

BUKU PANDUAN PROGRAM PENGAJIAN PRASISWAZAH

*UNDERGRADUATE STUDY
PROGRAMME HAND BOOK*



**SESI AKADEMIK
ACADEMIC SESSION
— 2017/2018 —**

**FAKULTI
SAINS DAN
TEKNOLOGI MAKANAN**
*FACULTY OF FOOD SCIENCE AND
TECHNOLOGY*

FAKULTI SAINS DAN TEKNOLOGI MAKANAN

Maklumat Am

Ditubuhkan dalam tahun 1982, Fakulti Sains dan Teknologi Makanan merupakan Fakulti yang aktif dan mempunyai reputasi tinggi sebagai sebuah Fakulti yang terbaik di Universiti Putra Malaysia. Fakulti ini mempamerkan dasar visi penubuhan Universiti untuk memenuhi keperluan negara dalam bidang sains dan teknologi makanan serta pengurusan dan khidmat makanan melalui pengajaran, penyelidikan, dan perkhidmatan profesional. Visi ini telah direalisasikan secara sistematik oleh kakitangan akademik dan sokongan Fakulti yang sangat komited dan sentiasa berkongsi pendapat dengan saintis di institusi akademik dan penyelidikan, industri dan pelanggan.

Tiga tunjang utama Fakulti adalah Jabatan Sains Makanan, Jabatan Teknologi Makanan, dan Jabatan Pengurusan dan Khidmat Makanan. Ketiga-tiga Jabatan mengamalkan kesepaduan persekitaran kerja yang interaktif di mana pendekatan sinergetik digunakan dalam menyumbang kepada kecemerlangan Fakulti Sains dan Teknologi Makanan.

Terdapat tiga program yang ditawarkan oleh Fakulti iaitu Bacelor Sains dan Teknologi Makanan, Bacelor Sains (Pengajian Makanan), dan Bacelor Sains (Pengurusan Perkhidmatan Makanan). Program Bacelor Sains dan Teknologi Makanan menekankan latihan keseluruhan dalam bidang sains dan teknologi makanan yang merangkumi kimia, mikrobiologi, pemprosesan dan kejuruteraan makanan. Manakala program Bacelor Sains (Pengajian Makanan) merupakan kurikulum komprehensif yang bakal menghasilkan graduan terlatih dan profesional dalam bidang pemprosesan, pengeluaran, pengurusan dan pemasaran makanan. Program Bacelor Sains (Pengurusan Perkhidmatan Makanan) pula di wujudkan bagi melahirkan graduan profesional yang menyeluruh meliputi aspek sains makanan, kulinari dan gastronomi, layanan dan keusahawanan serta berupaya menjalankan penyelidikan dan pembangunan dalam bidang perkhidmatan makanan.

FACULTY OF FOOD SCIENCE AND TECHNOLOGY

General Information

Established in 1982, the Faculty of Food Science and Technology is an active faculty which is highly regarded as one of the best faculties at Universiti Putra Malaysia. The faculty depicts the foundations of the vision for the establishment of the university to fulfill the nation's needs in the field of food science and technology as well as food management and services through teaching, research and professional services. This vision has been systematically realized by academic and supporting faculty staff whom are highly committed and frequently share ideas with scientists at academic and research institutions, industry and clients.

The three main pillars of the Faculty are the Department of Food Science, Department of Food Technology and the Department of Food Service and Management. All three departments have an integrated interactive working environment whereby a synergetic approach is adopted to contribute to excellence in the Faculty of Science and Technology.

The Faculty offers three programs i.e. Bachelor of Food Science and Technology, Bachelor of Science (Food Studies) and Bachelor of Science (Food Service Management). The Bachelor of Food Science and Technology program emphasizes on overall training in the field of food science and technology which include food chemistry, microbiology, processing and engineering. Meanwhile, the Bachelor of Science (Food Studies) program has a comprehensive curriculum designed to produce well-trained and professional graduates in the field of food processing, production, management and marketing. The Bachelor of Science (Food Service Management) program, on the other hand, was established to produce professional graduates who are well rounded in aspects of food science, culinary and

gastronomy, hospitality and entrepreneurship and are capable of conducting research and development in the field of food services.

Pengurusan Fakulti/ Faculty Management

Dekan/ Dean

Prof. Dr. Nazamid Saari

Timbalan Dekan (Akademik dan Hal Ehwal Pelajar)

Deputy Dean (Academic & Student Affairs)

Prof. Madya Dr. Sharifah Kharidah Syed Muhammad

Timbalan Dekan (Siswazah, Penyelidikan & Inovasi)

Deputy Dean (Postgraduate, Research & Innovation)

Prof. Dr. Azizah Abdul Hamid

Timbalan Dekan (Pembangunan dan Jaringan)

Deputy Dean (Development and Networking)

Prof. Madya Dr. Mohhidin Othman

Ketua Jabatan Sains Makanan

Head, Department of Food Science

Prof. Madya Dr. Anis Shobirin Meor Hussin

Ketua Jabatan Teknologi Makanan

Head, Department of Food Technology

Prof. Dr. Tan Chin Ping

Ketua Jabatan Pengurusan dan Khidmat Makanan

Department of Food Service and Management

Prof. Madya Dr. Roselina Karim

Ketua Penolong Pendaftar

Head Registrar Assistant

Pn. Zainaf Udin

Program Prasiswa yang ditawarkan/Undergraduate Programs being offered:

