



UPM
UNIVERSITI PUTRA MALAYSIA
UNIVERSITY PUTRA MALAYSIA

**BAHAGIAN KEMASUKAN DAN
BAHAGIAN URUS TADBIR AKADEMIK**
PEJABAT TIBALAN NAIB CANSOLOR (AKADEMIK DAN ANTARABANGSA)
DIVISION OF ADMISSION AND DIVISION OF ACADEMIC GOVERNANCE
OFFICE OF DEPUTY VICE CHANCELLOR (ACADEMIC AND INTERNATIONAL)
بهاكيز. كمالوكن دان بهاكيز. اوروس تدبير اكلادميك
لجانته تيمبان نايب كانسولور (الكلادميك دان انتارابلسا)

BUKU PANDUAN PROGRAM

PENGAJIAN PRASISWAZAH
UNDERGRADUATE STUDY PROGRAMME HANDBOOK

FAKULTI SAINS PERTANIAN DAN PERHUTANAN
FACULTY OF AGRICULTURAL SCIENCE AND FORESTRY

SESI AKADEMIK
2023|2024
ACADEMIC SESSION

FAKULTI SAINS PERTANIAN DAN PERHUTANAN (BACELOR)

Maklumat Am

Sejarah UPMKB bermula dengan penubuhan sebuah kampus sementara di Semenggok, Kuching pada 10 Ogos 1974. Kampus ini telah berkembang dan berpindah ke kampus tetap yang lebih selesa di Bintulu, Sarawak pada bulan Jun 1987. Dengan kawasan kampus seluas 714 hektar, kampus ini telah mengorak langkah demi mencapai matlamat ketiga pelan strategik UPM 2001-2010 iaitu untuk meningkatkan keupayaan UPM sebagai pusat pengajian dan perkhidmatan pertanian serta biosumber terkemuka di peringkat antarabangsa. Menerusi proses penstrukturan semula UPMKB bermula tahun 2018, lima tujahan utama telah dikenalpasti iaitu pertanian, perhutanan, kimia industri, tenaga boleh diperbaharui dan ekonomi sosial. Pada 1 Julai 2020, dua fakulti telah ditubuhkan iaitu Fakulti Sains Pertanian dan Perhutanan (FSPH) dan Fakulti Kemanusiaan, Pengurusan dan Sains (FKPS).

Fakulti Sains Pertanian dan Perhutanan terdiri dari tiga jabatan akademik iaitu Jabatan Sains Tanaman, Jabatan Sains Perhutanan, dan Jabatan Sains Haiwan dan Perikanan. Program yang ditawarkan oleh FSPH mempunyai kebolehpasaran graduan yang tinggi kerana program pengajian yang relevan dan bertepatan dengan keperluan industri tempatan. Pelajar akan memperolehi pengalaman pembelajaran di dalam dan luar kelas yang komprehensif sambil dibantu oleh pensyarah yang kebanyakannya berkelulusan ijazah PhD. Kini, fakulti ini menawarkan 5 program Diploma, 3 program Bacelor, Master dengan tesis dan PhD. Umumnya, fakulti ini mampu menampung seramai 3000 orang pelajar menjelang tahun 2021.

FACULTY OF AGRICULTURAL SCIENCE AND FORESTRY

General Information

The history of UPMKB began with the establishment of a temporary campus at Semenggok, Kuching on August 10, 1974. The campus has expanded and moved to a more comfortable fixed campus in Bintulu, Sarawak in June 1987. With a 714-hectare campus area, this campus has begun steps towards achieving the third goal of UPM's 2001-2010 strategic plan to enhance UPM's capabilities as an internationally recognized center of studies, agricultural services and bioresources. Through the restructuring of UPMKB, which began in 2018, five main thrusts have been identified namely agriculture, forestry, industrial chemistry, renewable energy and social economy. On July 1, 2020, two faculties were established, namely the Faculty of Agriculture Science and Forestry and the Faculty of Humanities, Management and Science.

The Faculty of Agricultural Science and Forestry (FSPH) consists of three academic departments namely the Department of Crop Science, the Department of Forestry Science, and Department of Animal Science and Fisheries. The program offered by FSPH has high graduate employability due to its program relevance in accordance to the needs of the local industries. Students will gain comprehensive in-class and outdoor learning assisted by lecturers who are mostly with a PhD degree. Currently, the faculty offers 5 Diploma programs, 3 Bachelor programs, Master with thesis and PhD. Generally, this faculty is able to accommodate 3000 students by 2021.

Pengurusan Fakulti/ Faculty Management Committee

Dekan/ Dean

Dr. Zamri Rosli

Timbalan Dekan Akademik dan Hal Ehwal Pelajar

Deputy Dean

Prof. Madya Dr. Noorasmah Binti Saupi

Timbalan Dekan Penyelidikan dan Pendanaan

Deputy Dean

Prof. Madya Dr. Geoffery James Gerusu

Ketua Jabatan Sains Tanaman
Head, Department of Crop Science
Dr. Zakry Fitri Ab. Aziz

Ketua Jabatan Sains Perhutanan
Head, Department of Forestry Science
Dr. Norul Izani Md Allwi

Ketua Jabatan Sains Haiwan dan Perikanan
Head, Department of Animal Science and Fishery
Prof. Madya Dr. Jariah Binti Kamaludeen

Penolong Pendaftar
Assitant Registrar
En. Dexter Elvin Anak Menari

Program Prasiswazah yang Ditawarkan

Bachelor

1. Bachelor Sains Bioindustri dengan Kepujian [*Bachelor of Bioindustrial Science with Honours*]
2. Bachelor Sains Akuakultur dengan Kepujian [*Bachelor of Science in Aquaculture with Honours*]
3. Bachelor Sains Perhutanan dengan Kepujian (Perhutanan Ladang) [*Bachelor of Forestry Science with Honours (Forest Plantation)*]

MAKLUMAT DAN SKEMA PENGAJIAN PAKEJ ELEX UNTUK PROGRAM 4 TAHUN/ INFORMATION AND STUDY SCHEME ELEX PACKAGE FOR 4 YEAR PROGRAM

(Berkuatkuasa Untuk Ambilan Oktober 2022 Dan Seterusnya/ Effective For intake October 2022 onwards)

ELEX Requirements for Graduation

The required number of LPE courses, CEL courses and LAX points to be fulfilled is based on MUET Bands as shown in the table below:

CEFR Tahap	MUET Tahap		IELTS	TOEFL iBT	CIEP	Pearson Test of English (PTE) Academic	Cambridge English	Keperluan Bergraduat
Tahap	Band (format lama)	Band (format Baharu)	Skor	Skor	Tahap	Skor	Skor	
C1 – C2	5 - 6	5.0 – 5+	7.0 – 9.0	95 – 120	N/A	76 - 90	180 – 230	2 LPE + 1 CEL + 24 mata LAX <u>atau</u> 1 LPE + 1 CEL + 24 mata LAX + 1 Bahasa global
B1 – B2	3 - 4	3.0 – 4.5	4.0 – 6.5	42 – 94	104 – 109	43 – 75	140 – 179	2 LPE + 2 CEL + 24 mata LAX
1 - A2	1 - 2	1.0 - 2.5	2.5 – 3.5	N/A	101 - 103	24 - 42	100 - 139	3 LPE + 3 CEL + 24 mata LAX

Sem	SKEMA UNTUK PROGRAM 4 TAHUN		
	MUET 1.0 – 2.5 IELTS 2.5 – 3.5 CIEP 101 – 103 PTE 24 – 42 CE 100 – 139	MUET 3.0 – 4.5 TOEFL iBT 42 – 94 IELTS 4.0 – 6.5 CIEP 104 – 109 PTE 43 – 75 CE 140 – 179	MUET 5.0 – 5+ TOEFL iBT 95 – 120 IELTS 7.0 – 9.0 PTE 76 – 90 CE 180 – 230
Sem 1	LAX 12 mata	LAX 6 mata	LAX 6 mata
Sem 2	6 LAX points CEL2102	LPE2403	Pilih satu: CEL2103/2104
Sem 3	LPE2302	LPE2503	Pilih satu: LPE2303 / LPE5402 / Bahasa Global
Sem 4	LPE2403	LAX 6 mata	LAX 6 mata
Sem 5	LPE2503	Pilih satu: CEL2105/2106/2107	Pilih satu: LPE2504 / LPE2303 / Bahasa Global
Sem 6	Pilih satu: CEL 2105/ 2106/2107	Pilih satu: CEL 2105/ 2106/2107	LAX 6 mata
Sem 7	Pilih satu: CEL 2105/ 2106/2107	LAX 6 mata	LAX 6 mata
Sem 8	6 LAX points	LAX 6 mata	-

Note:

Students must follow the scheme of study provided based on MUET (or equivalent) every semester.

- Students MUET Band 5 and 6 have the option of taking either one or two LPE courses. Students who choose one LPE course, must also take a course in global language.
- Students who are on Industrial Training in a specific semester, do not need to register for English Language course or English Language skills activities for that semester but have to register and attend the course or activity in the preceding or prospective semester (subject to pre-requisite courses).

Information for ELEX (English Language Experience) package

I. LPE courses [credit (2+1)]

- LPE2302 (*Reading for Academic Purposes*)
- LPE2403 (*Academic Interaction and Presentation*)
- LPE2503 (*Academic Writing*)
- LPE2303 - **ONLY** for MUET Band 5 & 6
- LPE2504 - **ONLY** for MUET Band 5 & 6

Note: Students who failed the BBI course, must repeat the course until they pass before taking the next course.

II. CEL courses

- CEL2102 (*Effective Listening and Speaking*)
- CEL2103 (*Writing Academic Texts*)
- CEL2105 (*Spoken Communication for the Workplace*)
- CEL2106 (*Communication for Professional Development*)
- CEL2107 (*Written Business Communication*)

Note: Students who obtained Level 1 for CEL course, must repeat the course until pass (Level 2 and above).

III. LAX

- LAX (6 points or 12 points); 1 point = 2 hours per week
- 6 points LAX = 6 weeks x 2 hours per week
- 12 points LAX = 12 weeks x 2 hours per week
- LAX activities offered each semester will be announced by CALC (Centre for the Advancement of Language Competence)

Note: Students who obtained TM (Not Satisfactory), must take the same or different LAX activities to replace the failed activity points (TM). Students must ensure that the required number of LAX points is fulfilled before graduation.

Note:

Students must follow the prescribed scheme of study based on their MUET results (or equivalent) every semester.

- MUET Band 5 and 6 students can choose to enrol in either one or two BBI courses. If they choose to do one BBI course, they must also enrol in one global language.
- Students who are away on Industrial Training in any semester do have not to enrol in any course or LAX activity for that particular semester. However, they must enrol in a course or LAX activity in the prior or subsequent semester (subject to course pre-requisites).

ELEX Package Information

I. BBI Courses [(2+1) credits]

- LPE2302 (Reading for Academic Purposes)
- LPE2403 (Academic Interaction and Presentation)
- LPE2503 (Academic Writing)
 - BBI2425 – for MUET Band 5 & 6 students only
 - BBI2426 – for MUET Band 5 & 6 students only

Note: If students fail in a BBI course, they must repeat and pass the course before they can enrol in a subsequent BBI course.

II. CEL Courses

- CEL2102 (Effective Listening and Speaking)
- CEL2103 (Writing Academic Texts)
- CEL2105 (Spoken Communication for the Workplace)
- CEL2106 (Communication for Professional Development)
- CEL2107 (Written Business Communication)

Note: If students obtain LEVEL 1, they must repeat and pass the course (LEVEL 2 and above).

III. LAX

- LAX (6 points or 12 points); 1 point = 2 hours per week
- 6-point LAX = 6 weeks x 2 hours per week
- 12-point LAX = 12 weeks x 2 hours per week

Note: If students obtain TM (*Tidak Memuaskan/Unsatisfactory*), they must enrol in the same or different LAX activity to replace the failed points. Students must ensure that they fulfil the required number of LAX points for graduation.

IV. Pre-requisites for courses

- LPE2302: MUET Band 1 – 2/equivalent
- LPE2403: CEL 2102 Level 2 or MUET Band 3 – 4/equivalent
- LPE2503: Passed LPE2403
- CEL2103: Passed LPE2503 or MUET Band 5 – 6/equivalent
- CEL2102, 2105, 2106, 2107: No pre-requisite required

**Bachelor Sains Bioindustri dengan
Kepujian**

***Bachelor of Bioindustrial Science
with Honours***

STRUKTUR KURIKULUM / CURRICULUM STRUCTURE

Nama Program : **Bachelor Sains Bioindustri dengan Kepujian / Bachelor of Bioindustrial Science with Honours**

Jumlah Kredit Bergraduat : **128 Jam Kredit / Credit Hours**

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

Matlamat Program :

1. berpengetahuan dan berkemahiran dalam memenuhi pasaran guna tenaga bioindustri yang berasaskan sumber tanaman negara,
2. berfikiran kritis dalam mengaplikasikan pengetahuan sains bioindustri untuk tujuan penyelidikan dan pengajian lanjutan, dan
3. berinovatif, beretika dan berintegriti dalam mengaplikasi ilmu dan kemahiran untuk meningkatkan pengeluaran tanaman, produk agromakanan dan pengurusan sisa bioindustri.

RINGKASAN HASIL PEMBELAJARAN PROGRAM

Program	Pengetahuan	Kemahiran Teknikal	Kemahiran Kognitif	Kemahiran Berkomunikasi	Kemahiran Interpersonal	Etika dan Professionalisme	Mehahiran Digital	Kemahiran Personal dan Keusahawanan	Kepimpinan, Autonomi dan Tanggungjawab	Kemahiran Numerasi
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
Bachelor Sains Bioindustri dengan Kepujian	41	30	20	17	10	16	14	7	4	6

1. Kursus Universiti / University Courses (21 Kredit / 21 Credits)

KOD KURSUS / COURSE CODE	NAMA KURSUS / COURSE NAME	Kr	K	A	PRASYARAT / PREREQUISITE	(√) Jika lulus/ if passed
LPE2403	Academic Interaction and Presentation	3	2	1	Tiada / None	
LPE2503	Academic Writing	3	2	1	Tiada / None	
KOM3403	Pengucapan Awam / Public Oration	3	3	0	Tiada / None	
MGM3180	Asas Keusahawanan / Basic Entrepreneurship	3	2	1	Tiada / None	
PRT2008	Pertanian dan Manusia/Agriculture and Man	2	2	0	Tiada / None	
SKP2101*	Kenegaraan Malaysia/ Malaysian Nationhood	3	3	0	Tiada / None	
FEM2401**	Politik Malaysia dan Masyarakat/ Malaysian Politics and Society	2	2	0		
SKP3112*	Falsafah dan Isu Semasa/ Philosophy and Current Issues	2	2	0	Tiada/ None	

SKP3113**	Falsafah dan Isu Semasa Masyarakat Sivil/ <i>Philosophy and Current Issues in Civil Society</i>					
atau/ or SKP3123**	atau/ or 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	

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

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

KOD KURSUS / COURSE CODE	NAMA KURSUS / COURSE NAME	Kr	K	A	PRASYARAT / PREREQUISITE	(√) Jika lulus/ if passed
AFS2001	Program Buku Hijau / <i>Green Book Programme</i>	2	0	2	Tiada / None	
CAG3005	Unsur Bioindustri / <i>Elements of BioIndustry</i>	2	2	0	Tiada / None	
CAG3006	Pengeluaran Tanaman Makanan / <i>Food Crops Production</i>	3	2	1	Tiada / None	
CAG3007	Pengeluaran Tanaman Industri / <i>Industrial Crops Production</i>	3	2	1	Tiada / None	
CAG3008	Fisiologi Tumbuhan / <i>Plant Physiology</i>	3	2	1	Tiada / None	
CAG3009	Asas Sains Tanaman / <i>Basic Crop Science</i>	2	1	1	Tiada / None	
CAT4103	Mikrobiologi Gunaan / <i>Applied Microbiology</i>	3	2	1	Tiada / None	
CES3201	Pengembangan dan Jaringan Industri / <i>Extension and Industrial Networking</i>	3	1	2	Tiada / None	
CFP4959	Disertasi Bachelo / <i>Bachelor Dissertation</i>	6	0	6	Tiada / None	
CIT4902	Latihan Industri / <i>Industrial Training</i>	10	0	10	Tiada / None	
CPP3600	Perlindungan Tumbuhan / <i>Plant Protection</i>	3	2	1	Tiada / None	
CPT3801	Bioteknologi dalam Bioindustri / <i>Biotechnology in Bioindustry</i>	3	2	1	Tiada / None	
CPT3802	Pemprosesan Bioproduk / <i>Bioproducts Processes</i>	3	2	1	Tiada / None	
CPT3803	Prinsip Biobahan dalam Bioindustri / <i>Principal of Biomaterials in Bioindustry</i>	2	2	0	Tiada / None	
CSS3700	Sains Tanah / <i>Soil Science</i>	3	2	1	Tiada / None	
CSS3703	Klimatologi / <i>Climatology</i>	2	2	0	Tiada / None	
CSS3704	Prinsip Ekologi Pencemaran / <i>Principles of Pollution Ecology</i>	2	2	0	Tiada / None	
SEC3102	Ekonomi Bioindustri / <i>Bioindustrial Economics</i>	2	2	0	Tiada / None	
SFB3100	Biologi Sel dan Genetik / <i>Cell Biology and Genetic</i>	3	2	1	Tiada / None	
SFC3001	Kimia Fizik dan Tak Organik / <i>Physical and Inorganic Chemistry</i>	3	2	1	Tiada / None	

