors and Transducers</i>	4	3	1
PHY3304	Prinsip Sistem Pengukuran/ <i>Principle of Measurement System</i>	4	3	1
PHY4301	Mikroprosesor & Mikrokomputer/ <i>Microprocessor and microcomputer</i>	3	3	0
MGM3180	Asas Keusahawanan/ <i>Basic Entrepreneurship</i>	3	2	1
	Elektif / <i>Elective</i>	3		
<b>JUMLAH/ TOTAL</b>		<b>17</b>		

**TAHUN 3/ 3<sup>RD</sup> YEAR**SEMESTER 1/ 1<sup>ST</sup> SEMESTER

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
PHY4303	Pengantaramukaan Komputer dan Kawalan/ <i>Computer Interfacing and Control</i>	4	3	1
SSK3100	Pengaturcaraan Komputer 1/ <i>Computer Programming I</i>	4	3	1
	Elektif / <i>Elective</i>	10		
	<b>JUMLAH/ TOTAL</b>	<b>18</b>		

SEMESTER 2/ 2<sup>ND</sup> SEMESTER

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
PHY4959A	Disertasi Bacelor/ <i>Bachelor Dissertation</i>	3	0	3
PHY4302	Rekabentuk Peralatan Elektronik/ <i>Design of Electronic Equipment</i>	4	3	1
PHY4305	Instrumentasi Lanjutan/ <i>Advanced Instrumentation</i>	3	3	0
	Elektif/ <i>Elective</i>	6		
	<b>JUMLAH/ TOTAL</b>	<b>16</b>		

**TAHUN 4/ 4<sup>TH</sup> YEAR**SEMESTER 1/ 1<sup>ST</sup> SEMESTER

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
PHY4959B	Disertasi Bacelor/ <i>Bachelor Dissertation</i>	3	0	3
	Elektif/ <i>Elective</i>	13		
	<b>JUMLAH/ TOTAL</b>	<b>16</b>		

SEMESTER 2/ 2<sup>ND</sup> SEMESTER

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