Bachelor/Bachelor

1. Bachelor Sains dan Teknologi Makanan/ *Bachelor of Food Science & Technology*
2. Bachelor Sains (Pengajian Makanan)/ *Bachelor of Science (Food Studies)*
3. Bachelor Sains (Pengurusan Perkhidmatan Makanan)/ *Bachelor of Science (Food Service Management)*

**SKEMA PENGAJIAN PAKEJ ELEX UNTUK PROGRAM 4 TAHUN
BERKUATKUASA UNTUK AMBILAN SEPTEMBER 2017 DAN SETERUSNYA
*ELEX SCHEME FOR 4 YEARS PROGRAMMES FROM SEPTEMBER INTAKE 2017 ONWARDS***

MUET Band	TOEFL/IELTS Score	CIEP Level	Graduation Requirements for 4-year programmes
1 & 2	-	107	3 BBI + 3 CEL + 24 LAX points
3 & 4	TOEFL 500 - 599 IELTS 5.5 - 6.5	108 – 109	2 BBI + 2 CEL + 24 LAX points
5 & 6	TOEFL 600 - 677 IELTS 7.0 - 9.0	-	2 BBI + 1 CEL + 24 LAX points OR 1 BBI + 1 CEL + 24 LAX points (with global language)

Sem	4 - Years Programme			
	MUET/UTEIS 1 & 2 CIEP 107	MUET 3 & 4 CIEP 108 - 109 TOEFL 500 - 599 IELTS 5.5 - 6.5	MUET/UTEIS 5 & 6 TOEFL 600 - 677 IELTS 7.0 - 9.0	
Sem 1	BBI2422	6 LAX points	6 LAX points	
Sem 2	6 LAX points	CEL2102	BBI2423	CEL2103
Sem 3	BBI2423		BBI2424	BBI2425
Sem 4	BBI2424		6 LAX points	6 LAX points
Sem 5	12 LAX points		Cel2103	BBI2426/Global language
Sem 6	CEL2103	Choose ONE : CEL2102/2105/2106/2107		6 LAX points
Sem 7	Choose ONE : CEL2105/2106/2107		6 LAX points	6 LAX points
Sem 8	6 LAX points		6 LAX points	-

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]

- BBI 2422 (Reading for Academic Purposes)
- BBI 2423 (Academic Interaction and Presentation)
- BBI 2424 (Academic Writing)
- BBI 2425 – for MUET Band 5 & 6 students only
- BBI 2426 – 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

- CEL 2102 (Effective Listening and Speaking)
- CEL 2103 (Writing Academic Texts)
- CEL 2105 (Spoken Communication for the Workplace)
- CEL 2106 (Communication for Professional Development)
- CEL 2107 (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

- BBI 2422: MUET Band 1 – 2/equivalent
- BBI 2423: CEL 2102 Level 2 or MUET Band 3 – 4/equivalent
- BBI 2424: Passed BBI 2423
- CEL 2103: Passed BBI 2424 or MUET Band 5 – 6/equivalent
- CEL 2102, 2105, 2106, 2107: No pre-requisite required

STRUKTUR KURIKULUM/ CURRICULUM STRUCTURE

Nama Program	: Bacelor Sains dan Teknologi Makanan/ Bachelor of Food Science and Technology
Jumlah Kredit Bergraduat	: 126 Jam Kredit/ Credit Hours
Tempoh Pengajian	: 8 Semester/ Semesters (4 Tahun/ Years)
Matlamat Program	: <ul style="list-style-type: none"> 1. menghasilkan graduan yang berpengetahuan, berketrampilan dan kompeten dalam bidang sains dan teknologi makanan selaras dengan kehendak industri makanan dan agensi berkaitan 2. menghasilkan graduan yang menunjukkan kualiti kepemimpinan yang baik di dalam sesebuah organisasi 3. menghasilkan graduan yang mampu menyelesaikan masalah bidang sains dan teknologi makanan secara inovatif, kreatif dan beretika melalui pendekatan yang mampan 4. menghasilkan graduan yang menyumbang kepada pembangunan keusahawanan sains dan teknologi makanan serta peka terhadap keperluan pembelajaran sepanjang hayat untuk pembangunan kerjaya yang progresif

Ringkasan Hasil Pembelajaran Program

Program	Pengetahuan	Kemahiran								
		Kemahiran Teknikal/Praktikal/ Psikomotor	Kemahiran Berfikir dan Pendekatan Sainstifik	Kemahiran Berkommunikasi	Kemahiran Sosial dan Bertanggungjawab	Professionalisme, Nilai, Sikap dan Etika	Pendidikan Sepanjang Hayat dan Pengurusan Informasi	Kemahiran Pengurusan dan Keusahawanan	Kemahiran Kepimpinan	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	
Bacelor Sains dan Teknologi Makanan	38	19	17	8	14	13	14	8	7	

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

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T	PRASYARAT/ PREREQUISITE
SKP2101	Kenegaraan Malaysia/ Malaysian Nationhood	3	3	0	Tiada/ None
SKP2203	Tamadun Islam dan Tamadun Asia/ Asian and Islamic Civilization	2	2	0	Tiada/ None
SKP2204	Hubungan Etnik /Ethnic Relation	2	2	0	Tiada/ None
PRT2008	Pertanian dan Manusia/ Agriculture and Man	2	2	0	Tiada/None