SFC3201	Biokimia / <i>Biochemistry</i>	3	2	1	Tiada / <i>None</i>	
SFM3201	Biostatistik / <i>Biostatistic</i>	3	3	0	Tiada / <i>None</i>	

3. Kursus Elektif / *Elective Course* (36 Jam Kredit / *Credit Hours*)

KOD KURSUS / <i>COURSE CODE</i>	NAMA KURSUS / <i>COURSE NAME</i>	Kr	K	A	PRASYARAT / <i>PREREQUISITE</i>	(√) Jika lulus/ if passed
CAG3012	Fisiologi Lepastuai / <i>Post-harvest Physiology</i>	3	2	1	Tiada / <i>None</i>	
CAG4001	Pembiakbakaan Tumbuhan / <i>Plant Breeding</i>	3	2	1	Tiada / <i>None</i>	
CAG4003	Ekonomi Botani / <i>Economic Botany</i>	3	2	1	Tiada / <i>None</i>	
CAG4004	Adaptasi Tanaman dan Perubahan Iklim Global / <i>Crop Adaptation and Global Climate Change</i>	3	2	1	Tiada / <i>None</i>	
CAT3106	Sisa Agrofiber dan Utilisasi / <i>Waste and Agrofiber Utilization</i>	3	2	1	Tiada / <i>None</i>	
CAT4100	Pertanian Presisi / <i>Precision Agriculture</i>	3	2	1	Tiada / <i>None</i>	
CAT4102	Kultur Tisu Tumbuhan / <i>Plant Tissue Culture</i>	3	2	1	Tiada / <i>None</i>	
CAT4105	Teknologi Fermentasi / <i>Fermentation Technology</i>	3	2	1	Tiada / <i>None</i>	
CAT4110	Pengurusan Sisa Bioindustri / <i>Bioindustry Waste Management</i>	3	2	1	Tiada / <i>None</i>	
CAT4109	Teknologi Biobaja dan Biostimulan / <i>Biofertilizer and Biostimulant Technology</i>	3	2	1	Tiada / <i>None</i>	
CFM3401	Pengurusan Ladang / <i>Farm Management</i>	3	3	0	Tiada / <i>None</i>	
CPP4600	Sains Racun Perosak / <i>Pesticide Science</i>	3	2	1	Tiada / <i>None</i>	
CPT4800	Kimia Dan Pemprosesan Hasil Komoditi Tumbuhan / <i>Chemistry and Processing of Plant Based Commodities</i>	3	2	1	Tiada / <i>None</i>	
CPT4803	Pemprosesan Produk Semulajadi / <i>Natural Product Processing</i>	3	2	1	Tiada / <i>None</i>	
CPT4805	Teknologi Pemprosesan Hiliran / <i>Downstream Processing Technology</i>	3	2	1	Tiada / <i>None</i>	
CSS3701	Pengurusan Kesuburan Tanah dan Tanaman / <i>Crop and Soil Fertility Management</i>	3	2	1	Tiada / <i>None</i>	
CSS4702	Sifat dan Toksikologi Bahan Cemar / <i>Properties and Toxicology of Pollutants</i>	3	2	1	Tiada / <i>None</i>	
SAB4401	Pemasaran Produk AgroBio / <i>Marketing of Agrobio Product</i>	3	3	0	Tiada / <i>None</i>	
BBXyyyy	Bahasa Global	3	2	1	Tiada / <i>None</i>	

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

SKEMA PENGAJIAN/ STUDY SCHEME

TAHUN 1 / 1ST YEAR

SEMESTER 1 / 1ST SEMESTER

KOD KURSUS / COURSE CODE	NAMA KURSUS / COURSE NAME	Kr	K	A
LPE2403	Academic Interaction and Presentation	3	2	1
SKP3112*	Falsafah dan Isu Semasa/ <i>Philosophy and Current Issues</i>	2	2	0
SKP3113**	Falsafah dan Isu Semasa Masyarakat Sipil/ <i>Philosophy and Current Issues in Civil Society</i>	3	3	0
atau/ or SKP3123**	Penghayatan Etika dan Peradaban di Malaysia/ <i>Internalization of Ethics and Civilization in Malaysia</i>			
CAG3009	Asas Sains Tanaman / <i>Basic Crop Science</i>	2	1	1
KOM3403	Pengucapan Awam / <i>Public Oration</i>	3	3	0
CAG3005	Unsur Bioindustri / <i>Elements of BioIndustry</i>	2	2	0
SFB3100	Biologi Sel dan Genetik / <i>Cell Biology and Genetic</i>	3	2	1
QKSxxxx	Kokurikulum	1	0	1
JUMLAH/ TOTAL		16	12	4

SEMESTER 2 / 2ND SEMESTER

KOD KURSUS / COURSE CODE	NAMA KURSUS / COURSE NAME	Kr	K	A
LPE2503	Academic Writing	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
AFS2001	Program Buku Hijau / <i>Green Book Programme</i>	2	0	2
SFC3001	Kimia Kimia Fizik dan Tak Organik / <i>Physical and Inorganic Chemistry</i>	3	2	1
CAG3006	Pengeluaran Tanaman Makanan / <i>Food Crops Production</i>	3	2	1
PRT2008	Pertanian dan Manusia/ <i>Agriculture and Man</i>	2	2	0
QKSxxxx	Kokurikulum	1	0	1
JUMLAH/ TOTAL		17	11	6

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

KOD KURSUS / COURSE CODE	NAMA KURSUS / COURSE NAME	Kr	K	A
CAG3008	Fisiologi Tumbuhan / <i>Plant Physiology</i>	3	2	1
CSS3700	Sains Tanah / <i>Soil Science</i>	3	2	1
CAT4103	Mikrobiologi Gunaan / <i>Applied Microbiology</i>	3	2	1
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
CPP3600	Perlindungan Tumbuhan / <i>Plant Protection</i>	3	2	1
CAG3007	Pengeluaran Tanaman Industri / <i>Industrial Crops Production</i>	3	2	1
JUMLAH / TOTAL		17	12	5

SEMESTER 2 / 2ND SEMESTER

KOD KURSUS / COURSE CODE	NAMA KURSUS / COURSE NAME	Kr	K	A
SEC3102	Ekonomi Bioindustri / <i>Bioindustrial Economics</i>	2	2	0
MGM3180	Asas Keusahawanan / <i>Basic Entrepreneurship</i>	3	2	1
SFC3201	Biokimia / <i>Biochemistry</i>	3	2	1
CPT3802	Pemprosesan Bioproduk / <i>Bioproducts Processes</i>	3	2	1
CPT3801	Bioteknologi dalam Bioindustri / <i>Biotechnology in Bioindustry</i>	3	2	1
CPT3803	Prinsip Biobahan dalam Bioindustri / <i>Principal of Biomaterials in Bioindustry</i>	2	2	0
CSS3704	Prinsip Ekologi Pencemaran / <i>Principles of Pollution Ecology</i>	2	2	0
JUMLAH / TOTAL		18	14	4

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

KOD KURSUS / COURSE CODE	NAMA KURSUS / COURSE NAME	Kr	K	A
CES3201	Pengembangan dan Jaringan Industri / <i>Extension and Industrial Networking</i>	3	1	2
CSS3703	Klimatologi / <i>Climatology</i>	2	2	0
Elektif / <i>Elective</i>		12	8	4
JUMLAH / TOTAL		17	11	6

SEMESTER 2 / 2ND SEMESTER

KOD KURSUS / COURSE CODE	NAMA KURSUS / COURSE NAME	Kr	K	A
SFM3201	Biostatistik / <i>Biostatistic</i>	3	3	0
CFP4959A	Disertasi Bacelor / <i>Bachelor Disertation</i>	3	0	3
	Elektif / <i>Elective</i>	12	10	2
JUMLAH /TOTAL		18	13	5

TAHUN 4 / 4TH YEARSEMESTER 1 / 1ST SEMESTER

KOD KURSUS / COURSE CODE	NAMA KURSUS / COURSE NAME	Kr	K	A
CFP4959B	Disertasi Bacelor / <i>Bachelor Disertation</i>	3	0	3
	Elektif / <i>Elective</i>	12	8	4
JUMLAH /TOTAL		15	8	7

SEMESTER 2 / 2ND SEMESTER

KOD KURSUS / COURSE CODE	NAMA KURSUS / COURSE NAME	Kr	K	A
CIT4902	Latihan Industri / <i>Industrial Training</i>	10	0	10
JUMLAH /TOTAL		10	0	10

Nota/Notes :

1. Pelajar diwajibkan memilih 2 kredit daripada kursus kokurikulum yang ditawarkan oleh universiti. / *Students are required to select 2 credits from the cocurriculum courses offered by the university.*
2. Pelajar perlu melengkapkan pakej keperluan bahasa inggeris seperti jadual di bawah: Butiran lanjut mengenai CEL dan LAX sila rujuk di muka surat 3 buku panduan ini. / *Students need to complete the english package as the table below : For more details on CEL and LAX please refer to page 3 of this book.*

**Bachelor Sains Akuakultur dengan
Kepujian**

***Bachelor of Science in
Aquaculture with Honours***

STRUKTUR KURIKULUM / CURRICULUM STRUCTURE

Nama Program : **Bachelor Sains Akuakultur dengan Kepujian / Bachelor of Science in Aquaculture with Honours**

Jumlah Kredit Bergraduat : **128 Jam Kredit* / Credit Hours***

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

Matlamat Program :

1. Melahirkan pegawai perikanan dalam bidang akukultur yang berpengetahuan dalam aspek teori dan praktikal serta berdaya saing.
2. Melahirkan pegawai perikanan yang boleh mengaplikasi ilmu pengetahuan dalam mengurus dan melaksanakan penyelidikan secara teknikal dan beretika.
3. Melahirkan pegawai perikanan yang berkebolehan mengurus industri akuakultur secara berdikari atau berkhidmat dengan agensi berkaitan.

RINGKASAN HASIL PEMBELAJARAN PROGRAM

Program	Pengetahuan	Kemahiran Teknikal/ Praktikal/ Psikomotor	Pendekatan Kemahiran Berfikir dan Sainifik	Kemahiran Berkomunikasi	Kemahiran Sosial dan Bertanggungjawab	Professionalisme, Nilai, Sikap dan Etika	Pendidikan Sepanjang Hayat dan Pengurusan Informasi	Kemahiran Pengurusan dan Keusahawanan	Kemahiran Kepimpinan
	P1	P2	P3	P4	P5	P6	P7	P8	P9
Bachelor Sains Akuakultur dengan Kepujian	38	12	15	11	8	14	15	10	2

1. Kursus Universiti / University Courses (23 Kredit / Credits)

KOD KURSUS / COURSE CODE	NAMA KURSUS / COURSE NAME	Kr	K	A	PRASYARAT / PREREQUISITE	(√) Jika lulus/ if passed
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>					
atau/ or SKP3123**	atau/ or 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	

PPT3701	Keusahawanan Pertanian / <i>Agricultural Entrepreneurship</i>	3	1	2	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		
TKP3206	Pengembangan Akuakultur / <i>Aquaculture Extension</i>	2	1	1	Tiada / None	
LPE2403	Interaksi Akademik dan Pembentangan / <i>Academic Interaction and Presentation</i>	3	2	1	LPE2302 atau CEL2102 Tahap 2	
LPE2503	Penulisan Akademik / <i>Academic Writing</i>	3	2	1	LPE2403	
PRT2008*	Pertanian dan Manusia / <i>Agriculture and Man</i>	2	2	0	Tiada / None	
AFS2002***	Program Buku Hijau / <i>Green Book Programme</i>	1	0	1	Tiada / None	
QKS2112****	Renang Asas / <i>Basic Swimming</i>	1	0	1	Tiada / None	
QKXxxxx	Kokurikulum / <i>Cocurriculum</i>	1	0	1		

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

***Khusus untuk program pengajian prasiswazah yang ditawarkan di Universiti Putra Malaysia Kampus Bintulu Sarawak (UPMKB). / Specifically for undergraduate study programs offered at Universiti Putra Malaysia Bintulu Sarawak Campus (UPMKB)

****Pelajar diwajibkan mengambil satu kredit kursus Renang Asas (QKS2112) bagi memastikan pelajar mempunyai kemahiran renang dan keselamatan air sebagai nilai tambah / Students are required to take one credit course Basic Swimming (QKS2112) to ensure that students have basic swimming skills and water safety as a value-added

2. Kursus Teras / Core Courses (73 Kredit / Credits)

KOD KURSUS / COURSE CODE	NAMA KURSUS / COURSE NAME	Kr	K	A	PRASYARAT / PREREQUISITE	(√) Jika lulus/ if passed
AKU3103	Iktiologi / <i>Ichthyology</i>	3	2	1	Tiada / None	
AKU3105	Biologi Invertebrat Akuatik / <i>Aquatic Invertebrate Biology</i>	3	2	1	Tiada / None	
AKU3106	Botani Akuatik / <i>Aquatic Botany</i>	3	2	1	Tiada / None	
AKU3201	Prinsip Akuakultur / <i>Principles of Aquaculture</i>	3	2	1	Tiada / None	
AKU3301	Genetik dan Pembiakbakaan Ikan / <i>Fish Genetics and Breeding</i>	3	2	1	Tiada / None	
AKU3302	Teknologi Pembenihan Ikan dan Pengurusan Fri / <i>Fish Seed Technology and Fry Management</i>	3	2	1	Tiada / None	
AKU3401	Pemakanan Akuakultur / <i>Aquaculture Nutrition</i>	3	2	1	Tiada / None	
AKU3501	Pengurusan Kesihatan Ikan / <i>Fish Health Management</i>	3	2	1	Tiada / None	
AKU3601	Kualiti Air dan Tanah dalam Akuakultur / <i>Water and Soil Quality in Aquaculture</i>	3	2	1	Tiada / None	

AKU4901	Latihan Industri / <i>Industrial Training</i>	12	0	12	Tiada / None	
PPT3301	Prinsip Pengurusan dan Pemasaran Pertanian / <i>Principles of Agricultural Management and Marketing</i>	3	3	0	Tiada / None	
AKU3602	Ekologi Akuatik / <i>Aquatic Ecology</i>	3	2	1	Tiada / None	
AKU4959	Disertasi Bachelo / <i>Bachelor Dissertation</i>	6	0	6	Tiada / None	
AKU4402	Pengeluaran Makanan Hidup dalam Akuakultur / <i>Live Food Production in Aquaculture</i>	3	2	1	Tiada / None	
AKU3108	Statistik Dan Penyelidikan Dalam Akuakultur / <i>Statistics and Research in Aquaculture</i>	4	3	1	Tiada / None	
AKU3210	Kultur Ikan / <i>Finfish Culture</i>	3	1	2	Tiada / None	
AKU3109	Fisiologi Ikan dan Biokimia / <i>Fish Physiology and Biochemistry</i>	4	3	1	Tiada / None	
EPT3102	Ekonomi Pertanian / <i>Agricultural Economics</i>	3	2	1	Tiada / None	
AKU3801	Pasca Tuai Dalam Akuakultur / <i>Postharvest In Aquaculture</i>	2	1	1	Tiada / None	
AKU3802	Inovasi dalam Akuakultur / <i>Innovation in Aquaculture</i>	3	1	2	Tiada / None	

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

Kursus elektif (32 kredit) terdiri daripada 26 kredit kursus yang disenaraikan dalam kursus elektif program dan enam (6) kredit kursus bebas UPM atau mana-mana universiti dalam dan luar negara untuk melengkapkan keperluan dengan persetujuan Jabatan.

The elective courses (32 credits) consisted of 26 credits listed as program elective courses and six (6) open elective courses from UPM or other local or foreign universities to complement the requirement with the permission of the department.