MGM3101	Prinsip Pengurusan/ <i>Principles of Management</i>	3	3	0	Tiada/ None
MGM3180	Asas Keusahawanan/ <i>Basic Entrepreneurship</i>	3	2	1	Tiada/ None
BBI2423	<i>Academic Interaction and Presentation</i>	3	2	1	CEL2102
BBI2424	<i>Academic Writing</i>	3	2	1	BBI2423
QK_XXXX	Kokurikulum I/ <i>Co-curriculum I</i>	1	0	1	Tiada/ None
QK_XXXX	Kokurikulum II/ <i>Co-curriculum II</i>	1	0	1	Tiada/ None

2. Kursus Teras/ Core Courses (72 Kredit/ Credits)

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T	PRASYARAT/ PREREQUISITE
CHM3201	Kimia Organik 1/ <i>Organic Chemistry I</i>	4	3	1	CHM2000
MTH3003	Statistik Bagi Sains Gunaan/ <i>Statistics for Applied Sciences</i>	4	3	1	Tiada/ None
FST3110	Biokimia Makanan/ <i>Food Biochemistry</i>	3	3	0	Tiada/ None
FST3114	Kimia Dan Analisis Komponen Makro Makanan/ <i>Chemistry And Analysis Of Food Macro-Components</i>	4	2	2	FST3110
FST3115	Kimia Dan Analisis Komponen Mikro Makanan/ <i>Chemistry And Analysis Of Food Micro-Components</i>	3	2	1	FST3114
FST3201	Mikrobiologi Makanan Asas/ <i>Basic Food Microbiology</i>	3	2	1	Tiada/ None
FST3202	Mikrobiologi Makanan/ <i>Food Microbiology</i>	3	2	1	FST3201
FST3302	Asas Pemprosesan Dan Pengawetan Makanan/ <i>Fundamentals of Food Processing and Preservation</i>	3	3	0	Tiada/ None
FST3401	Asas Kejuruteraan Makanan/ <i>Fundamentals of Food Engineering</i>	3	2	1	Tiada/ None
FST3404	Operasi Unit Pemprosesan Makanan I/ <i>Unit Operations in Food Processing I</i>	3	2	1	FST3401
FST3405	Operasi Unit Pemprosesan Makanan II/ <i>Unit Operations in Food Processing II</i>	3	2	1	FST3404
FST3601	Kebersihan Dan Sanitasi Makanan/ <i>Food Hygiene and Sanitation</i>	2	2	0	FST3202
FST3602	Makanan Halal/ <i>Halal Food</i>	2	2	0	FST3404
FST3701	Perubahan Nutrien Dalam Makanan/ <i>Nutrient Changes in Foods</i>	3	3	0	Tiada/ None
FST4828	Pembangunan Produk Makanan Baru/ <i>New Food Product Development</i>	3	1	2	FST4832, FST4408
FST4830	Teknologi Pemprosesan Hasilan Tumbuhan/ <i>Processing Technology of Plant Products</i>	3	2	1	FST3302

FST4831	Teknologi Pemprosesan Hasilan Haiwan/ <i>Processing Technology of Animal Products</i>	3	2	1	FST3302
FST4832	Penilaian Deria Makanan/ <i>Sensory Evaluation of Food</i>	2	1	1	MTH3003
FSM4901	Latihan Industri/ <i>Industrial Training</i>	12	0	12	Tiada/ None
FST4959	Disertasi Bacelor/ <i>Bachelor Dissertation</i>	6	0	6	Tiada/ None

3. Kursus Elektif/ *Elective courses (31 Kredit/ Credits)*

Pelajar dikehendaki memilih sekurang-kurangnya 31 kredit daripada mana-mana kursus yang ditawarkan di FSTM atau fakulti lain. Kursus yang dipilih pelajar hendaklah termasuk kursus Pengurusan Air dan Air Buangan Industri Makanan (FST4409), Perundangan Makanan (FST4609), sekurang-kurangnya satu kursus Teknologi Makanan yang tersenarai (seperti yang ditandakan dengan "@") dan satu kursus bahasa global

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T	PRASYARAT/ PREREQUISITE
FST4201	Kaedah Pantas Dalam Analisis Makanan/ <i>Rapid Methods in Food Analysis</i>	3	2	1	FST3202
FST4405	Sifat Kejuruteraan Makanan/ <i>Engineering Properties of Foods</i>	3	2	1	FST3401
FST4407	Pengurusan Operasi Loji Makanan/ <i>Operational Management of Food Plant</i>	3	3	0	FST3405
FST4408	Pembungkusan Makanan/ <i>Food Packaging</i>	3	2	1	FST3302 atau FST4826
FST4409	Pengurusan Air Dan Air Buangan Industri Makanan/ <i>Water and Waste Water Management in Food Industry</i>	2	2	0	FST4608
FST4410	Kejuruteraan Sisa Industri Makanan/ <i>Food Industry Waste Engineering</i>	2	2	0	Tiada/ None
FST4411	Reka Bentuk Loji Makanan/ <i>Food Plant Design</i>	3	3	0	FST3405
FST4505	Biopemprosesan Makanan/ <i>Food Bioprocessing</i>	3	3	0	Tiada/ None
FST4607	Toksikologi Makanan/ <i>Food Toxicology</i>	3	3	0	FST3115
FST4608	Keselamatan Makanan/ <i>Food Safety</i>	3	3	0	FST3202 dan FST3115
FST4609	Perundangan Makanan/ <i>Food Law</i>	2	2	0	FST4828
FST4610	Pengurusan Kualiti Makanan/ <i>Food Quality Management</i>	3	3	0	FST4608
FST4705	Makanan Fungsian/ <i>Functional Food</i>	3	3	0	FST3302
FST4833	Pengendalian Lepastuai Buah-buahan dan Sayur-sayuran/ <i>Postharvest Handling of Fruits and Vegetables @</i>	3	2	1	FST4830 atau FST4826
FST4834	Teknologi Minyak Dan Lemak/ <i>Technology of Oils and Fats @</i>	3	2	1	FST4830 dan FST4826

FST4835	Teknologi Bijirin dan Kekacang/ <i>Cereals and Legumes Technology</i> @	3	2	1	FST4830 dan FST4826
FST4836	Teknologi Tenuku/ <i>Dairy Technology</i> @	3	2	1	FST4831 dan FST4826
FST4837	Teknologi Minuman/ <i>Beverage Technology</i> @	3	2	1	FST4830 dan FST4826
FST4838	Teknologi Konfeksi Coklat dan Gula/ <i>Chocolate and Sugar Confectionery Technology</i> @	3	2	1	FST4830 dan FST4826
FST4839	Teknologi Hasilan Akuatik/ <i>Aquatic Product Technology</i> @	3	2	1	FST4831 dan FST4826
FST4840	Teknologi Daging/ <i>Meat Technology</i> @	3	2	1	FST4831 dan FST4826
BB_XXXX	Bahasa Global/ Global language	3	2	1	Tiada/ None

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

Nota Penting / Important Notes :

- Untuk maklumat lanjut berkenaan kursus kokurikulum, sila rujuk panduan Pusat Kokurikulum / *For more information regarding co-curriculum courses, please refer to the guide from the Centre for Co-curriculum.*
- Pelajar perlu melengkapkan **Pakej Pengalaman Bahasa Inggeris** seperti dalam jadual di bawah. Untuk butiran lanjut mengenai BBI, CEL dan LAX, sila rujuk panduan Pusat Pemajuan Kompetensi Bahasa / *Students need to complete the **English Language Experience (ELEX) Package** as shown in the table below. For more details on BBI, CEL and LAX, please refer to the guide from the Centre for the Advancement of Language Competence (CALC).*

MUET Band	TOEFL/IELTS Score	CIEP Level	Graduation Requirements for 4-year programmes
1 & 2	-	107	3 BBI + 3 CEL + 24 LAX points
3 & 4	TOEFL 500 - 599 IELTS 5.5 - 6.5	108 – 109	2 BBI + 2 CEL + 24 LAX points
5 & 6	TOEFL 600 - 677 IELTS 7.0 - 9.0	-	2 BBI + 1 CEL + 24 LAX points OR 1 BBI + 1 CEL + 24 LAX points (with global language)

**SKEMA PENGAJIAN BACELOR SAINS DAN TEKNOLOGI MAKANAN/ / STUDY SCHEME FOR
BACHELOR OF FOOD SCIENCE AND TECHNOLOGY**

TAHUN 1/ 1ST YEAR

SEMESTER 1/ 1ST SEMESTER

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
PRT2008	Pertanian dan Manusia/ Agriculture and Man	2	2	0
SKP2101	Kenegaraan Malaysia/ Malaysian Nationhood	3	3	0
SKP2203	Tamadun Islam dan Tamadun Asia/ Asian and Islamic Civilization	2	2	0
SKP2204	Hubungan Etnik /Ethnic Relation	2	2	0
MGM3101	Prinsip Pengurusan/ Principles of Management	3	3	0
QK_XXXX	Kokurikulum/ Co-curriculum	1	0	1
JUMLAH/ TOTAL		13	12	1

SEMESTER 2/ 2ND SEMESTER

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
BBI2423	Academic Interaction and Presentation	3	2	1
CHM3201	Kimia Organik 1/ Organic Chemistry 1	4	3	1
FST3110	Biokimia Makanan/ Food Biochemistry	3	3	0
FST3201	Mikrobiologi Makanan Asas/ Basic Food Microbiology	3	2	1
FST3401	Asas Kejuruteraan Makanan/ Fundamentals of Food Engineering	3	2	1
QK_XXXX	Kokurikulum/ Co-curriculum	1	0	1
JUMLAH/ TOTAL		17	12	5

TAHUN 2/ 2ND YEAR

SEMESTER 1/ 1ST SEMESTER

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
FST3114	Kimia Dan Analisis Komponen Makro Makanan/ Chemistry And Analysis of Food Macro-Components	4	2	2
MGM3180	Asas Keusahawanan/ Basic Entrepreneurship	3	2	1
FST3202	Mikrobiologi Makanan/ Food Microbiology	3	2	1

FST3302	Asas Pemprosesan dan Pengawetan Makanan/ <i>Fundamentals of Food Processing and Preservation</i>	3	3	0
FST3404	Operasi Unit Pemprosesan Makanan I/ <i>Unit Operations in Food Processing I</i>	3	2	1
BBI 2424	Academic Writing	3	2	1
JUMLAH/ TOTAL		19	13	6