KOD KURSUS / COURSE CODE	NAMA KURSUS / COURSE NAME	Kr	K	A	PRASYARAT / PREREQUISITE	(√) Jika lulus/ if passed
AKU4701	Teknologi Maklumat dan Komunikasi dalam Akuakultur / <i>Information and Communications Technology in Aquaculture</i>	3	1	2	Tiada / None	
AKU4203	Sistem Pengeluaran Akuakultur / <i>Aquaculture Production Systems</i>	3	2	1	Tiada / None	
AKU4102	Limnologi / <i>Limnology</i>	3	2	1	Tiada / None	
AKU4202	Kultur Ikan dan Tumbuhan Akuatik Hiasan / <i>Culture of Ornamental Fish and Aquatic Plants</i>	3	2	1	Tiada / None	
AKU4221	Kultur Krustasea / <i>Crustacean Culture</i>	3	2	1	Tiada / None	
AKU4231	Kultur Molusk / <i>Mollusc Culture</i>	3	2	1	Tiada / None	
AKU4301	Endokrinologi Ikan / <i>Fish Endocrinology</i>	3	2	1	Tiada / None	
AKU4801	Perikanan Rekreasi dalam Ekopelancongan Perairan Darat /	3	2	1	Tiada / None	

<i>Recreational Fisheries in Inland Waters Ecotourism</i>					
AKU4501	Mikrobiologi Akuatik / <i>Aquatic Microbiology</i>	3	2	1	Tiada / None
AKU4502	Imunologi Ikan / <i>Fish Immunology</i>	3	2	1	Tiada / None
AKU4601	Ekologi dan Pengurusan Tanah Basah/ <i>Ecology and Management of Wetlands</i>	3	2	1	Tiada / None
AKU4101	Penilaian Dan Pengurusan Sumber Perikanan / <i>Fisheries Resource Assessment and Management</i>	3	2	1	Tiada / None
AKU4802	Biologi Molekul Dalam Akuakultur / <i>Molecular Biology in Aquaculture</i>	3	2	1	Tiada / None
AKU4401	Teknologi Makanan Akuakultur / <i>Aquafeed Technology</i>	3	1	2	Tiada / None
AKU4243	Kultur Alga / <i>Algae Culture</i>	3	2	1	Tiada / None
AKU4804	Polisi dan Akta Untuk Perikanan dan Akuakultur/ <i>Policy and Acts for Fisheries and Aquaculture</i>	2	2	0	Tiada / None
AKU4204	Kultur Spesies Unik/ <i>Unique Species Culture</i>	2	2	0	Tiada / None
AKU4103	Oseanografi/ <i>Oceanography</i>	3	2	1	Tiada / None

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

Nota Penting / Notes :

Pelajar diwajibkan memilih 2 kredit daripada kursus ko-kurikulum yang ditawarkan oleh universiti. / *Students are required to select 2 credits from the co-curriculum courses offered by the university.*

SKEMA PENGAJIAN/ STUDY SCHEME

TAHUN 1 / 1ST YEAR

SEMESTER 1 / 1ST SEMESTER

KOD KURSUS / COURSE CODE	NAMA KURSUS / COURSE NAME	Kr	K	A
AKU3103	Iktiologi / <i>Ichthyology</i>	3	2	1
AKU3105	Biologi Invertebrat Akuatik / <i>Agriculture Production System</i>	3	2	1
AKU3602	Ekologi Akuatik / <i>Aquatic Ecology</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
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>			
atau/ or SKP3123**	atau/ or Penghayatan Etika dan Peradaban di Malaysia/ <i>Internalization of Ethics and Civilization in Malaysia</i>	3	3	0
QKS2112	Renang Asas / <i>Basic Swimming</i>	1	0	1
ELEx	English Learning Experience (LAX)	0	0	0
JUMLAH / TOTAL		15	11	4

SEMESTER 2 / 2ND SEMESTER

KOD KURSUS / COURSE CODE	NAMA KURSUS / COURSE NAME	Kr	K	A
PRT2008	Pertanian dan Manusia/ <i>Agriculture and Man</i>	2	2	0
AFS2002	Program Buku Hijau / <i>Green Book Programme</i>	1	0	1
AKU3106	Botani Akuatik / <i>Aquatic Botany</i>	3	2	1
AKU3109	Fisiologi Ikan dan Biokimia / <i>Fish Physiology and Biochemistry</i>	4	3	1
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
QKXxxxx	Kokurikulum / <i>Cocurriculum</i>	1	0	1
PPT3301	Prinsip Pengurusan dan Pemasaran Pertanian / <i>Principles of Agricultural Management and Marketing</i>	3	3	0
ELEx	English Learning Experience (LPE/LAX/CEL)	0	0	0
JUMLAH / TOTAL		16	12	4

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

KOD KURSUS / COURSE CODE	NAMA KURSUS / COURSE NAME	Kr	K	A
PPT3701	Keusahawanan Pertanian / <i>Agricultural Entrepreneurship</i>	3	1	2
AKU3201	Prinsip Akuakultur / <i>Principles of Aquaculture</i>	3	2	1
AKU4402	Pengeluaran Makanan Hidup dalam Akuakultur / <i>Live Food Production in Aquaculture</i>	3	2	1
AKU3601	Kualiti Air dan Tanah dalam Akuakultur / <i>Water and Soil Quality in Aquaculture</i>	3	2	1
AKU3501	Pengurusan Kesihatan Ikan / <i>Fish Health Management</i>	3	2	1
EPT3102	Ekonomi Pertanian / <i>Agricultural Economics</i>	3	2	1
ELEx	English Learning Experience (LPE/Bahasa Global)	0	0	0
JUMLAH / TOTAL		18	11	7

SEMESTER 2 / 2ND SEMESTER

KOD KURSUS / COURSE CODE	NAMA KURSUS / COURSE NAME	Kr	K	A
TKP3206	Pengembangan Akuakultur / <i>Aquaculture Extension</i>	2	1	1
AKU3301	Genetik dan Pembiakbakaan Ikan / <i>Fish Genetics and Breeding</i>	3	2	1
AKU3302	Teknologi Pembenihan Ikan dan Pengurusan Fri / <i>Fish Seed Technology and Fry Management</i>	3	2	1
AKU3401	Pemakanan Akuakultur / <i>Aquaculture Nutrition</i>	3	2	1
AKU3210	Kultur Ikan / <i>Finfish Culture</i>	3	1	2
ELEx	English Learning Experience (LPE/Bahasa Global)	0	0	0
	Elektif / <i>Electives</i>	3	2	1
JUMLAH / TOTAL		17	10	7

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

KOD KURSUS / COURSE CODE	NAMA KURSUS / COURSE NAME	Kr	K	A
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AKU3802	Inovasi Dalam Akuakultur / <i>Innovation in Aquaculture</i>	3	1	2
AKU3108	Statistik Dan Penyelidikan Dalam Akuakultur / <i>Statistics and Research in Aquaculture</i>	4	3	1
AKU3801	Pasca Tuai Dalam Akuakultur / <i>Postharvest In Aquaculture</i>	2	1	1
ELEx	English Learning Experience (LPE/LAX/CEL)	0	0	0
	Elektif / <i>Electives</i>	3	2	1
	Elektif / <i>Electives</i>	3	2	1
	JUMLAH / TOTAL	15	9	6

SEMESTER 2 / 2ND SEMESTER

KOD KURSUS / COURSE CODE	NAMA KURSUS / COURSE NAME	Kr	K	A
AKU4959A	Disertasi Bachelo / <i>Bachelor Dissertation</i>	3	0	3
ELEx	English Learning Experience (LPE/LAX/CEL)	0	0	0
	Elektif / <i>Electives</i>	14	8	6
	JUMLAH / TOTAL	17	8	9

TAHUN 4 / 4TH YEAR

SEMESTER 1 / 1ST SEMESTER

KOD KURSUS / COURSE CODE	NAMA KURSUS / COURSE NAME	Kr	K	A
AKU4959B	Disertasi Bachelo / <i>Bachelor Dissertation</i>	3	0	3
ELEx	English Learning Experience (LAX/CEL)	0	0	0
	Elektif / <i>Electives</i>	9	6	3
	JUMLAH / TOTAL	12	6	6

SEMESTER 2 / 2ND SEMESTER

KOD KURSUS / COURSE CODE	NAMA KURSUS / COURSE NAME	Kr	K	A
AKU4901	Latihan Industri / <i>Industrial Training</i>	12	0	12
	JUMLAH / TOTAL	12	0	12

Nota/Notes :

1. Pelajar diwajibkan memilih 2 kredit daripada kursus kokurikulum yang ditawarkan oleh universiti. / *Students are required to select 2 credits from the cocurriculum courses offered by the university.*
2. Pelajar perlu melengkapkan pakej keperluan Bahasa Inggeris seperti jadual di bawah: Butiran lanjut mengenai CEL dan LAX sila rujuk di muka surat 3 buku panduan ini. / *Students need to complete the english package as the table below : For more details on CEL and LAX please refer to page 3 of this book.*

**Bachelor Sains Perhutanan dengan
Kepujian (Perhutanan Ladang)**

***Bachelor of Forestry Science with
Honours (Forest Plantation)***

STRUKTUR KURIKULUM / CURRICULUM STRUCTURE

Nama Program : **Bachelor Sains Perhutanan dengan Kepujian (Perhutanan Ladang) / Bachelor of Forestry Science with Honours (Forest Plantation)**

Jumlah Kredit Bergraduat : **130 Jam Kredit* / Credit Hours***

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

Matlamat Program :

1. Melahirkan graduan yang berpengetahuan tentang sains perhutanan dan bidang berkaitan perhutanan bagi menjamin kehidupan manusia yang lebih baik seimbang dengan pembangunan fizikal.
2. Melahirkan graduan yang berkebolehan, profesional dan berkeupayaan dalam penyelidikan, merancang, mengurus, melaksana dan mengaplikasikan teknologi terkini berkaitan sektor perhutanan.
3. Melahirkan graduan yang beretika dan bertanggungjawab ke atas masyarakat, budaya, sumber hutan dan alam semula jadi.

RINGKASAN HASIL PEMBELAJARAN PROGRAM

Program	Pengetahuan	Kemahiran Teknikal/ Praktikal/ Psikomotor	Pendekatan Kemahiran Berfikir dan Saintifik	Kemahiran Berkomunikasi	Kemahiran Sosial dan Bertanggungjawab	Professionalisme, Nilai, Sikap dan Etika	Pendidikan Sepanjang Hayat dan Pengurusan Informasi	Kemahiran Pengurusan dan Keusahawanan	Kemahiran Kepimpinan
	P1	P2	P3	P4	P5	P6	P7	P8	P9
Bachelor Sains Perhutanan dengan Kepujian (Perladangan Hutan)	41	31	30	10	10	19	14	8	9

1. Kursus Universiti / University Courses (26 Kredit / Credits)

KOD KURSUS / COURSE CODE	NAMA KURSUS / COURSE NAME	Kr	K	A	PRASYARAT / PREREQUISITE	(√) Jika lulus/ if passed
LPE2403	Interaksi Akademik dan Pembentangan / <i>Academic Interaction and Presentation</i>	3	2	1	CEL2102	
LPE2503	Penulisan Akademik / <i>Academic Writing</i>	3	2	1	LPE2403	
FCE3204	Kemahiran Berfikir / <i>Thinking Skills</i>	2	2	0	Tiada / None	
MGM3180	Asas Keusahawanan / <i>Basic Entrepreneurship</i>	3	2	1	Tiada / None	
KOM3403	Pengucapan Awam / <i>Public Oration</i>	3	3	0	Tiada / None	
PRT2008*	Pertanian dan Manusia / <i>Agriculture and Man</i>	2	2	0	Tiada / None	
AFS2002***	Program Buku Hijau / <i>Green Book Programme</i>	1	0	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		
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>					
atau/ or	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	
QKK2101	Bakti Siswa	1	0	1		
QKXxxxx	Kokurikulum / Co-curriculum	1	0	1		

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

***Khusus untuk program pengajian prasiswazah yang ditawarkan di Universiti Putra Malaysia Kampus Bintulu Sarawak (UPMKB). / Specifically for undergraduate study programs offered at Universiti Putra Malaysia Bintulu Sarawak Campus (UPMKB)

2. Kursus Teras / Core Courses (68 Jam Kredit / Credit Hours)

KOD KURSUS / COURSE CODE	NAMA KURSUS/COURSE NAME	Kr	K	A	PRASYARAT / PREREQUISITE	(√) Jika lulus/ if passed
FHH3101	Sains Kayu / <i>Wood Science</i>	3	2	1	Tiada / None	
FHM3112	Kaedah Kuantitatif Dalam Perhutanan/ <i>Quantitative Methods in Forestry</i>	4	3	1	Tiada / None	
FHM3201	Survei Hutan / <i>Forest Survey</i>	3	2	1	Tiada / None	
FHM3206	Sistem Maklumat Geografi Dalam Perhutanan / <i>Geographic Information System in Forestry</i>	3	2	1	Tiada / None	
FHM3303	Pengurusan Hidupan Liar / <i>Wildlife Management</i>	3	2	1	Tiada / None	
FHM3108	Entomologi Hutan / <i>Forest Entomology</i>	2	1	1	Tiada / None	
FHM3109	Patologi Hutan / <i>Forest Pathology</i>	2	1	1	Tiada / None	
FHM3203	Sivikultur Hutan / <i>Forest Silviculture</i>	4	3	1	Tiada / None	
FHM3107	Tanah Hutan / <i>Forest Soil</i>	3	2	1	Tiada / None	
FHM3103	Dendrologi Dipterokarpa / <i>Dendrology of Dipterocarps</i>	2	1	1	Tiada / None	
FHM3104	Dendrologi Bukan Dipterokarpa / <i>Dendrology of Non-Dipterocarps</i>	2	1	1	Tiada / None	

FHM3105	Fisiologi Pokok / <i>Tree Physiology</i>	3	2	1	Tiada / None	
FHM3106	Ekologi Hutan / <i>Forest Ecology</i>	3	2	1	Tiada / None	
FHS4959	Disertasi Bacelor / <i>Bachelor Dissertation</i>	6	0	6	Tiada / None	
FHS4903	Latihan Industri / <i>Industrial Training</i>	8	0	8	Tiada / None	
FHS4904	Kem Perhutanan / <i>Forestry Camp</i>	1	0	1	Tiada / None	
FHM3202	Sukatatan Hutan / <i>Forest Mensuration</i>	3	2	1	Tiada / None	
FHM3301	Pengurusan Hutan / <i>Forest Management</i>	3	2	1	Tiada / None	
FHM3306	Undang-Undang Dalam Perhutanan / <i>Laws in Forestry</i>	3	3	0	Tiada / None	
FHM3110	Ekonomi Perhutanan / <i>Forestry Economics</i>	3	3	0	Tiada / None	
FHM3305	Pengurusan Kawasan Legeh / <i>Watershed Management</i>	3	2	1	Tiada / None	

3. Kursus Elektif / *Elective Courses* (36 Kredit / *Credits*)

Pelajar perlu mengambil sebanyak 30 kredit (9 kredit dari kursus generik dan 21 kredit dari pakej) daripada senarai kursus yang dipakejkan dan 6 kredit elektif bebas

KOD KURSUS / <i>COURSE</i> CODE	NAMA KURSUS / <i>COURSE</i> NAME	Kr	K	A	PRASYARAT / <i>PREREQUISITE</i>	(√) Jika lulus/ if passed
KURSUS ELEKTIF GENERIK / <i>GENERIC ELECTIVE COURSES</i> (Pilih / <i>Choose</i> 9 kredit / <i>credits</i>)						
FHM3204	Kejuruteraan Hutan / <i>Forest Engineering</i>	3	2	1	Tiada / None	
FHH3201	Hasil Hutan Bukan Kayu / <i>Non-Wood Forest Products</i>	3	2	1	Tiada / None	
FHM4206	Pengukuran Dan Pemantauan Karbon/ <i>Carbon Measurement and Monitoring</i>	3	2	1	Tiada / None	
FHM4101	Biodiversiti dan Pemuliharaan / <i>Biodiversity and Conservation</i>	3	2	1	Tiada / None	
FHM4202	Penilaian Ekonomi Sumber Hutan Dan Biodiversiti / <i>Economic Valuation of Forest Resource and Biodiversity</i>	3	2	1	Tiada / None	
PAKEJ ELEKTIF PERHUTANAN LADANG / <i>ELECTIVE PACKAGE</i> (Pilih / <i>Choose</i> 21 kredit / <i>credits</i>)						
FHM3217	Sistem Penuaian Dalam Ladang Hutan/ <i>Harvesting System in Forest Plantations</i>	3	2	1	Tiada / None	
FHM3307	Penyelenggaraan Dan Pengurusan Tapak Semaian / <i>Nursery Management and Maintainance</i>	2	1	1	Tiada / None	
FHM3304	Pengurusan Hutan Ladang / <i>Forest Plantation Management</i>	3	2	1	Tiada / None	
FHM3309	Pensijilan Ladang Hutan / <i>Forest Plantation Certification</i>	2	1	1	Tiada / None	
FHM4201	Penderiaan Jauh Dalam Perhutanan / <i>Remote Sensing in Forestry</i>	3	2	1	Tiada / None	

FHM3308	Pengurusan Kebakaran Dalam Ladang Hutan / <i>Fire Management in Forest Plantations</i>	2	1	1	Tiada / None	
FHH3230	Kualiti Dan Hasil Kayu / <i>Wood Quality and Products</i>	3	2	1	Tiada / None	
FHM4304	Pengurusan Konflik Dalam Ladang Hutan / <i>Conflict Management in Forest Plantations</i>	3	2	1	Tiada / None	
FHM4302	Konflik Manusia Dan Hidupan Liar / <i>Human and Wildlife Conflicts</i>	3	3	0	Tiada / None	
FHM3218	Penghasilan Bahan Tanaman Hutan Ladang / <i>Planting Material Production for Forest Plantation</i>	3	2	1	Tiada / None	
FHM3214	Teknologi Biji Benih / <i>Seed Technology</i>	2	1	1	Tiada / None	
FHM4203	Perhutanan Antarabangsa / <i>International Forestry</i>	2	2	0	Tiada / None	
FHM3213	Perhutanan Tani / <i>Agroforestry</i>	3	2	1	Tiada / None	

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

Nota / Notes :

Pelajar diwajibkan memilih 2 kredit daripada kursus kokurikulum yang ditawarkan oleh universiti./ It is *compulsory* for students to take 2 credits of co-curriculum courses offered by the university.