SEMESTER 2/ 2ND SEMESTER

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
MTH3003	Statistik Bagi Sains Gunaan/ <i>Statistics for Applied Sciences</i>	4	3	1
FST3115	Kimia Dan Analisis Komponen Mikro Makanan/ <i>Chemistry And Analysis Of Food Micro-Components</i>	3	2	1
FST3405	Operasi Unit Pemprosesan Makanan II/ <i>Unit Operations in Food Processing II</i>	3	2	1
FST3601	Kebersihan Dan Sanitasi Makanan/ <i>Food Hygiene and Sanitation</i>	2	2	0
FST3602	Makanan Halal/ <i>Halal Food</i>	2	2	0
FST3701	Perubahan Nutrien Dalam Makanan/ <i>Nutrient Changes in Foods</i>	3	3	0
JUMLAH/ TOTAL		17	14	3

TAHUN 3/ 3RD YEAR

SEMESTER 1/ 1ST SEMESTER

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
FST4830	Teknologi Pemprosesan Hasilan Tumbuhan/ <i>Processing Technology of Plant Products</i>	3	2	1
FST4831	Teknologi Pemprosesan Hasilan Haiwan/ <i>Processing Technology of Animal Products</i>	3	2	1
FST4832	Penilaian Deria Makanan/ <i>Sensory Evaluation of Food</i>	2	1	1
	Elektif/ <i>Electives</i>	9		
JUMLAH/ TOTAL		17		

SEMESTER 2/ 2ND SEMESTER

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
FST4828	Pembangunan Produk Makanan Baru/ <i>New Food Product Development</i>	3	1	2
FST4959A	Disertasi Bacelor/ <i>Bachelor Dissertation</i>	3	0	3
	Elektif/ <i>Electives</i>	11		
	JUMLAH/ TOTAL	17		

TAHUN 4/ 4TH YEAR

SEMESTER 1/ 1ST SEMESTER

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
FST4959B	Disertasi Bacelor/ <i>Bachelor Dissertation</i>	3	0	3
	Elektif/ <i>Electives</i>	11		
	JUMLAH/ TOTAL	14		

SEMESTER 2/ 2ND SEMESTER

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
FSM4901	Latihan Industri/ <i>Industrial Training</i>	12	0	12
	JUMLAH/ TOTAL	12	0	12

STRUKTUR KURIKULUM/ CURRICULUM STRUCTURE

Nama Program : **Bachelor Sains (Pengajian Makanan)/ Bachelor of Science (Food Studies)**
Jumlah Kredit Bergraduat : **127 Jam Kredit/ Credit Hours + 2 Jam Kredit Kokurikulum**
Tempoh Pengajian : **8 Semester/ Semesters (4 Tahun/ Years)**

Matlamat Program :
1. melahirkan graduan profesional yang menyeluruh dari aspek sains dan teknologi, pengurusan dan pemasaran dalam bidang pengeluaran makanan
2. melahirkan graduan yang mempunyai kemahiran mengurus dan tahap profesionalisme, nilai, sikap dan tingkahlaku yang beretika untuk industri pembuatan makanan
3. melahirkan graduan yang berupaya menjalankan penyelidikan dan pembangunan dalam bidang pemprosesan dan pengeluaran makanan

Ringkasan Hasil Pembelajaran Program

Program	Pengetahuan									
		Kemahiran Teknikal/Praktikal/ Psikomotor	Kemahiran Berfikir dan Pendekatan Saintifik	Kemahiran Berkommunikasi	Kemahiran Sosial dan Bertanggungjawab	Professionalisme, Nilai, Sikap dan Etika	Pendidikan Sepanjang Hayat dan Pengurusan Informasi	Kemahiran Pengurusan dan Keusahawanan	Kemahiran Kepimpinan	
PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9		
Bachelor Sains (Pengajian Makanan) Pengkhususan Pengurusan Makanan	15	18	25	14	16	13	20	9	9	
Bachelor Sains (Pengajian Makanan) Pengkhususan Pemasaran Makanan	11	17	22	16	20	13	19	9	7	

1. Kursus Universiti/ University Courses (21 Kredit Tanpa Kokurikulum/ Credits Without Co-curriculum)

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T	PRASYARAT/ PREREQUISITE
SKP2101	Kenegaraan Malaysia/ Malaysian Nationhood	3	3	0	Tiada/ None
SKP2203	Tamadun Islam dan Tamadun Asia/ Asian and Islamic Civilization	2	2	0	Tiada/ None
SKP2204	Hubungan Etnik / Ethnic Relation	2	2	0	Tiada/ None
PRT2008	Pertanian dan Manusia/ Agriculture and Man	2	2	0	Tiada/None
BBI2423	Academic Interaction and Presentation	3	2	1	CEL2102
BBI2424	Academic Writing	3	2	1	BBI2423

BB_2401	Bahasa Asing I/ Foreign Language I	3	2	1	Tiada/ None
BB_2402	Bahasa Asing II/ Foreign Language II	3	2	1	Tiada/ None
QK_XXXX	Kokurikulum I/ Co-curriculum I	1	0	1	Tiada/ None
QK_XXXX	Kokurikulum II/ Co-curriculum II	1	0	1	Tiada/ None

2. Kursus Teras/ Core Courses (74 Kredit/ Credits)

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T	PRASYARAT/ PREREQUISITE
ACT2112	Perakaunan Pengenalan/ <i>Introductory Accounting</i>	4	3	1	Tiada/ None
CHM3201	Kimia Organik 1/ <i>Organic Chemistry I</i>	4	3	1	CHM2000
PHY2001	Fizik Am/ <i>General Physics</i>	4	3	1	Tiada/ None
ECN3100	Prinsip Ekonomi/ <i>Principles of Economics</i>	3	3	0	Tiada/ None
FSM3001	Pengenalan Industri Makanan/ <i>Introduction to Food Industry</i>	3	3	0	Tiada/ None
FSM3101	Kimia dan Fungsi Ramuan Makanan/ <i>Chemistry and Functionality of Food Ingredients</i>	3	2	1	Tiada/ None
FSM4801	Seminar/ <i>Seminar</i>	1	0	1	Tiada/ None
FSM4999A	Projek Ilmiah Tahun Akhir/ <i>Final Year Project I</i>	3	0	3	Tiada/ None
FSM4999B	Projek Ilmiah Tahun Akhir/ <i>Final Year Project II</i>	3	0	3	FSM4999A
FST3113	Perubahan Pemakanan Dalam Makanan/ <i>Nutritional Changes in Foods</i>	3	3	0	Tiada/ None
FST3201	Mikrobiologi Makanan Asas/ <i>Basic Food Microbiology</i>	3	2	1	Tiada/ None
FST3401	Asas Kejuruteraan Makanan/ <i>Fundamentals of Food Engineering</i>	3	2	1	PHY2001
FST4823	Kebersihan Makanan dan Sanitasi/ <i>Food Hygiene and Sanitation</i>	3	3	0	FST3201
FST4824	Pengurusan Kualiti Makanan/ <i>Food Quality Management</i>	3	3	0	Tiada/ None
FST4825	Perundangan Makanan/ <i>Food Law</i>	2	2	0	BSTM : FST4831, BS(PMK) : FST4826
FST4826	Pemprosesan hasilan tumbuhan dan haiwan/ <i>Processing of Plant and Animal Products</i>	4	3	1	FSM3101
FSM4901	Latihan Industri/ <i>Industrial Training</i>	12	0	12	FST4999
MGM3101	Prinsip Pengurusan/ <i>Principles of Management</i>	3	3	0	Tiada/ None
MGM3113	Gelagat Organisasi/ <i>Organizational</i>	3	3	0	MGM3101

<i>Behavior</i>					
MGM3180	Asas Keusahawanan/ <i>Basic Entrepreneurship</i>	3	2	1	Tiada/ None
MTH3003	Statistik Bagi Sains Gunaan/ <i>Statistics for Applied Sciences</i>	4	3	1	Tiada/ None

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

i. Opsyen Pengurusan Makanan/ *Food Management*

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T	PRASYARAT/ PREREQUISITE
ACT2131	Perakaunan Kos dan Pengurusan/ <i>Cost and Management Accounting</i>	3	3	0	ACT2112
ACT3211	Pengurusan Kewangan/ <i>Financial Management</i>	3	3	0	ACT3112/ ACT3113
FSM3601	Pengurusan Operasi dalam Industri Makanan/ <i>Food Industry Operations Management</i>	3	3	0	FSM3001 dan MTH3003
FSM4401	Sistem Maklumat Pengurusan dalam Industri Makanan/ <i>Information System in Food Industry</i>	3	2	1	Tiada/ None
FSM4502	Pemasaran dan Penjualan dalam Industri Makanan/ <i>Marketing and Sales in Food Industry</i>	3	3	0	Tiada/ None
FSM4601	Pengurusan Strategik dalam Industri Makanan/ <i>Strategic Management in Food Industry</i>	3	3	0	ACT3211 dan FSM4502
FSM4658	Isu Semasa dalam Perniagaan Makanan/ <i>Current Issue in Food Business</i>	3	3	0	Tiada/ None
FST3304	Operasi Unit Pemprosesan Makanan I/ <i>Unit Operations in Food Processing I</i>	4	3	1	FST3401
FST3305	Operasi Unit Pemprosesan Makanan II/ <i>Unit Operation in Food Processing II</i>	3	2	1	FST3401, FST3304
FST4001	Makanan Halal/ <i>Halal Food</i>	2	2	0	Tiada/ None
FST4406	Rekabentuk Proses dan Loji Makanan/ <i>Food Process and Plant Design</i>	4	4	0	FST3304 dan FST3305
FST4914	Kejuruteraan Sisa Industri Makanan/ <i>Food Industry Waste Engineering</i>	2	2	0	Tiada/ None
MGM4284	Pengurusan Promosi/ <i>Promotion Management</i>	3	3	0	MGM3211
PPT4202	Perancangan dan Pengurusan Projek Perniagaantani/ <i>Agribusiness Project Planning and Management</i>	3	3	0	EPT3100/ ECN3100/ EPT3102/ EPT3110
PPT4701	Keusahawanan Perniagaantani/ <i>Agribisnes Enterpreneurship</i>	3	2	1	Tiada/ None