SKEMA PENGAJIAN/ STUDY SCHEME

TAHUN 1 / 1ST YEAR

SEMESTER 1/ 1ST SEMESTER

KOD KURSUS / COURSE CODE	NAMA KURSUS / COURSE NAME	Kr	K	A
LPE2403	Interaksi Akademik dan Pembentangan / <i>Academic Interaction and Presentation</i>	3	2	1
PRT2008	Pertanian dan Manusia / <i>Agriculture and Man</i>	2	2	0
AFS2002	Program Buku Hijau / <i>Green Book Programme</i>	1	0	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
SKP3112*	Falsafah dan Isu Semasa/ <i>Philosophy and Current Issues</i>	2	2	0
SKP3113**	Falsafah dan Isu Semasa Masyarakat Sipil/ <i>Philosophy and Current Issues in Civil Society</i> atau/ or	3	3	0
atau/ or SKP3123**	Penghayatan Etika dan Peradaban di Malaysia/ <i>Internalization of Ethics and Civilization in Malaysia</i>			
FHM3103	Dendrologi Dipterokarpa / <i>Dendrology of Dipterocarps</i>	2	1	1
FHH3101	Sains Kayu / <i>Wood Science</i>	3	2	1
FHM3105	Fisiologi Pokok / <i>Tree Physiology</i>	3	2	1
QKK2101	Bakti Siswa (Kokurikulum 1 / <i>Cocurriculum 2</i>)	1	0	1
JUMLAH / TOTAL		20	14	6

SEMESTER 2 / 2ND SEMESTER

KOD KURSUS / COURSE CODE	NAMA KURSUS / COURSE NAME	Kr	K	A
LPE2503	Penulisan Akademik / <i>Academic Writting</i>	3	2	1
KOM3403	Pengucapan Awam / <i>Public Oration</i>	3	2	1
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
FHM3104	Dendrologi Bukan Dipterokarpa / <i>Dendrology of Non-Dipterocarps</i>	2	1	1
FHM3107	Tanah Hutan / <i>Forest Soil</i>	3	2	1
FHM3108	Entomologi Hutan / <i>Forest Entomology</i>	2	1	1
QKXxxxx	Kokurikulum 2 / <i>Cocurriculum 2</i>	1	0	1
JUMLAH / TOTAL		18	12	6

TAHUN 2 / 2ND YEAR

SEMESTER 1 / 1ST SEMESTER

KOD KURSUS / COURSE CODE	NAMA KURSUS / COURSE NAME	Kr	K	A
FHM3106	Ekologi Hutan / <i>Forest Ecology</i>	3	2	1
FHM3201	Survei Hutan / <i>Forest Survey</i>	3	2	1
FHM3202	Sukatatan Hutan / <i>Forest Mensuration</i>	3	2	1
FHM3203	Sivikultur Hutan / <i>Forest Silviculture</i>	4	3	1
FHM3112	Kaedah Kuantitatif Dalam Perhutanan / <i>Quantitative Methods in Forestry</i>	4	3	1
FHS4904	Kem Perhutanan / <i>Forestry Camp</i>	2	0	2
JUMLAH / TOTAL		19	12	7

SEMESTER 2 / 2ND SEMESTER

KOD KURSUS / COURSE CODE	NAMA KURSUS / COURSE NAME	Kr	K	A
FHM3109	Patologi Hutan / <i>Forest Pathology</i>	2	1	1
FHM3110	Ekonomi Perhutanan / <i>Forestry Economics</i>	3	3	0
FHM3206	Sistem Maklumat Geografi Dalam Perhutanan / <i>Geographic Information System in Forestry</i>	3	2	1
FHM3301	Pengurusan Hutan / <i>Forest Management</i>	3	2	1
FHM3303	Pengurusan Hidupan Liar / <i>Wildlife Management</i>	3	2	1
FHM3305	Pengurusan Kawasan Legeh / <i>Watershed Management</i>	3	2	1
FHM3306	Undang-Undang Dalam Perhutanan / <i>Laws in Forestry</i>	3	3	0
JUMLAH / TOTAL		20	15	5

TAHUN 3 / 3RD YEARSEMESTER 1 / 1ST SEMESTER

KOD KURSUS / COURSE CODE	NAMA KURSUS / COURSE NAME	Kr	K	A
FHM3204	Kejuruteraan Hutan / <i>Forest Engineering</i> (Elektif Generik 1)	3	2	1
FHM3304	Pengurusan Hutan Ladang / <i>Forest Plantation Management</i> (Elektif Pakej 1)	3	2	1
FHM3307	Penyelenggaraan Dan Pengurusan Tapak Semaian / <i>Nursery Management and Maintenance</i> (Elektif Pakej 2)	3	2	1

FHM4201	Penderiaan Jauh Dalam Perhutanan / <i>Remote Sensing in Forestry</i> (Elektif Pakej 3)	3	2	1
FHXxxxx	Elektif Generik 2 / <i>Generic Elective 2</i>	3	2	1
FHXxxxx	Elektif Generik 3 / <i>Generic Elective 3</i>	3	2	1
JUMLAH / TOTAL		18	12	6

SEMESTER 2 / 2ND SEMESTER

KOD KURSUS / COURSE CODE	NAMA KURSUS / COURSE NAME	Kr	K	A
FHS4959A	Disertasi Bacelor / <i>Bachelor Dissertation</i>	3	0	3
FHM3217	Sistem Penuaian Dalam Ladang Hutan / <i>Harvesting System in Forest Plantations</i> (Elektif Pakej 4)	3	2	1
FHM3309	Pensijilan Ladang Hutan / <i>Forest Plantation Certification</i> (Elektif Pakej 5)	2	1	1
XXXxxxx	Elektif Bebas 1 / <i>Open Elective 1</i>	3	2	1
XXXxxxx	Elektif Bebas 2 / <i>Open Elective 2</i>	3	2	1
JUMLAH / TOTAL		14	7	7

TAHUN 4 / 4TH YEAR

SEMESTER 1 / 1ST SEMESTER

KOD KURSUS / COURSE CODE	NAMA KURSUS / COURSE NAME	Kr	K	A
FHS4959B	Disertasi Bacelor / <i>Bachelor Dissertation</i>	3	0	3
MGM3180	Asas Keusahawanan / <i>Basic Entrepreneurship</i>	3	2	1
FHH3230	Kualiti Dan Hasil Kayu / <i>Wood Quality and Products</i> (Elektif Pakej 6)	3	2	1
FHM3308	Pengurusan Kebakaran Dalam Ladang Hutan / <i>Fire Management in Forest Plantations</i> (Elektif Pakej 7)	2	1	1
FHXxxxx	Elektif Pakej 8	2	1	1
JUMLAH / TOTAL		13	6	7

SEMESTER 2 / 2ND SEMESTER

KOD KURSUS / COURSE CODE	NAMA KURSUS / COURSE NAME	Kr	K	A
FHS4903	Latihan Industri / <i>Industrial Training</i>	8	0	8
JUMLAH / TOTAL		8	0	8

Nota / Notes :

1. Pelajar diwajibkan memilih 2 kredit daripada kursus kokurikulum yang ditawarkan oleh universiti. / *Students are required to select 2 credits from the cocurriculum courses offered by the university.*
2. Pelajar perlu melengkapkan pakej keperluan bahasa inggeris seperti jadual di bawah: Butiran lanjut mengenai CEL dan LAX sila rujuk di muka surat 3 buku panduan ini. / *Students need to complete the english package as the table below : For more details on CEL and LAX please refer to the page 3 of this book.*

SINOPSIS KURSUS / COURSE SYNOPSIS

Jabatan Sains Tanaman / Department Of Crop Science

AFS2001 Program Buku Hijau / Green Book Programme 2(0+2)

Prasyarat : Tiada

Kursus ini meliputi teknik penggunaan peralatan serta teknologi dalam amalan pertanian dan mengenal pasti kaedah yang sesuai dalam pengurusan aktiviti pertanian. Latihan dan kerja lapangan dilaksanakan dengan amalan pertanian yang baik.

This course covers techniques for using equipment and technology in agricultural practices and identifying appropriate methods in managing agricultural activities. Training and fieldwork are carried out with good farming practices.

AFS2002 Program Buku Hijau / Green Book Programme 1(0+1)

Prasyarat : Tiada

Kursus ini meliputi amalan dan teknologi yang digunapakai dalam sistem pengeluaran dan pengurusan pertanian. Latihan dan kerja lapangan dilaksanakan dengan amalan pertanian yang baik untuk mencapai kelestarian persekitaran.

This course covers practices and technologies used in agricultural production and management systems. Training and field work are carried out with good agricultural practices to achieve environmental sustainability..

CAG3005 Unsur Bioindustri / Elements of Bioindustry 2(2+0)

Prasyarat : Tiada

Kursus ini memfokus kepada pengetahuan dan proses manipulasi terkini biosumber negara untuk meningkatkan hasil primer dan pemprosesan produk agromakanan secara lestari. Keberkesanan pengurusan sistem pengeluaran bioindustri yang melibatkan integrasi bio-proses ke arah penghasilan produk akhir turut dibincangkan.

This course focuses on the knowledge and process of current manipulation of the national bioresources to enhance primary yields and sustainable agro-processing products. The efficacy of bioindustry production management systems involving integrated bio-processes towards final product production is also discussed.

CAG3006 Pengeluaran Tanaman Makanan Food Crops Production 3(2+1)

Prasyarat : Tiada

Kursus ini merangkumi kaedah pengeluaran dan pengurusan tanaman makanan secara lestari. Amalan penuaian dan pengendalian lepas tuai hasil dan hasilan agromakanan yang berkualiti turut ditekankan.

This course covers sustainable production and management of food crops. The harvesting and handling practices of agroproducts with good quality are also emphasized.

CAG3007 Pengeluaran Tanaman Industri / Industrial Crops Production 3(2+1)

Prasyarat : Tiada

Kursus ini meliputi prinsip pengeluaran, pengurusan, pemasaran dan ekonomi perladangan. Perbandingan sistem pengeluaran tanaman perladangan secara lestari turut dibincangkan

This course covers the principles of production, management, marketing and farming economy of industrial crops. Comparison of sustainable plantation production system is also discussed.

CAG3008 Fisiologi Tumbuhan / Plant Physiology 3(2+1)

Prasyarat : Tiada

Kursus ini merangkumi tindak balas biokimia dalam tumbuhan semasa proses percambahan biji benih, tumbesaran, penghasilan bunga dan buah yang berlaku dalam intra-sel dan ekstra-sel.

This course covers biochemical reaction in plant during germination, growth, flowering and fruiting initiation processes that occur within intra and extra cellular.

CAG3009 Asas Sains Tanaman / Basic Crop Science 2(1+1)

Prasyarat : Tiada

Kursus ini merangkumi prinsip dan amalan dalam pengurusan tanaman. Faktor semulajadi yang mempengaruhi tumbesaran tanaman dan teknologi yang digunakan dalam pengurusan perosak dan hasil lepas tuai diberi penekanan. Amalan pertanian yang mesra alam turut dibincangkan.

This course covers the principle and practices in managing crops. Environmental factors influencing crop growth and technologies used in the management of pests and post-harvest yield are emphasised. Environmental friendly farming practices are also discussed.

CAG3012 Fisiologi Lepas tuai / Post-Harvest Physiology 3(2+1)

Prasyarat : Tiada

Kursus ini merangkumi fisiologi lepas tuai komoditi hortikultur dan faktor yang mempengaruhi kualiti hasil. Kaedah untuk memanjangkan jangka hayat komoditi lepas tuai diberi penekanan. Dasar berkaitan pengeluaran dan keselamatan hasil makanan turut dibincangkan.

This course covers the physiology of post-harvest horticultural commodities and factors influencing the yield quality. Methods to extend post-harvest shelf life are emphasised. Policies on food production and safety are also discussed.

CAG4003 Ekonomi Botani / Economic Botany 3(2+1)

Prasyarat : Tiada

Kursus ini meliputi hubung kait antara manusia dan tumbuhan terutama bagaimana tumbuhan memberi sumbangan kepada manusia sejagat. Pengkomersialan tanaman dan hasilnya serta penggunaan tumbuhan dalam kepercayaan dan kehidupan harian masyarakat turut dibincangkan. Penilaian jenis-jenis tumbuhan penting dalam industri fiber, rempah ratus, makanan, minuman, perubatan dan kosmetik juga dirangkumi.

This course covers the link between humans and plants in particular how plants contribute to humanity. The commercialization of plants and their products and the use of plants in the beliefs and daily lives of communities are also discussed. Evaluation of important plant species in the fiber, spice industry, food, beverages, medicine and cosmetics is also included

CAG4004 Adaptasi Tanaman dan Perubahan Iklim Global / Crop Adaptation and Global Climate Change 3(2+1)

Prasyarat : Tiada

Kursus ini merangkumi kesan perubahan iklim terhadap mekanisma tumbuhan dalam ekosistem semula jadi. Fokus diberikan kepada tindakbalas tumbuhan terhadap perubahan iklim yang melibatkan perubahan tahap CO₂, UV-B, kitaran nutrien, suhu dan ketegasan air. Polisi berkenaan perubahan iklim dan kaedah untuk menanganinya turut dibincangkan.

This course covers the impact of climate change on plant mechanisms in natural ecosystem. The focus is on plant responses to climate change involving changes in CO₂, UV-B, nutrient cycles, temperature and water stress. Policies pertaining to climate change and the methods to overcome are also discussed.

CAT3106 Sisa Agrofiber dan Utilisasi / Waste and Agrofiber Utilization 3(2+1)

Prasyarat : Tiada

Kursus ini melibatkan pengurusan dan pemprosesan sisa agrofiber sebagai produk mesra alam yang dibenarkan bagi meningkatkan produktiviti industri pengeluaran dan mengurangkan masalah pencemaran.

This course involves the management and processing of waste agrofiber as an environmental friendly products that allowed to increase the production industry and reduce the pollution problem.

CAT4107 Pengurusan Sisa Bioindustri / Bioindustry Waste Management 3(2+1)

Prasyarat : Tiada

Kursus ini meliputi jenis dan pengurusan sisa bioindustri dan masalah pencemaran alam sekitar. Penekanan terhadap pengurusan, pemprosesan dan utilisasi sisa secara lestari turut dibincangkan.

This course covers the various types of bioindustrial wastes and environmental pollution problems. Emphasis on sustainable management, processing and utilization of waste are also discussed.

CAT4109 Teknologi Biobaja dan Biostimulan / Biofertilizer and Biostimulant Technology 3(2+1)

Prasyarat : Tiada

Kursus ini memberi pendedahan berkaitan peranan biobaja dan biostimulan di dalam sektor pertanian. Penekanan diberikan terhadap mikroorganisma yang berfaedah kepada tanaman menerusi interaksi tanaman-mikroorganisma dari sudut ekologi, fisiologi, biokimia dan genetik molekul. Strategi pengembangan dan pemasaran produk biobaja dan biostimulan juga turut dibincangkan.

This course introduces the roles of biofertilizer and biostimulant in the agricultural sector. Emphasis on beneficial microorganisms to the crop are highlighted through plant-microorganism interactions from aspects of ecology, physiology, biochemistry and molecular genetic. Extension and marketing strategies of biofertilizer and biostimulant products are also discussed.

CAT4001 Pembiakbakaan Tumbuhan / Plant Breeding 3(2+1)

Prasyarat : Tiada

Kursus ini merangkumi sistem pembiakan tumbuhan dan proses perwarisan. Penekanan diberi kepada kaedah pembiakbakaan yang melibatkan proses pemilihan induk sehinggalah ke proses penghibridan. Isu etika dalam pembiakbakaan dan ciri program pembiakbakaan yang berjaya turut dibincangkan.

This course covers physico-chemical and biochemical changes of plant based commodities during This course covers the plant breeding system and the heritability process. Emphasis is given on breeding methods involving the parent selection process until the hybridization process. Ethical issues in plant breeding and features of successful breeding programs are also discussed.)

CAT4100 Pertanian Persis / Precision Agriculture 3(2+1)

Prasyarat : Tiada

Kursus ini merangkumi konsep dan amalan pertanian persis dalam konteks pertanian moden yang lestari yang mengambilkira perkembangan teknologi pertanian dalam era teknologi maklumat. Penekanan diberikan kepada pengukuran variabiliti dan pemetaan persekitaran menggunakan peralatan canggih dan terkini dalam menentukan amalan pertanian persis yang sesuai. Penyediaan pangkalan data yang sesuai dan interpretasi maklumat yang betul turut dititikberatkan.