ii. Opsyen Pemasaran Makanan/ *Food Marketing*

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T	PRASYARAT/ PREREQUISITE
FSM4502	Pemasaran dan Penjualan dalam Industri Makanan/ <i>Marketing and Sales in Food Industry</i>	3	3	0	Tiada/ None
FST3304	Operasi Unit Pemprosesan Makanan I/ <i>Unit Operations in Food Processing I</i>	4	3	1	FST3401
FST3305	Operasi Unit Pemprosesan Makanan II/ <i>Unit Operation in Food Processing II</i>	3	2	1	FST3401, FST3304
FST4001	Makanan Halal/ <i>Halal Food</i>	2	2	0	Tiada/ None
FST4504	Mikrobiologi Industri Makanan/ <i>Industrial Food Microbiology</i>	4	3	1	FST3201
FST4829	Penilaian Deria Makanan/ <i>Sensory Evaluation of Food</i>	3	2	1	MTH3003
MGM3211	Prinsip Pemasaran/ <i>Principles of Marketing</i>	3	3	0	MGM2111/ MGM3101
MGM3244	Gelagat Pengguna/ <i>Consumer Behavior</i>	3	3	0	MGM3211
MGM4204	Pemasaran Perkhidmatan/ <i>Services Marketing</i>	3	3	0	MGM3211
MGM4219	Pengurusan dan Strategi Pemasaran/ <i>Marketing Strategy & Management</i>	3	3	0	MGM3211
MGM4224	Pemasaran Langsung/ <i>Direct Marketing</i>	3	3	0	MGM3211
MGM4264	Penyelidikan Pemasaran/ <i>Marketing Research</i>	3	3	0	MGM3211 dan MGM3162
MGM4273	Pemasaran Antarabangsa/ <i>International Marketing</i>	3	3	0	MGM3211
MGM4284	Pengurusan Promosi/ <i>Promotion Management</i>	3	3	0	MGM3211

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

Nota Penting / Important Notes :

1. Pelajar diwajibkan memilih **2 kredit** daripada **kursus kokurikulum** yang ditawarkan oleh universiti. Untuk maklumat lanjut berkenaan kursus kokurikulum, sila rujuk panduan Pusat Kokurikulum / *It is compulsory for students to take 2 credits of co-curriculum courses offered by the university. For more information regarding co-curriculum courses, please refer to the guide from the Centre for Co-curriculum.*
2. Pelajar perlu melengkapkan **Pakej Pengalaman Bahasa Inggeris** seperti dalam jadual di bawah. Untuk butiran lanjut mengenai BBI, CEL dan LAX, sila rujuk panduan Pusat Kemajuan Kompetensi Bahasa / *Students need to complete the English Language Experience (ELEX) Package as shown in the table below. For more details on BBI, CEL and LAX, please refer to the guide from the Centre for the Advancement of Language Competence (CALC).*

MUET Band	TOEFL/IELTS Score	CIEP Level	Graduation Requirements for 4-year programmes
1 & 2	-	107	3 BBI + 3 CEL + 24 LAX points
3 & 4	TOEFL 500 - 599 IELTS 5.5 - 6.5	108 – 109	2 BBI + 2 CEL + 24 LAX points

5 & 6	TOEFL 600 - 677 IELTS 7.0 - 9.0	-	2 BBI + 1 CEL + 24 LAX points OR 1 BBI + 1 CEL + 24 LAX points (with global language)
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**SKEMA PENGAJIAN BACELOR SAINS (PENGAJIAN MAKANAN)/ STUDY SCHEME FOR
BACHELOR OF SCIENCE (FOOD STUDIES)**

TAHUN 1/ 1ST YEAR

SEMESTER 1/ 1ST SEMESTER

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
SKP2101	Kenegaraan Malaysia/ <i>Malaysian Nationhood</i>	3	3	0
PHY 2001	Fizik Am/ <i>General Physics</i>	4	3	1
FSM 3001	Pengenalan Industri Makanan/ <i>Introduction to Food Industry</i>	3	3	0
MGM 3101	Prinsip Pengurusan/ <i>Principles of Management</i>	3	3	0
ACT 2112	Perakaunan Pengenalan/ <i>Introductory Accounting</i>	4	3	1
QK_XXXX	Kokurikulum I/ Co-curriculum I	1	0	1
JUMLAH/ TOTAL		18	15	3

SEMESTER 2/ 2ND SEMESTER

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
BBI2423	Academic Interaction and Presentation	3	2	1
CHM 3201	Kimia Organik 1/ <i>Organic Chemistry I</i>	4	3	1
FSM3101	Kimia dan Fungsi Ramuan Makanan/ <i>Chemistry and Functionality of Food Ingredients</i>	3	2	1
ECN3100	Prinsip Ekonomi/ <i>Principles of Economics</i>	3	3	0
PRT2008	Pertanian dan Manusia/ <i>Agriculture and Man</i>	2	2	0
SKP2204	Hubungan Etnik / <i>Ethnic Relation</i>	2	2	0
QK_XXXX	Kokurikulum II/ Co-curriculum II	1	0	1
JUMLAH/ TOTAL		18	14	4

TAHUN 2/ 2ND YEAR

SEMESTER 1/ 1ST SEMESTER

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
BBI2424	Academic Writing	3	2	1
FST3113	Perubahan Pemakanan Dalam Makanan/ <i>Nutritional Changes in Foods</i>	3	3	0

FST3401	Asas Kejuruteraan Makanan/ <i>Fundamentals of Food Engineering</i>	3	2	1
SKP2203	Tamadun Islam dan Tamadun Asia/ <i>Asian and Islamic Civilization</i>	2	2	0
	Elektif/ <i>Electives</i>	6		
	JUMLAH/ TOTAL	17		