This course covers the concept and practice of precision agriculture in the context of sustainable modern agriculture that into account the development of agricultural technology in the information technology era. Emphasis is given on measurements of variability and environmental mapping using state-of-the-art equipment and tools in determining appropriate agricultural practices. Preparation of suitable database and correct information interpretation are also emphasized.

CAT4102 Kultur Tisu Tumbuhan / Plant Tissue Culture 3(2+1)

Prasyarat : Tiada

Kursus ini meliputi prinsip dan teknik pembiakan tumbuhan secara *in vitro*, dengan penekanan kepada sistem pengeluaran dan pengurusan semasa dan aplikasinya dalam pembiakan tanaman hortikultur terpilih.

This course covers principles and techniques of in vitro plant propagation, with emphasis on current production and management systems and their application in the propagation of selected horticultural crops.

CAT4103 Mikrobiologi Gunaan / Applied Microbiology 3(2+1)

Prasyarat : Tiada

Kursus ini merangkumi ciri morfologi dan kepelbagaian genetik mikrob serta faktor yang mempengaruhi pertumbuhannya. Penekanan diberikan kepada manipulasi perkembangan mikrob menerusi teknologi mikrobiologi. Kepentingan mikrob dalam bidang perindustrian turut dibincangkan.

This course covers morphological features and genetic diversity of microbes and factors affecting their growth. Emphasis is on the manipulation of microbial development through microbiological technology. The importance of microbes in the industry is also discussed.

CAT4105 Teknologi Fermentasi / Fermentation Technology 3(2+1)

Prasyarat : Tiada

Kursus ini merangkumi aspek penting teknologi fermentasi seperti pemencilan dan peningkatan strain mikrob untuk kegunaan industri. Penggunaan bioreaktor untuk melaksanakan teknik dan kinetik fermentasi yang berlainan turut dibincangkan. Penekanan adalah kepada penghasilan produk fermentasi dari sumber mikrob, haiwan dan tumbuhan.

This course covers an important aspect of fermentation technology such as isolation and enhancement of microbial strains for industrial use. The applications of bioreactors to perform different fermentation techniques and kinetics are also discussed. The emphasis is on the production of fermentation products from microbial sources, animals and plants.

CES3201 Pengembangan dan Jaringan Industri / Extension and Industrial Networking 3(1+2)

Prasyarat : Tiada

Kursus ini merangkumi kaedah pengembangan dan jaringan industri berkaitan bidang bioindustri. Kaedah pelaksanaan pengembangan dan pemindahan teknologi bersama komuniti dan industri turut dibincangkan.

This course encompasses methods of extension and industrial networking related to bioindustry field. Execution of extension and technology transfer with community and industry is discussed.

CFM3401 Pengurusan Ladang / Farm Management 3(3+0)

Prasyarat : Tiada

Kursus ini merangkumi elemen yang diperlukan dalam pengurusan sesebuah ladang. Keseluruhan proses pengurusan yang melibatkan penubuhan ladang sehinggalah ke pemasaran produk akan dibincangkan. Kepentingan tenaga buruh dan komunikasi serta sumbangan penyelidikan dalam aktiviti perladangan juga diberi penekanan.

This course covers the elements required in managing a farm. The whole process of management involving the establishment of farms to product marketing will be discussed. The importance of labor and communications as well as research contributions in farm activities are also emphasized.

CFP4959 Disertasi Bachelor / Bachelor Dissertation 6(0+6)

Prasyarat : Tiada

Kursus ini merangkumi penyediaan cadangan, pelaksanaan dan penulisan saintifik untuk sesuatu projek penyelidikan. Pendekatan saintifik bagi menjana data secara sistematik melalui rekabentuk, pengumpulan dan analisis data yang sesuai diberi penekanan.

This course covers the preparation of proposal, implementation and scientific writing of research project. Scientific approach to generate data systematically through appropriate design, data collection and analysis are emphasized.

CIT4902 Latihan Industri / Industrial Training 10(0+10)

Prasyarat : Tiada

Melalui kursus ini, pelajar didedahkan kepada persekitaran kerja yang sebenar di industri/organisasi. Latihan merangkumi aspek aplikasi teori dan praktikal yang telah dipelajari dengan amalan semasa di tempat kerja. Kemahiran menyelesaikan masalah dan komunikasi diberi penekanan.

In this course, students are exposed to real working environment in industries/organizations. Training includes application of the theoretical and practical aspects that have been studied with current practices in the workplace. Problem solving and communication skills are emphasized.

CPP3600 Perlindungan Tumbuhan / Plant Protection 3(2+1)

Prasyarat : Tiada

Kursus ini merangkumi perlindungan tumbuhan asas yang meliputi bidang entomologi dan patologi tumbuhan. Penekanan adalah kepada diagnosis penyakit dan perosak serta kaedah pengawalannya. Faktor genetik dan faktor persekitaran yang mempengaruhi perkembangan penyakit dan perosak turut dibincangkan.

This course covers basic plant protection covering the field of entomology and plant pathology. The emphasis is on the diagnosis of disease and pest and its regulatory methods. Genetic factors and environmental factors that affect the development of diseases and pests are also discussed.

CPP4600 Sains Racun Perosak/ Pesticide Science 3(2+1)

Prasyarat : Tiada

Kursus ini merangkumi aspek fiziko-kimia racun perosak dan penyakit. Perbincangan meliputi kaedah aplikasi racun, mekanisma tindakan dan interaksi dengan sistem hidupan sasaran. Faktor kerintangan dan impak penggunaan racun kepada alam sekitar turut diberi penekanan.

This course covers the physical and chemical aspects of pesticides and diseases. Discussions include pesticide application methods, action mechanisms and interactions with the target living systems. Resistance factors and the impact of pesticide usage on the environment are also emphasized.

CPT3801 Bioteknologi dalam Bioindustri / Biotechnology in Bioindustry 3(2+1)

Prasyarat : Tiada

Kursus ini meliputi penggunaan bioteknologi dalam bidang bioindustri. Perbincangan menjurus kepada teknologi yang terkini, proses yang terlibat dan aplikasinya dalam bidang bioindustri. Isu budaya dan etika dalam penggunaan bioteknologi dan pematuhan undang-undang sedia ada turut dibincangkan.

This course covers the use of biotechnology in the field of bioindustry. Discussion lead to the latest technology, processes involved and its applications in the field of bioindustry. Cultural and ethical issues regarding the use of biotechnology and compliance with existing laws are also discussed.

CPT3802 Pemrosesan Bioproduk / Bioproducts Processes 3(2+1)

Prasyarat : Tiada

Kursus ini merangkumi pemrosesan hasil sumber semulajadi dan bahan hasil industri pertanian untuk membentuk produk yang mempunyai nilai tambah. Pemilihan kaedah pemrosesan yang bersesuaian dengan bioproduk yang dihasilkan turut dibincangkan.

This course covers the processing of natural resources and agricultural products to form value added products. The selection of appropriate processing method with the bioproducts produced is also discussed.

CPT3803 Prinsip Biobahan dalam Bioindustri / Principal of Biomaterials in Bioindustry 2(2+0)

Prasyarat : Tiada

Kursus ini merangkumi konsep biobahan dalam bioindustri. Penekanan diberikan kepada biobahan polimer yang melibatkan aktiviti pertanian, pemrosesan dan pembungkusan makanan. Isu semasa yang melibatkan penggunaan biobahan polimer terhadap keselamatan makanan turut dibincangkan.

This course covers the concept of biomaterials in bioindustry. Emphasis is placed on biomaterial polymers involving agricultural, food processing and packaging activities. Current issues involving the usage of biomaterial polymers on food security are also discussed.

CPT4800 Kimia dan Pemrosesan Hasil Komoditi Tumbuhan / Chemistry and Processing of Plant Based Commodities 3(2+1)

Prasyarat : Tiada

Kursus ini merangkumi pengenalan kepada komoditi tumbuhan yang berbeza dan perubahan fisiko-kimia dan biokimia yang berlaku semasa pengendalian, pemrosesan dan penyimpanan. Perbincangan turut meliputi proses penghasilan produk makanan menggunakan komoditi tumbuhan yang berbeza.

This course covers the introduction of different plant commodities and the physical and chemical changes and biochemistry that occur during handling, processing and storage. Discussions also include the process of producing food products using different plant commodities.

CPT4803 Pemrosesan Produk Semulajadi / Natural Product Processing 3(2+1)

Prasyarat : Tiada

Kursus ini merangkumi konsep dan prinsip dalam pemrosesan produk semulajadi. Penekanan adalah kepada pemrosesan hasil tumbuhan dengan mengaplikasikan kaedah moden berteraskan perkembangan dalam bidang sains dan teknologi. Kepentingan pensijilan produk dan peraturan yang berkaitan turut dibincangkan.

This course covers concepts and principles in the processing of natural products. Emphasis is on the processing of plant products by applying modernized methods of development in science and technology. Importance of product certification and relevant regulations are also discussed.

CPT4805 Teknologi Pemrosesan Hiliran / Downstream Processing Technology 3(2+1)

Prasyarat : Tiada

Kursus ini merangkumi teknologi pemrosesan hiliran yang digunakan dalam pengeluaran bio-produk secara komersial. Penekanan adalah kepada kaedah pemrosesan dan teknologi yang digunakan dalam penghasilan produk hiliran yang berkualiti. Perkembangan terkini dalam industri pemrosesan hiliran turut dibincangkan.

This course covers downstream processing technologies used in commercial bio-product production. Emphasis is on the processing methods and technology used in producing quality downstream products. Recent developments in the downstream processing industry are also discussed.

CSS3700 Sains Tanah / Soil Science 3(2+1)

Prasyarat : Tiada

Kursus ini merangkumi pengenalan kepada kepentingan tanah sebagai sumber semulajadi yang tidak boleh diperbaharui. Penekanan diberikan kepada faktor yang mempengaruhi pembentukan tanah di samping sifat tanah yang menentukan kesuburan tanah. Proses pengelasan dan taksonomi tanah turut dibincangkan.

This course encompasses the introduction to the importance of soil as a non-renewable natural resource. Emphasis is given on factors affecting the formation of soil as well as soil properties that determine soil fertility. Soil classification process and taxonomy are also discussed.

CSS3701 Pengurusan Kesuburan Tanah dan Tanaman / Crop and Soil Fertility Management 3(2+1)

Prasyarat : Tiada

Kursus ini meliputi konsep kesuburan tanah dan kaitannya dengan produktiviti tanaman. Penekanan terhadap faktor utama yang mempengaruhi penyerapan nutrien tanaman dan pengurusan secara mampan terutamanya di tanah-tanah bermasalah turut dibincangkan.

This course covers the concept of soil fertility and its relation to crop productivity. Emphasis on the major factors affecting the absorption of plant nutrients and sustainable management, especially in problematic soils are also discussed.

CSS3703 Klimatologi / Climatology 2(2+0)

Prasyarat : Tiada

Kursus ini merangkumi konsep klimatologi dalam ekologi. Penekanan diberikan kepada komponen iklim yang melibatkan cuaca dan komposisi atmosfera yang mempengaruhi kitar biologi dan alam semulajadi. Isu semasa yang melibatkan perubahan iklim global terhadap produktiviti pertanian turut dibincangkan.

This course covers the concept of climatology in ecology. Emphasis is placed on the climate components involving weather and atmospheric composition which affect the biological cycles and nature. Current issues involving global climate change on the agriculture productions are also discussed.

CSS3704 Prinsip Ekologi Pencemaran / Principles of Pollution Ecology 2(2+0)

Prasyarat : Tiada

Kursus ini merangkumi aspek ekotoksikologi dan biodiversiti dengan penumpuan kepada punca serta kesan pencemaran pada persekitaran ekologi yang berbeza. Penekanan dibuat terhadap kesan pencemaran, kaedah pengukuran dan kaedah pemuliharaan. Isu semasa berkenaan pencemaran turut dibincangkan.

This course covers the aspects of ecotoxicology and biodiversity focusing on causes and effects of pollution in different ecological environment. Emphasis is on the impact of pollution, measurement methods and rehabilitation methods. Current issues concerning pollution are also discussed.)

CSS4702 Sifat dan Toksikologi Bahan Cemar / Properties and Toxicology of Pollutants 3(2+1)

Prasyarat : Tiada

Kursus ini merangkumi aspek sifat toksikologi bahan cemar yang tertumpu kepada punca serta kesan pencemaran. Penekanan dibuat terhadap kesan pencemaran, pengangkutan bahan cemar, sumber dan ciri bahan cemar, kaedah pengukuran dan kaedah rawatan. Isu pencemaran pada peringkat nasional dan juga global turut dibincangkan. Kursus ini juga memfokus kepada dasar dan akta yang berkaitan.

This course covers toxicology and waste aspects that focuses on the sources and effects of pollution. Emphasis is on the effects of pollution, transportation of contaminants and pollutants, source and characteristics of pollutants, methods of assessment and treatments. Pollution issues at the national and international levels are also discussed. This course also focuses on the related policies and acts.

PRT2008 Pertanian dan Manusia / Agriculture and Man 2(2+0)

Prasyarat : Tiada

Kursus ini merangkumi evolusi pertanian daripada permulaan kepada masa kini sebagai aktiviti terancang untuk sekuriti makanan dan penjanaan kekayaan, didorong oleh kemajuan ekonomi serta teknologi secara lestari. Pertanian moden dipaparkan sebagai sains, seni dan bisnes yang meliputi peranan dan impaknya terhadap penggunaan sumber dan pembangunan manusia.

This course encompasses the evolution of agriculture from the beginning to the present as a planned activity for food security and wealth creation driven by economic development and technology in a sustainable manner. Modern agriculture is presented as a science, an art and a business encompassing its role and impact on resource utilization and human development.

SAB4401 Pemasaran Produk Agrobio / Marketing of Agrobio Product 3(3+0)

Prasyarat : Tiada

Kursus ini memfokus kepada prinsip pemasaran dan pendekatan yang digunakan dalam pemasaran produk agrobio. Elemen pengurusan yang merangkumi pengeluaran sehinggalah ke pengagihan produk agrobio diterangkan. Aktiviti promosi produk agrobio dan risiko pemasaran yang wujud juga turut dibincangkan.

This course focuses on marketing principles and approaches used in the marketing of agrobio products. The management element that covers production until the distribution of agrobio products is explained. Promotion activities of agrobio products and existing marketing risks are also discussed.

SEC3102 Ekonomi Bioindustri / Bioindustrial Economics 2(2+0)

Prasyarat : Tiada

Kursus ini merangkumi konsep ekonomi dalam bioindustri. Penekanan diberikan kepada elemen pemasaran yang melibatkan aktiviti pengurusan, pendekatan dan keseimbangan pasaran. Isu semasa dalam ekonomi bioindustri serta dasar dan akta yang berkaitan juga turut dibincangkan.

This course covers the concept of economy in bioindustry. Emphasis is placed on marketing elements involving market management, approaches and equilibrium. Current issues in bioindustrial economics as well as related policies and acts are also discussed.)

SFB3100 Biologi Sel dan Genetik / Cell Biology and Genetic 3(2+1)

Prasyarat : Tiada

Kursus ini memperkenalkan struktur dan fungsi sel dan membincangkan proses semulajadi yang terlibat dalam mempengaruhi perkembangan sel. Pengecaman organisma menggunakan kaedah morfologi dan biomolekul akan turut diliputi. Kesan hormon dan enzim ke atas perkembangan sel mikroorganisma juga akan dibincangkan.

This course introduces the structure and function of cells and discuss the natural processes involved in influencing cell development. Identification of organisms using morphological and biomolecular methods will also be covered. The effect of hormones and enzymes on the development of microorganism cells will also be discussed.

SFC3001 Kimia Fizik dan Tak Organik / Physical and Inorganic Chemistry 3(2+1)

Prasyarat : Tiada

Kursus ini merangkumi beberapa aspek asas dalam kimia fizik dan tak organik. Fokus diberikan kepada pengenalan kimia kumpulan utama dalam jadual berkala dan juga kepada jenis ikatan kimia yang wujud. Tindakbalas kimia yang melibatkan proses elektrokimia dan elektrodinamik turut dibincangkan.

This course covers some basic aspects of physics and inorganic chemistry. The focus is on the introduction of main groups of chemicals in the periodic table as well as on the types of chemical bonds that exist. Chemical reactions involving electrochemical and electrodynamic processes are also discussed.

SFC3201 Biokimia / Biochemistry

3(2+1)

Prasyarat : Tiada

Kursus ini merangkumi proses biokimia dalam sistem eukariot. Penekanan diberikan kepada pengenalan empat kelas utama makromolekul biologi dan peranannya dalam sel. Fungsi kawalan tindakbalas oleh enzim dan hormon di samping aliran maklumat biologi menerusi proses metabolisme dan fotosintesis turut dibincangkan.

This course covers biochemical processes in the eukaryotic system. Emphasis is given on the introduction of four major classes of biological macromolecules and their roles within cells. Response control functions by enzymes and hormones as well as biological information flow through the process of metabolism and photosynthesis are also discussed.

SFM3201 Biostatistik / Biostatistic

3(3+0)

Prasyarat : Tiada

Kursus ini menyediakan asas berkaitan statistik yang melibatkan pengumpulan data dan jenis data. Penekanan diberikan kepada jenis ujian statistik yang berbeza bergantung kepada kesesuaian jenis data yang dikumpul. Ujian perbandingan, korelasi dan regresi juga turut dibincangkan.

This course provides a statistical basis that involves data collection and data types. Emphasis is given on different types of statistical tests depending on the type of data collected. Comparative tests, correlation and regression are also discussed.

Jabatan Sains Haiwan dan Perikanan / Department of Animal Science and Fishery

PPT3301 Prinsip Pengurusan dan Pemasaran Pertanian / Principles of Agricultural Management and Marketing 3(3+0)

Prasyarat : Tiada

Kursus ini merangkumi konsep asas pengurusan dan pemasaran pertanian, persekitaran pasaran serta kesan dasar kerajaan terhadap perniagaantani.

This course encompasses basic concepts of agricultural marketing and management, marketing environment and influence of government policies on agribusiness.

PPT3701 Keusahawanan Pertanian / Agricultural Entrepreneurship 3(1+2)

Prasyarat : Tiada

Kursus ini merangkumi konsep keusahawanan, ciri usahawan, penyediaan pelan perniagaan, pelaksanaan projek, pemasaran, kredit, strategi dan pengurusan sumber serta isu semasa mengenai keusahawanan dalam pertanian.

This course covers the concepts of entrepreneurship, the characteristics of an entrepreneur, preparation of a business plan, implementation of project marketing, credit, business strategies, management of resources and current issues of entrepreneurship in agriculture.

EPT3102 Ekonomi Pertanian / Agricultural Economics 3(2+1)

Prasyarat : ECN3100

Kursus ini merangkumi aplikasi konsep asas teori ekonomi dalam bidang pertanian serta kaitannya dengan struktur pasaran, penawaran dan permintaan, dasar kerajaan, dan perdagangan antarabangsa.

This course covers the application of basic concept of economic theory in the field of agriculture and its relation to market structure, supply and demand, government policies, and international trade.

TKP3206 Pengembangan Akuakultur / Aquaculture Extension 2(1+1)

Prasyarat : Tiada

Kursus ini merangkumi kemahiran dan pengetahuan untuk membangunkan program dan latihan yang berkesan dalam khidmat pengembangan akuakultur kepada komuniti. Projek pengembangan dalam akuakultur dilaksana berdasarkan pembangunan ekonomi dan komuniti.

This course covers the skills and knowledge to develop effective programs and training in aquaculture extension services to community. Extension projects in aquaculture are conducted based on economics and community development.

AKU3103 Ikhtiologi / Ichthyology 3(2+1)

Prasyarat : Tiada

Kursus ini merangkumi kepelbagaian biologi dan ekologi ikan. Perbandingan struktur, tabiat dan keupayaan penyesuaian ikan di ruang geografi yang berbeza dibincangkan.

This course covers the diversity of fish biology and ecology. Comparison in structural, behavioural and adaptive ability of fishes in diverse geographical spaces are discussed.

AKU3105 Biologi Invertebrat Akuatik / Biology of Aquatic Invertebrates 3(2+1)

Prasyarat : Tiada

Kursus ini meliputi diversiti dan ciri biologi kumpulan dan spesies invertebrat akuatik yang hidup dalam ekosistem marin dan air tawar. Pertalian ciri adaptasi dan kemandirian invertebrat dengan struktur dan sistem biologinya ditekankan.

The course covers diversity and biological characteristics of groups and species of aquatic invertebrates living in marine and freshwater ecosystems. Relationship between adaptation and survival of invertebrates with its structure and biological system is emphasised.

AKU3106 Botani Akuatik / Aquatic Botany 3(2+1)

Prasyarat : Tiada

Kursus ini meliputi taksonomi dan pengkelasan, ciri morfologi penting bagi setiap kumpulan utama tumbuhan akuatik berdasarkan persekitaran air tawar dan marin. Kegunaan, kepentingan dan ancaman terhadap tumbuhan akuatik dibincangkan.

This course covers the taxonomy and classification, important characteristic for each main group of aquatic plants based on the freshwater and marine environments. Utilization, importance and threats to aquatic plants are discussed.

AKU3108 Statistik Dan Penyelidikan Dalam Akuakultur / Statistics and Research in Aquaculture 4(3+1)

Prasyarat : Tiada

Kursus ini merangkumi asas statistik dan analisis data dalam akuakultur dan perikanan. Kursus ini menekankan interpretasi hasil analisis data dalam situasi sebenar, selain menekankan rekabentuk eksperimen dengan menggunakan formulasi statistik yang sesuai.

This course covers the fundamental of statistics and data analysis in aquaculture and fisheries. This course emphasises on interpretation of results of data analysis in the real-life situation, besides emphasises on the experimental design using appropriate statistical formulation.

AKU3109 Fisiologi Ikan dan Biokimia / Fish Physiology and Biochemistry 3(2+1)

Prasyarat : Tiada

Kursus ini merangkumi sistem, fungsi dan komponen utama fisiologi untuk homeostasis berterusan dalam hidupan akuatik. Proses biokimia dan fisiologi ikan yang relevan dengan persekitaran dan pelbagai laluan metabolisme dalam organisma akuatik ditekankan.

This course covers the main system, function and physiological components for continuous homeostasis in aquatic life. Biochemical and fish physiological processes relevant to the environment and various metabolic pathways in aquatic organisms are emphasized.

AKU3201 Prinsip Akuakultur / Principles Of Aquaculture 3(2+1)

Prasyarat : Tiada

Kursus ini merangkumi prinsip asas akuakultur untuk sekuriti makanan. Proses yang terlibat dalam pra-produksi, produksi, dan pasca-produksi akuakultur yang lestari mengikut piawaian yang ditetapkan dibincangkan.

This course covers basic principle of aquaculture for food security. The processes involved in pre-production, production and post-production of sustainable aquaculture according to standard practices are discussed.

AKU3210 Kultur Ikan / Finfish Culture 3(1+2)

Prasyarat : Tiada

Kursus ini merangkumi pengkulturan dan pengurusan ikan makanan air tawar dan marin. Penekanan diberi kepada penjagaan, pengurusan pemakanan, pengurusan air, amalan akuakultur baik dan pengendalian pasca tuai.

This course covers culture and management of food fish both in fresh and seawater. This course emphasises husbandry, feed management, water management, good aquaculture practices and post harvest handling.

AKU3301 Genetik dan Pembiakbakaan Ikan / Fish Genetics And Breeding 3(2+1)

Prasyarat : Tiada

Kursus ini merangkumi konsep genetik, pembiakbakaan ikan, penghibridan dan kejuruteraan genetik. Penyelesaian masalah dalam pemilihan baka ikan dibincangkan.

This course covers concepts of fish genetics, breeding, hybridisation and genetic engineering. Problem solving for selective breeding in fish are discussed.

AKU3302 Teknologi Pembenihan Ikan dan Pengurusan Fri / Fish Seed Technology And Fry Management 3(2+1)

Prasyarat : Tiada

Kursus ini merangkumi biologi pembiakan ikan, teknik pembenihan ikan, larvikultur, pengurusan, pembungkusan dan pengangkutan fri. Permasalahan dalam pembiakan ikan dibincangkan

This course covers fish reproductive biology, fish seed production techniques, larviculture, management, packaging and transportation of fry. Issues in fish breeding are discussed.

AKU3401 Pemakanan Akuakultur / Aquaculture Nutrition 3(2+1)

Prasyarat : Tiada

Kursus ini merangkumi amalan penyediaan dan pemberian makanan dalam akuakultur. Nutrisi dalam bahan makanan untuk pertumbuhan optima haiwan akuatik, isu semasa dan kekangan dalam pemakanan akuakultur diberi penekanan.

This course covers preparation and feeding practices in aquaculture. Nutrition in feed ingredients for optimal growth of aquatic animals, current issues and limitations in aquaculture nutrition are emphasized.

AKU3501 Pengurusan Kesihatan Ikan / Fish Health Management 3(2+1)

Prasyarat : Tiada

Kursus ini merangkumi konsep patologi, mikrobiologi dan parasitologi berhubung dengan penyakit ikan, tatacara diagnosis, kawalan dan rawatan. Kepentingan amalan pengurusan yang baik, pengawalan dan pencegahan penyakit dalam akuakultur dibincangkan.

This course covers concepts of pathology, microbiology and parasitology in relation to fish diseases, diagnostic procedures, control and treatment. The importance of good husbandry, control and prevention of diseases in aquaculture are discussed.

AKU3601 Kualiti Air dan Tanah dalam Akuakultur / Water and Soil Quality in Aquaculture 3(2+1)

Prasyarat : Tiada

Kursus ini merangkumi teori dan penentuan kualiti air dan tanah untuk pemilihan tapak. Analisis dan tafsiran kimia dan fizikal air dan tanah diberi penekanan.

This course covers theory and determination of water and soil quality for site selection. Analysis and interpretation of physico chemical of water and soil are emphasized.

AKU3602 Ekologi Akuatik / Aquatic Ecology 3(2+1)

Prasyarat : Tiada

Kursus ini meliputi komponen utama ekologi akuatik dan teknik ukuran parameter ekologi. Impak negatif terhadap ekosistem akuatik dan kaedah pemantauan serta pemulihan dibincangkan.

This course covers the major components of aquatic ecology and ecological parameters measurement techniques. Negative impacts towards aquatic ecosystem as well as the monitoring and the remediation techniques are discussed.

AKU3801 Pasca Tuai Dalam Akuakultur/ Postharvest In Aquaculture 3(2+1)

Prasyarat : Tiada

Kursus ini merangkumi pengendalian pelbagai produk akuakultur, pemprosesan dan pengawalan kualiti. Produk akuatik ditambah nilai dan sampingan dibincangkan.

This course covers handling of various types of aquatic produce, processing and quality control. Value added product and byproduct of aquatic produce are discussed.

AKU3802 Inovasi dalam Akuakultur / Innovation in Aquaculture 3(1+2)

Prasyarat : Tiada

Kursus ini merangkumi teori dan inovasi produk, kekangan dan cabaran dalam sektor akuakultur. Kreativiti dan inovasi produk dan teknologi akuakultur ditekankan.

This course covers theory and product innovation, constraint and challenges in aquaculture sector. Creativity and innovation of product and aquaculture technology are emphasized.

AKU4101 Penilaian dan Pengurusan Sumber Perikanan / Fisheries Resource Assessment and Management 3(1+2)

Prasyarat : Tiada

Kursus ini merangkumi pengelasan sumber perikanan, teknik penangkapan ikan dan polisi, dinamik populasi dan pengurusan perikanan. Aplikasi perisian komputer dalam penilaian stok ikan dan pengurusan sumber perikanan yang lestari dibincangkan.

This course covers the classification of fishery resources, fishing techniques and policies, population dynamics and management of fisheries. Application of computer software in fish stock assessment and sustainable fisheries resource management are discussed

AKU4102 Limnologi / Limnology 3(2+1)

Prasyarat : Tiada

Kursus ini merangkumi komponen biotik dan produktiviti biologi dalam ekosistem air tawar serta proses fiziko-kimia yang mempengaruhinya. Kepentingan dan aplikasi limnologi dalam pengurusan Perikanan darat dan akuakultur ditekankan.

This course covers the biotic components and biological productivity of fresh water ecosystems and the physico-chemical processes affecting them. The importance and application of limnology in inland fisheries and aquaculture management are emphasized.

AKU4103 Oseanografi / Oceanography 3(2+1)

Prasyarat : Tiada

Kursus ini merangkumi faktor fizikal, kimia dan biologi dalam ekosistem lautan. Impak aktiviti antropogenik, perubahan iklim dan penyelesaian kepada kesan tersebut dibincangkan untuk kelestarian perikanan dan akuakultur.

This course covers physical, chemical and biological factors in marine ecosystems. Impacts of anthropogenic activities, climate change and the solutions are discussed for the sustainability of fisheries and aquaculture.

AKU4202 Kultur Ikan dan Tumbuhan Hiasan Akuatik / Culture of Ornamental Fish and Aquatic Plants 3(1+2)

Prasyarat : Tiada

Kursus ini merangkumi pengkulturan ikan dan tumbuhan hiasan akuatik terpilih. Kaedah dan manipulasi dalam pengkulturan serta pengurusan ikan dan tumbuhan hiasan akuatik yang berpotensi untuk pengkomersialan dibincangkan.

This course covers the cultures of selected ornamental fishes and aquatic plants. Methods and manipulation of cultures as well as management of potential ornamental fishes and plants for commercialization are discussed.

AKU4203 Sistem Pengeluaran Akuakultur / Aquaculture Production Systems 3(2+1)

Prasyarat : Tiada

Kursus ini merangkumi reka bentuk, pemilihan peralatan asas dan pembinaan pelbagai sistem akuakultur. Pengurusan dan kecekapan sistem untuk operasi optima dibincangkan.

This course covers design, basic equipment selection and construction of various aquaculture systems. The management and efficiency of the systems for optimal operation are discussed.

AKU4204 Kultur Spesies Unik / Unique Species Culture 2(2+0)

Prasyarat : Tiada

Kursus ini merangkumi teknik kultur dan pengurusan pelbagai spesies akuatik unik di perairan Malaysia. Spesies unik marin dan air tawar yang belum dikultur secara komersial dalam industri akuakultur di Malaysia ditekankan. Kegunaan produk dari setiap spesies unik dibincangkan.

The course encompasses the culture techniques and management of various unique aquatic species in Malaysian waters. Marine and fresh water unique species which are yet to be cultured commercially in Malaysian aquaculture industry are emphasised. Usage of product from each unique species are discussed.

AKU4221 Kultur Krustasea / Crustacean Culture 3(1+2)

Prasyarat : Tiada

Kursus ini merangkumi biologi dan kemahiran pengkulturan krustasea komersial terpilih. Isu dan permasalahan dalam industri kultur haiwan krustasea dibincangkan.

This course covers the biology and skills of culture on selected commercial crustaceans. Issues and problems in crustacean culture industry are discussed.

AKU4231 Kultur Moluska / Mollusc Culture 3(1+2)

Prasyarat : Tiada

Kursus ini meliputi kultur spesies moluska komersial. Penambahbaikan spesies yang dikultur melalui pemilihan genetik dan manipulasi prosedur pengkulturan ditekankan. Pemuliharaan dan pengurusan dalam akuakultur ekstraktif organik dibincangkan.

The course covers the culture of commercial mollusc species. Improvement of cultured species through genetic selection and manipulation of culture procedures are emphasised. Conservation and management in organic extractive aquaculture are discussed.

AKU4301 Endokrinologi Ikan / Fish Endocrinology 3(2+1)

Prasyarat : Tiada

Kursus ini merangkumi biosintesis kimia, struktur dan fungsi hormon daripada kelenjar endokrin. Permasalahan berkaitan dengan endokrinologi ikan ditekankan. Tindakbalas dan peranan hormon terhadap tekanan fizikal dan kimia dalam persekitaran akuatik dibincangkan.

This course covers the chemical biosynthesis, structures and functions of hormones from the endocrine glands. Problems related to fish endocrinology are emphasised. Reaction and roles of hormones on physical and chemical stresses in aquatic environment are discussed.

AKU4401 Teknologi Makanan Akuakultur / Aquafeed Technology 3(1+2)

Prasyarat : Tiada

Kursus ini meliputi pelbagai rumusan makanan ikan dan teknologi pembuatan. Setiap peringkat pemprosesan dan pengawalan mutu makanan untuk industri akuakultur ditekankan.

This course covers various formulation and technologies for fish feed production. Every stage of feed processing and quality control for aquaculture industry are emphasized.

AKU4402 Pengeluaran Makanan Hidup dalam Akuakultur / Live Food Production in Aquaculture 3(2+1)

Prasyarat : Tiada

Kursus ini merangkumi kepentingan pengeluaran makanan hidup dalam akuakultur. Jenis, teknik pengeluaran serta penyediaan makanan hidup dalam industri akuakultur diberi penekanan.

This course covers the importance of live food production in aquaculture. Types, production techniques and preparation of live food in aquaculture industry are emphasized.

AKU4243 Kultur Alga / Algae Culture 3(2+1)

Prasyarat : Tiada

Kursus ini merangkumi pelbagai teknik pembiakan dan pengkulturan mikroalga dan makroalga. Alga komersial terpilih dari segi kepentingan ekologi dan ekonomi dibincangkan.

This course covers various propagation and culture techniques for microalgae and macroalgae culture. Selected commercial algae based on ecological and economical importance are discussed.

AKU4501 Mikrobiologi Akuatik / Aquatic Microbiology 3(2+1)

Prasyarat : Tiada

Kursus ini merangkumi peranan, kesan, teknik pengesanan dan hubungan mikroorganisma dalam akuakultur. Kepentingan, aplikasi dan isu semasa mikrobiologi dalam akuakultur dibincangkan.

This course covers the roles, effects, identification techniques and relations of microorganisms in aquaculture. The importance, applications and current issues of microbiology in aquaculture are discussed.

AKU4502 Imunologi Ikan / Fish Immunology 3(2+1)

Prasyarat : Tiada

Kursus ini merangkumi konsep, jenis, tindak balas dan pengawal ubah imun dalam sistem imuniti ikan. Kepentingan dan aplikasi imunologi ikan untuk pencegahan penyakit dalam akuakultur dibincangkan.

This course covers the concepts, types, responses and immunomodulators in fish immune system. The importance and application of fish immunology for diseases prevention in aquaculture are discussed.

AKU4601 Ekologi dan Pengurusan Tanah Basah / Ecology and Management of Wetlands 3(2+1)

Prasyarat : Tiada

Kursus ini merangkumi pelbagai ekosistem tanah basah semulajadi dan buatan, fungsi dan kepentingannya. Pengurusan pelbagai ekosistem tanah basah dan faktor yang mempengaruhi sumber hidupnya akibat perubahan iklim dan persekitaran dibincangkan.

This course covers the various natural and constructed wetland ecosystems, function and their importance. Management of various wetland ecosystems and factors affecting their living resources due to climate change and environment are discussed.

AKU4701 Teknologi Maklumat dan Komunikasi Dalam Akuakultur / Information and Communications Technology in Aquaculture 3(1+2)

Prasyarat : Tiada

Kursus ini merangkumi kegunaan dan kepentingan teknologi maklumat dan komunikasi (ICT) dalam akuakultur. Kesesuaian teknologi maklumat dan komunikasi dalam operasi dan pengurusan akuakultur dibincangkan.

This course covers the utilization and importance of information and communications technology in aquaculture. The suitability of communications and information technology in aquaculture operation and management is discussed.

AKU4801 Perikanan Rekreasi Dalam Ekopelancongan Perairan Darat / Recreational Fisheries in Inland Waters Ecotourism 3(2+1)

Prasyarat : Tiada

Kursus ini merangkumi konsep biologi dan sosio-ekonomi pengurusan perikanan rekreasi sebagai alternatif dalam pengurusan sumber. Pelaksanaan dan operasi perikanan rekreasi di Malaysia dan aspek eko-pelancongan dibincangkan.

This course covers on the concept of biology and socio-economic in recreational fisheries management as alternatives for resource management. Implementation and operation of recreational fisheries in Malaysia and aspect of eco-tourism are discussed.

AKU4802 Biologi Molekul Dalam Akuakultur / Molecular Biology in Aquaculture 3(2+1)

Prasyarat : Tiada

Kursus ini merangkumi konsep dan teknik biologi molekul untuk sel tumbuhan, haiwan dan mikrob akuatik. Aplikasi teknologi kejuruteraan genetik dan isu semasa bioteknologi dalam akuakultur dibincangkan.

This course covers concepts and molecular biology techniques for cells of plants, animals and aquatic microbes. Application of genetic engineering and current issues of biotechnology in aquaculture are discussed.

AKU4804 Polisi dan Akta Untuk Perikanan dan Akuakultur / Policy and Acts for Fisheries and Aquaculture 2(2+0)

Prasyarat : Tiada

Kursus ini merangkumi polisi, akta dan perundangan dalam bidang perikanan dan akuakultur. Pelaksanaan peraturan dan undang-undang perikanan dan akuakultur ditekankan. Kepentingan penguatkuasaan dalam mengurus sumber perikanan dan akuakultur dibincang.

This course covers the policy, act and legislation in fisheries and aquaculture. Implementation of rules and law in fisheries and aquaculture are emphasised. The importance of enforcement in fisheries and aquaculture resource management are discussed.

AKU4901 Latihan Industri / *Industrial Training*

12(0+12)

Prasyarat : Persetujuan Penyelaras

Kursus ini melibatkan penempatan pelajar di ladang akuakultur swasta atau kerajaan. Pendedahan praktikal kepada keadaan pekerjaan dan amalan pengurusan sebenar dalam bidang akuakultur dan perikanan diberikan penekanan melalui projek jangka pendek.

This course involves student attachment at a private or government aquaculture farm. A practical exposure to the actual working conditions and management practices carried out in the field of aquaculture and fisheries are emphasised through short term projects.

AKU4959 Disertasi Bachelo / *Bachelor Dissertation*

6 (0+6)

Prasyarat : Tiada

Kursus ini merangkumi sorotan bahan rujukan, penggunaan teknik penyelidikan yang sesuai, pengumpulan dan analisis data, penafsiran keputusan, perbincangan, kesimpulan dan keaslian kajian saintifik dalam projek penyelidikan.

This course covers literature review, use of appropriate research techniques, data collection and analyses, interpretation of results, discussion, conclusion and originality of scientific studies in research project.

Jabatan Sains Perhutanan/ Department of Forestry Science

FHH3101 Sains Kayu / Wood Science 4(3+1)

Prasyarat : Tiada

Kursus ini memperkenalkan kepada pelajar berkenaan kepentingan kayu dalam kehidupan manusia. Pengajaran akan menumpu kepada sifat anatomi, kimia, fizikal, dan mekanikal kayu serta perkaitannya dalam pemprosesan dan penghasilan produk berasas kayu. Pelajar akan didedahkan kepada teknik pengecaman pelbagai spesies kayu komersil

This course introduces student on the importance of wood to human life. The teaching will focus on the anatomical, chemical, physical, and mechanical properties of wood in relation to the processing and production of wood-based products. The student is exposed to the identification technique of various commercial wood species

FHH3201 Hasil Hutan Bukan Kayu / Non-Wood Forest Products 3(2+1)

Prasyarat : Tiada

Kursus ini merangkumi sejarah, jenis hasil hutan bukan kayu seperti rotan, buluh, fitokimia tumbuhan ubatan dan palma. Proses pengumpulan dan agihan menggunakan teknologi sesuai dalam proses pembuatan produk akhir untuk pembangunan industri desa serta sosio-ekonomi

This course covers the history, types of non-wood forest products, i.e., rattan, bamboo, phytochemicals, medicinal plants and palms. Collection and its distribution process by means of appropriate technology in manufacturing end products towards the development of cottage industries as well as socio-economic development.

FHH3230 Kualiti Dan Hasil Kayu / Wood Quality and Products 3(2+1)

Prasyarat : Tiada

Kursus ini merangkumi pengetahuan asas tentang kayu hutan ladang dan penggunaannya. Struktur dan sifat kayu serta kaedah untuk meningkatkan mutu kayu ditekankan. Kesan dan pengaruh penanaman semula termasuk kaedah pemangkasan, pemilihan dan pengeluaran balak ke atas kualiti kayu dibincangkan.

This course encompasses the basic knowledge about forest plantation woods and its utilization. Wood structure and properties as well as methods to improve wood quality are emphasized. Impact and effects of replanting including pruning, selection and production of quality timbers are discussed

FHM3103 Dendrologi Dipterokarpa / Dendrology of Dipterocarps 3(2+1)

Prasyarat : Tiada

Kursus ini memperkenalkan kepada pelajar dendrologi dalam perhutanan dan taksonomi tumbuhan. Pengajaran menumpu kepada morfologi untuk pengecaman tumbuhan Gimnosperma dan Angiosperma. Pelajar juga didedahkan kepada nilai kepelbagaian tumbuhan dan habitatnya.

This course introduces student to dendrology in forestry and plant taxonomy. The teaching focuses on morphological characters for identification of Gymnosperm and Angiosperm. Students are also exposed to value of diversities of plants and its habitats.

FHM3104 Dendrologi Bukan Dipterokarpa / Dendrology of Non-Dipterocarps 2(1+1)

Prasyarat : Tiada

Kursus ini membincangkan dendrologi famili bukan Dipterokarpa. Penekanan diberikan kepada tatanama moden, habitat tumbuhan, kekunci pengecaman, petunjuk botani dan pengumpulan spesimen herbarium. Huraian famili dan genus bukan dipterokarpa serta kepentingannya dalam perhutanan dibincangkan.

This course discuss on the dendrology of family non-Dipterocarps. Emphasizes are on modern nomenclature, plant habitats, keys identification, botanical indicators and collection of herbarium specimens. Description on family and genera for non-dipterocarps and its importance in forestry is discussed.

FHM3105 Fisiologi Pokok / Tree Physiology 3(2+1)

Prasyarat : Tiada

Kursus ini merangkumi peranan, fungsi dan proses fisiologi pokok dalam ekosistem perhutanan seperti fotosintesis, metabolisme karbohidrat, asimilasi dan respirasi. Hubungkait antara proses fisiologi pokok dengan faktor persekitaran seperti penyerapan, pergerakan dan kehilangan air dari pokok dan pembiakan seksual dan aseksual dibincangkan. Kursus ini menumpukan kepada teknik pengukuran fisiologi pokok yang bersesuaian.

This course covers the role, function and process of tree physiology within forest ecosystem includes photosynthesis, carbohydrate metabolism, assimilation and respiration. The relationship between tree physiological processes with environmental factor such as absorption, movement and loss of water, and sexual and asexual reproductions is discussed. This course focusses on the appropriate techniques for tree physiological measurement.

FHM3106 Ekologi Hutan / Forest Ecology 3(2+1)

Prasyarat : Tiada

Kursus ini memberi penekanan kepada konsep ekologi yang mencakupi faktor persekitaran seperti faktor edafik, iklim dan biotik yang mempengaruhi perkembangan tumbuhan, pengelasan hutan serta dinamik komuniti tumbuhan dan proses seperti pengeluaran bahan organik, aliran tenaga dan kitaran nutrient.

This course emphasises on ecological concept, including environmental factors such as edaphic, climatic and biotic variables that influence the growth and development of vegetation, forest classification as well as community dynamics and processes such as organic matter production, energy flow and nutrient cycling.

FHM3107 Tanah Hutan / Forest Soil 3(2+1)

Prasyarat : Tiada

Kursus ini merangkumi topik sains tanah termasuk sifat kimia, fizikal dan biologi; pengecaman dan pengelasan tanah, kesan aktiviti hutan terhadap ciri tanah serta indeks tapak.

This course covers topics in soil sciences including chemical, physical and biological properties, soil classification and identification, effects of forest activities on soil properties as well as site index.

FHM3108 Entomologi Hutan / Forest Entomology 2(1+1)

Prasyarat : Tiada

Kursus ini merangkumi kaedah mengenal pasti dan pengelasan serangga hutan terpilih. Pelajar dapat memahami ekologi, biologi dan kepentingan serangga berkaitan dengan pokok hutan asli, hutan ladang dan hutan bandar. Penelitian kaedah diagnosis, persampelan dan pengawalan serangga perosak pokok berasaskan kepada prinsip pengurusan serangga perosak bersepadu ditekankan.

This course encompasses the identification and classification of selected forest insects. Students will understand the ecology, biology and importance of insects associated with natural forest, plantation and urban forest. Methods of diagnosing, sampling and tree insect pest control based on insect pest management principles are emphasized.

FHM3109 Patologi Hutan / Forest Pathology 2(1+1)

Prasyarat : Tiada

Kursus ini merangkumi konsep penyakit pokok, simptom dan tanda penyakit. Penekanan diberi kepada faktor di dalam pembentukan penyakit, diagnosis penyakit, pengelasan kulat patogen, biologi patogen yang penting, dan patogenesis. Hubung kait hos dan patogen, mekanisme pertahanan dan kaedah pengawalan bagi penyakit pokok hutan juga dibincangkan.

This course covers plant disease concept, disease symptoms and signs. Emphasis is given on factors in disease formation, disease diagnosis, classification of fungal pathogen, biology of important pathogens and pathogenesis. Host and pathogen interaction, defense mechanism, and control methods for forest tree diseases are also discussed.

FHM3110 Ekonomi Perhutanan / Forestry Economics 3(3+0)

Prasyarat : Tiada

Kursus ini merangkumi konsep dan teori dalam ekonomi perhutanan. Ini termasuklah struktur pasaran, ekonomi pengeluaran, permintaan dan penawaran barangan perkhidmatan hutan. Penekanan diberikan kepada penilaian ekonomi sumber hutan dan bayaran ke atas perkhidmatan ekosistem (PES). Analisis pelaburan projek perhutanan, serta peranan sektor perhutanan dalam pembangunan ekonomi dibincangkan.

This course covers concepts and theories in forest economic. These include of market structure, production economics, demand and supply of forest goods and services. Economic valuation of forest resources and payment for ecosystem services (PES) are emphasized. Investment analysis of forestry projects, and the role of forestry sector in national economic development are discussed.

FHM3112 Kaedah Kuantitatif Dalam Perhutanan / Quantitative Methods in Forestry 4(3+1)

Prasyarat : Tiada

Kursus ini merangkumi pemerihaln dan analisis data parametrik dan bukan parametrik dalam perhutanan. Penekanan diberikan kepada pola pembolehubah rawak dan taburan umum parametrik. Teknik pensampelan, rekabentuk ujikaji, ralat ujikaji, korelasi dan regresi linear dibincangkan.

This course covers parametric and non-parametric of data description and analyses in forestry. The pattern of random variables and some common distributions of parameters are emphasized. Sampling techniques, experimental designs, experimental errors, correlations and linear regression are discussed

FHM3201 Survei Hutan / Forest Survey**3(2+1)**

Prasyarat : Tiada

Kursus ini merangkumi prinsip asas survei hutan, teknik ukuran linear dan sudut yang digunakan dalam perhutanan. Kandungan kursus termasuk kaedah pengukuran kawasan hutan dan penyediaan pelan. Teknik pengiraan ketepatan data dan pembetulan yang bersesuaian dibincangkan.

This course covers the basic principles of forest survey, technique of linear and angular measurements which are applied in forestry. The content of this course includes methods of forest area measurement and plan preparation. Calculation technique for data accuracy and appropriate corrections are discussed

FHM3202 Sukatan Hutan / Forest Mensuration**3(2+1)**

Prasyarat : Tiada

Kursus ini merangkumi prinsip pengukuran dan pengukuran pokok, dengan memberi penekanan kepada perkaitan antara , penaksiran dan pembolehubah pokok dan dirian hutan., Pertambahan dan pertumbuhan hasil, indeks tapak, stok, kepadatan dirian, termasuk perancangan dan pelaksanaan inventori sumber hutan berdasarkan teknik pensampelan yang digunakan di Malaysia turut dibincangkan.

This course covers the principles of measurement and tree measurement with emphasis on relationship between assessment and tree and stand variables. Growth and yield increment, site index, stocking, stand density including planning and conducting forest resource inventory according to sampling techniques used in Malaysia are also discussed.

FHM3203 Sivikultur Hutan / Forest Silviculture**3(2+1)**

Prasyarat : Tiada

Kursus ini merangkumi konsep dan teori silvikultur, system silvikultur am yang diamalkan dalam perhutanan tropika. Penekanan diberikan kepada perkembangan sistem silvikultur di Malaysia termasuk sistem dan kaedah terkini. Diantara aspek yang dibincangkan adalah pengenalan dan penubuhan lading hutan serta rawatan silvikultur yang bersesuaian.

This course encompasses the concepts and theory of silviculture, general silvicultural systems practiced in tropical forest.,Emphasized is given to the development of silviculture system in Malaysia that includes the current systems and methods. Aspects of introduction and establishment of forest plantation as well as appropriate silviculture treatments are discussed.

FHM3204 Kejuruteraan Hutan / Forest Engineering**3(2+1)**

Prasyarat : Tiada

Kursus ini merangkumi kejuruteraan hutan, sains bahan binaan, penganalisaan kestabilan tebing dan dinding penahan, torque, rimpul, jentera perhutanan terpilih serta ekonomi kejuruteraan hutan yang merangkumi kos mesin dan penggantian termasuk penilaian kos alternative.

This course encompasses forest engineering, building material science, analysis of slope stability and retaining wall, torque, rimpull, selected forest machinery as well as economics of forest engineering including costs of machinery and replacement,including evaluation of alternative costs.

FHM3206 Sistem Maklumat Geografi Dalam Perhutanan / Geographic Information System in Forestry 3(2+1)

Prasyarat : Tiada

Kursus ini merangkumi konsep asas sistem maklumat geografi (GIS). Kandungan kursus termasuk kaedah reka bentuk dan pembangunan pengkalan data, automasi, pemprosesan, analisis, paparan dan pemodelan data. Ia penting untuk menyokong proses membuat keputusan, termasuk kajian kes system maklumat geografi dalam perhutanan.

This course covers basic concepts of geographic information system (GIS). The content of this course includes method of design and data base development, automation, processing, analysis, display, and modelling of data. It is to support decision making, including case studies of GIS in forestry.

FHM3213 Perhutanan Tani / Agroforestry 3(2+1)

Prasyarat : Tiada

Kursus ini memperkenalkan prinsip dan amalan perhutanan tani di kawasan tropika. Pengajaran akan memfokuskan kepada jenis amalan perhutanan tani, interaksi sistem perhutanan tani dengan alam sekitar dan sosial. Analisa ekonomi digunakan untuk menentukan hasil pulangan yang positif terhadap sistem perhutanan tani yang diamalkan.

This course introduces principle of tropical agroforestry system in tropic. The teaching focuses on appropriate systems and the interactions of the agroforestry system with the environment and social. Economic analysis is used to assess the positive return of the agroforestry system.

FHM3214 Teknologi Biji Benih / Seed Technology 2(1+1)

Prasyarat : Tiada

Kursus ini merangkumi isu berkaitan dengan pengeluaran biji benih bagi spesis pokok hutan terpilih dan tanaman serat. Penekanan terhadap teknologi biji benih dan kesannya kepada hasil dan kualiti biji benih akan dibincangkan. Aspek fisiologi pengeluaran biji benih termasuk fenologi, dormansi dan penyimpanan; serta keputusan sistem sokongan seperti pensijilan biji benih dan penyelidikan biji benih diberi penekanan.

The course discussed issue related to seed production of selected forest species and fibre crops. Seed technology and its potential effects on the yield and quality of seeds are emphasized. Physiological aspects of seed production including phenology, dormancy and storage; and the decision support system such as seed certification and seed research are emphasized

FHM3217 Sistem Penuaian Dalam Ladang Hutan / Harvesting System in Forest Plantations 3(2+1)

Prasyarat : Tiada

Kursus ini membincangkan penyediaan pelan penuaian ladang hutan secara berkekalan. Ia merangkumi proses menganalisa kadar pengeluaran balak, kos penuaian, dan pengawalan kos. Aspek penting dalam pembinaan jalan ladang hutan, sistem dan teknik penuaian ladang hutan dan kitaran tebangan di ladang hutan dibincangkan.

This course will discuss the preparation of sustainable forest plantation harvesting plan. It includes analyzing the rate of timber production, harvesting costs, and controlling costs. Important aspects within the construction of forest plantations roads, planted forest harvesting systems and techniques, and cutting cycle in forest plantation are discussed.

FHM3218 Penghasilan Bahan Tanaman Hutan Ladang / *Planting Material* 3(2+1)
Production for Forest Plantation

Prasyarat : Tiada

Kursus ini merangkumi pelbagai kaedah biologi dalam menghasilkan bahan tanaman ladang hutan. Ini termasuklah pembiakan semula jadi tumbuhan, kultur tisu, pemilihan genetik, DNA rekombinan dan tumbuhan transgenik. Penekanan diberikan dalam menghasilkan produk yang berkualiti bagi mencapai matlamat operasi ladang hutan.

The course comprises various techniques in producing plant material for forest plantations. These includes natural breeding, tissue culture, genetic selection, DNA recombinant and transgenic plant. Emphasis is given in producing a quality product to achieve the operational goals of forest plantations.

FHM3301 Pengurusan Hutan / *Forest Management* 3(2+1)

Prasyarat : Tiada

Kursus ini merangkumi fungsi dan kepentingan pengurusan hutan secara berkekalan di Malaysia. Amalan dan piawaian pengurusan hutan antarabangsa berkaitan dengan hasil berkekalan, giliran dan pusingan tebangan, pengendalian stok, hasil dan kawalan tebangan berkaitan sistem pengurusan hutan di Malaysia dibincangkan. Penekanan diberi kepada keperluan pensijilan hutan dan pengesahan produk kayu dari sumber yang berkekalan.

This course covers the functions and importance of sustainable 220 forest management in Malaysia. The principles and standard of international forest management related to the sustainable yield, rotation and cutting cycle, the manipulation of growing stock, yield, and regulation of fellings related to forest management system in Malaysia are discussed. Forest certification and verification of forest products from sustainable forest are emphasized.

FHM3303 Pengurusan Hidupan Liar / *Wildlife Management* 3(2+1)

Prasyarat : Tiada

Kursus ini merangkumi pengelasan dan aspek ekologi hidupan liar di Malaysia termasuk dinamik populasi, keperluan habitat, tekanan dan gangguan kepada habitat asal. Pengukuran populasi melalui teknik pensampelan bagi anggaran populasi ditekankan. Prinsip pengurusan hutan bagi hidupan liar termasuk pemuliharaan, status kini dan masa hadapan, fungsi agensi, dasar dan polisi negara dan kesedaran umum dibincangkan

The course encompasses classification and ecological aspect of wildlife in Malaysia includes population dynamics, habitat requirement, pressure and disturbance of original habitat. Population measurement through sampling techniques for population estimation is emphasized. Principles of forest management towards wildlife, conservation, current and future status, functions of agencies, national policies and public awareness is discussed.

FHM3304 Pengurusan Hutan Ladang / *Forest Plantation Management* 3(2+1)

Prasyarat : Tiada

Kursus ini merangkumi penubuhan dan pengurusan tapak semeaian sehingga tempoh kematangan hutan ladang. Penekanan diberikan kepada aktiviti hutan ladang termasuklah pengurusan sumber biji benih, penyediaan tapak, penanaman, jarak tanaman, pembajaan, perlindungan, penjarangan, pemangkasan dan giliran. Isu dan amalan baik dalam pengurusan hutan ladang.

This course encompasses the establishment and nursery management until maturity of forest plantation. Activities of forest plantation includes management of seed sources, site preparation, planting, enspace, fertilization, protection, thinning, pruning and rotation are emphasized. Issues and good practices in forest plantation management are covered

FHM3305 Pengurusan Kawasan Legeh / Watershed Management 3(2+1)

Prasyarat : Tiada

Kursus ini merangkumi masalah air dan langkah untuk mengatasinya, edaran hidrologi, kawasan tadahan hutan dan hubungannya dengan air hujan, air tanah, pemelupaan, air larian, banjir dan hakisan, kaedah kawalan kuantiti dan kualiti air dalam pengurusan kawasan legeh serta masalah sosial yang berkaitan.

The course covers water problems and approaches to their solutions, hydrological cycle, water catchment area and its relation to rainfall, ground water, evapotranspiration, runoff, floods and soil erosion, control methods for water quality and quantity in watershed management as well as related social problems.

FHM3306 Undang-Undang Dalam Perhutanan / Laws in Forestry 3(3+0)

Prasyarat : Tiada

Kursus ini merangkumi peruntukan undang-undang dalam sektor perhutanan termasuk undang-undang berkaitan sumber semula jadi, alam sekitar, hidupan liar, taman negara dan air serta industri hiliran. Perbezaan undang-undang di negeri-negeri berkaitan akan ditekankan. Penggunaan undang-undang dalam menangani masalah pengurusan hutan semasa dibincangkan.

This course encompasses provisions of laws in forestry sectors including natural resource, environment, wildlife, national parks, water and upstream industries. Differences between related state laws are emphasized. Application of laws to solve current forest management are discussed.

FHM3307 Penyelenggaraan Dan Pengurusan Tapak Semaian / Nursery Management and Maintenance 2(1+1)

Prasyarat : Tiada

Kursus ini membincangkan asas penubuhan tapak semaian mengikut amalan baik bagi tujuan pemuliharaan dan perniagaan. Penekanan diberi kepada teknik penubuhan tapak semaian, penyelenggaraan tumbuhan dan infrastruktur tapak semaian. Teknik menghasilkan stok tanaman dan pemasaran tumbuhan dibincangkan.

This course discusses basic of nursery establishment based on good practices for conservation and business purposes. Emphasized are given on nursery establishment techniques, plant and infrastructure maintenance. Plant propagation techniques and plant marketing are discussed

FHM3308 Pengurusan Kebakaran Dalam Ladang Hutan / Fire Management in Forest Plantations 2 (1+1)

Prasyarat : Tiada

Kursus ini meliputi konsep dan punca kebakaran ladang hutan. Ia menghuraikan kesan kebakaran kepada tanah, tumbuhan dan hidupan liar. Pelajar didedahkan kepada Fire Danger Rating System untuk Asia Tenggara dan aplikasinya dalam pengurusan kebakaran ladang hutan.

This course covers the concept and causes of fire in forest plantations. It explains effects of forest fire on soil, plants and wildlife. Students are exposed to Fire Danger Rating System for Southeast Asia and it's application in the management of fire in forest plantations.

FHM3309 **Pensijilan Ladang Hutan / Forest Plantation Certification** **2(1+1)**

Prasyarat : Tiada

Kursus ini memberikan satu gambaran mengenai tujuan dan keperluan Kriteria dan Petunjuk Bagi Pensijilan Pengurusan Ladang Hutan Malaysia (MC&I Forest Plantations). Ia menerangkan pemahaman dan pentafsiran 10 prinsip and 55 kriteria MC&I Forest Plantations. Peranan badan pentabdir national dalam membangunkan standard pensijilan dan proses pensijilan lain dikaji.

This course provides an overview of the purpose and requirements of the Malaysian Criteria and Indicators for Forest Plantation Management Certification (MC&I Forest Plantations). It explains on the understanding and interpretation of the 10 principles and 55 criteria of MC&I Forest Plantations. Role of national governing body in developing certification standards and other certification processes are studied.

FHM4101 **Biodiversiti dan Pemuliharaan / Biodiversity and Conservation** **3(2+1)**

Prasyarat : Tiada

Kursus ini merangkumi teori dan prinsip dalam skop biodiversiti dan pemuliharaan termasuk definisi, aras biodiversiti, definisi spesies, habitat, ekosistem dan kepentingan biodiversiti. Penekanan diberikan pada teknik pengukuran, penilaian dan pemantauan biodiversiti bagi tujuan pemuliharaan. Isu semasa, dasar biodiversiti kebangsaan, pengurusan dan mekanisme dalam pemuliharaan biodiversiti turut diliputi.

This course encompasses theory and principle in biodiversity and conservation that includes definition, level in biodiversity, definition of species, habitat, ecosystems and importance of biodiversity. Emphasis is given on measuring technique, assessment and biodiversity monitoring for conservation. Current issues, national biodiversity policy, management and mechanism for biodiversity conservation are covered.

FHM4201 **Penderiaan Jauh Dalam Perhutanan / Remote Sensing in Forestry** **3(2+1)**

Prasyarat : Tiada

Kursus ini memperkenalkan kepada pelajar teori asas penderiaan jauh dan prinsip asas pemprosesan imej satelit. Pengajaran akan memfokus kepada penggunaan perisian pemprosesan imej yang bersesuaian dengan aktiviti perhutanan. Pelajar akan diberi peluang untuk menganalisis data lapangan.

This course introduces students to basic theory on remote sensing and basic principles of satellite image processing. The teaching focuses on appropriate used image processing software. The student will be given the opportunity to analyze field data.

FHM4202 **Penilaian Ekonomi Sumber Hutan Dan Biodiversiti /** **3(2+1)**
Economic Valuation of Forest Resource and Biodiversity

Prasyarat : Tiada

Kursus ini merangkumi konsep asas dan kaedah dalam menjalankan penilaian ekonomi sumber hutan dan biodiversiti. Penekanan diberikan ke atas pembangunan mampan, kepentingan sumber hutan dan biodiversiti, masalah berkaitan dengan nyah hutan, konsep dan teori utiliti dan ekonomi kebajikan, jenis-jenis nilai ekonomi, pendekatan penilaian ekonomi, langkah terlibat dan kaedah penilaian ekonomi, perakaunan sumber hutan dan aplikasi penilaian ekonomi dalam perhutanan. Kajian kes dalam penilaian ekonomi sumber hutan dan biodiversiti dibincangkan.

This course covers the basic concepts and methods in conducting economic valuation of forest and biological resources. Emphasis is given on sustainable development, the importance of forest and biological resources, problems related to deforestation, concept and theory of utility and welfare economics, types of economic value, approaches in economic valuation, steps involved and methods of economic valuation, forest resource accounting and applications of economic valuation. Case studies in economic valuation of forest resources and biodiversity are covered.

FHM4203 **Perhutanan Antarabangsa / International Forestry** **2(2+0)**

Prasyarat : Tiada

Kursus ini merangkumi status, klasifikasi hutan dunia dan isu semasa global berkaitan dengan sektor perhutanan. Perbincangan berkisar kepada organisasi perhutanan global dan nasional dan perjanjian antarabangsa serta kaitannya dengan pengurusan hutan.

This course covers status, classification of forest and current global issues related to forestry sectors. Discussion on global and national forestry organizations, and international treaty related to forest management.

FHM4206 **Pengukuran Dan Pemantauan Karbon / Carbon Measurement** **3(2+1)**
and Monitoring

Prasyarat : Tiada

Kursus ini merangkumi peranan hutan dengan perubahan iklim. Kerjasama antarabangsa oleh pelbagai pihak berkaitan untuk mengurangkan kesan perubahan iklim dunia dibincangkan. Penekanan diberikan keatas kaedah pengukuran dan pemantauan karbon di kawasan berhutan.

This course encompasses the role of forests in climate change. International cooperation by various related agencies in reducing the impact of global climate change is discussed. Emphasis is given on methods in measurement and monitoring of carbon in the forested area.

FHM4302 **Konflik Manusia Dan Hidupan Liar / Human and Wildlife** **3(3+0)**
Conflicts

Prasyarat : Tiada

Kursus ini merangkumi konsep pengurusan konflik dan peranan manusia dan hidupan liar. Pemahaman fungsi ekosistem dan keupayaan daya tampung sesuatu habitat ditekankan dalam penilaian konflik. Kaedah mitigasi untuk menangani konflik antara manusia dan hidupan liar ditekankan.

This course covers concept of conflict management and roles of human and wildlife. The understanding of ecosystem functions and carrying capacity are emphasized in evaluating human and wildlife conflicts. Mitigation methods for solving human and wildlife conflicts are emphasized.

FHM4304 **Pengurusan Konflik Dalam Ladang Hutan / *Conflict Management in Forest Plantations*** **3(2+1)**

Prasyarat : Tiada

Kursus ini merangkumi konsep pengurusan konflik serta peranan manusia dalam mengurus ladang hutan. Kursus ini memberi fokus kepada konflik manusia dengan hidupan liar di ladang hutan. Kaedah untuk menangani konflik antara manusia dan sumber hutan serta isu tuntutan tanah dibincangkan.

This course covers conflict management concept, roles of human in managing forest plantations. The course focuses on human conflicts to wildlife in forest plantation. Methods for dealing with conflicts between human and forest resources and land claims issues are discussed.

FHS4903 **Latihan Industri / *Industrial Training*** **8(0+8)**

Prasyarat : Tiada

Melalui kursus ini, pelajar didedahkan kepada persekitaran kerja yang sebenar di industri/organisasi. Latihan merangkumi aspek aplikasi teori dan praktikal yang telah dipelajari dengan amalan semasa di tempat kerja. Kemahiran menyelesaikan masalah dan komunikasi turut diberi penekanan.

In this course, students are exposed to real working environment in industries/organizations. Training includes application of the theoretical and practical aspects that have been studied with current practices in the workplace. Problem solving and communication skills are also emphasized.

FHS4904 **Kem Perhutanan / *Forestry Camp*** **2(0+2)**

Prasyarat : Tiada

Kursus ini meliputi pendedahan awal kepada pelajar berkenaan kepentingan ekosistem hutan kepada masyarakat dan negara. Pelajar juga dilatih dengan pelbagai kemahiran perhutanan di lapangan, di samping membentuk sahsiah dan nilai dalam diri pelajar.

This course covers early exposure to the students on the importance of forest ecosystem towards the society and nation. Students are also trained with various forestry skills in the field, as well as developing students' character and values.

FHS4959A/FHS4959B **Disertasi Bachelo / *Bachelor Dissertation*** **6(0+6)**

Prasyarat : Tiada

Kursus ini merangkumi penyediaan cadangan, pelaksanaan dan penulisan saintifik untuk sesuatu projek penyelidikan. Pendekatan saintifik bagi menjana data secara sistematik melalui rekabentuk, pengumpulan dan analisis data yang sesuai diberi penekanan.

This course covers the preparation of proposal, implementation and scientific writing of research project. Scientific approach to generate data systematically through appropriate design, data collection and analysis are emphasized

KURSUS TAWARAN FAKULTI LAIN

(Sila rujuk sinopsis pada fakulti berkenaan)

1. FAKULTI EKOLOGI MANUSIA

1.1	SKP2101	Kenegaraan Malaysia / <i>Malaysian Nationhood</i>	3(3+0)
1.2	SKP3112	Falsafah dan Isu Semasa / <i>Philosophy and Current Issues</i>	2(2+0)
1.3	SKP3122	Penghayatan Etika dan Peradaban / <i>Appreciation of Ethics and Civilizations</i>	2(2+0)

2. FAKULTI EKONOMI PENGURUSAN

2.1	MGM3180	Asas Keusahawanan / <i>Basic Entrepreneurship</i>	3(3+0)
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3. FAKULTI BAHASA MODEN DAN KOMUNIKASI

3.1	KOM3403	Pengucapan Awam / <i>Public Oratation</i>	3 (3+0)
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4. PUSAT PEMAJUAN KOMPETENSI BAHASA

4.1	LPE2403	Academic Interaction and Presentation	3 (2+1)
4.2	LPE2503	Academic Writing	3 (2+1)

5. FAKULTI PENGAJIAN PENDIDIKAN

5.1	FCE3204	Kemahiran Berfikir / <i>Thinking Skills</i>	2 (2+0)
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