SEMESTER 2/ 2ND SEMESTER

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
MTH3003	Statistik Bagi Sains Gunaan/ <i>Statistics for Applied Sciences</i>	4	3	1
FST3201	Mikrobiologi Makanan Asas/ <i>Basic Food Microbiology</i>	3	2	1
MGM3113	Gelagat Organisasi/ <i>Organizational Behavior</i>	3	3	0
MGM3180	Asas Keusahawanan/ <i>Basic Entrepreneurship</i>	3	2	1
	Elektif/ <i>Electives</i>	3		
	JUMLAH/ TOTAL	16		

TAHUN 3/ 3RD YEAR

SEMESTER 1/ 1ST SEMESTER

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
BB_2401	Bahasa Asing I/ <i>Foreign Language I</i>	3	2	1
FST4823	Kebersihan Makanan dan Sanitasi/ <i>Food Hygiene and Sanitation</i>	3	3	0
FST4826	Pemprosesan hasilan tumbuhan dan haiwan/ <i>Processing of Plant and Animal Products</i>	4	3	1
	Elektif/ <i>Electives</i>	6		
	JUMLAH/ TOTAL	16		

SEMESTER 2/ 2ND SEMESTER

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
BB_2402	Bahasa Asing II/ <i>Foreign Language II</i>	3	2	1
FST4824	Pengurusan Kualiti Makanan/ <i>Food Quality Management</i>	3	3	0
FST4825	Perundangan Makanan/ <i>Food Law</i>	2	2	0

FSM4999A	Projek Ilmiah Tahun Akhir I/ <i>Final Year Project I</i>	3	0	3
	Elektif/ <i>Electives</i>	6		
	JUMLAH/ TOTAL	17		

TAHUN 4/ 4TH YEAR

SEMESTER 1/ 1ST SEMESTER

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
FSM4801	Seminar/ <i>Seminar</i>	1	0	1
FSM4999B	Projek Ilmiah Tahun Akhir II/ <i>Final Year Project II</i>	3	0	3
	Elektif/ <i>Electives</i>	11		
	JUMLAH/ TOTAL	15		

SEMESTER 2/ 2ND SEMESTER

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
FSM4901	Latihan Industri/ <i>Industrial Training</i>	12	0	12
	JUMLAH/ TOTAL	12	0	12

STRUKTUR KURIKULUM/ CURRICULUM STRUCTURE

Nama Program	: Bachelor Sains (Pengurusan Perkhidmatan Makanan)/ Bachelor of Science (Food Service Management)
Jumlah Kredit Bergraduat	: 126 Jam Kredit/ Credit Hours + 2 Jam Kredit Kokurikulum
Tempoh Pengajian	: 8 Semester/ Semesters (4 Tahun/ Years)
Matlamat Program	: <ol style="list-style-type: none"> 1. melahirkan graduan profesional yang menyeluruh meliputi aspek sains dan teknologi, kulinari dan gastronomi, layanan dan keusahawanan dalam sektor perkhidmatan makanan 2. melahirkan graduan dengan kemahiran mengurus dan mempunyai tahap profesionalisma, nilai, sikap dan tingkah laku yang beretika dalam industri perkhidmatan makanan 3. melahirkan graduan yang berupaya menjalankan penyelidikan dan pembangunan dalam bidang perkhidmatan makanan

Ringkasan Hasil Pembelajaran Program

Program	Pengetahuan	Kemahiran Teknikal/Praktikal/ Psikomotor	Kemahiran Berfikir dan Pendekatan Saintifik	Kemahiran Berkommunikasi	Kemahiran Sosial dan Bertanggungjawab	Professionalisme, Nilai, Sikap dan Etika	Pendidikan Sepanjang Hayat dan Pengurusan Informasi	Kemahiran Pengurusan dan Keusahawanan	Kemahiran Kepimpinan
Bachelor Sains (Pengurusan Perkhidmatan Makanan)	16	25	40	30	11	21	28	15	14

1. Kursus Universiti/ University Courses (21 Kredit Tanpa Kokurikulum/ Credits Without Co-curriculum)

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T	PRASYARAT/ PREREQUISITE
BBI2423	Academic Interaction and Presentation	3	2	1	CEL2102
BBI2424	Academic Writing	3	2	1	BBI2423
BBI2412	Writing for Academic Purposes	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
SKP2203	Tamadun Islam dan Tamadun Asia/ Asian and Islamic Civilization	2	2	0	Tiada/ None
SKP2204	Hubungan Etnik /Ethnic Relation	2	2	0	Tiada/ None

MGM3180	Asas Keusahawanan/ <i>Basic Entrepreneurship</i>	3	2	1	Tiada/ None
QK_XXXX	Kokurikulum I/ <i>Co-curriculum I</i>	1	0	1	Tiada/ None
QK_XXXX	Kokurikulum II/ <i>Co-curriculum II</i>	1	0	1	Tiada/ None

2. Kursus Teras/ *Core Courses (72 Kredit/ Credits)*

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T	PRASYARAT/ PREREQUISITE
MTH3003	Statistik Bagi Sains Gunaan/ <i>Statistics for Applied Sciences</i>	4	3	1	Tiada/ None
FST3301	Prinsip Pemprosesan dan Pengawetan Makanan/ <i>Principles of Food Processing and Preservation</i>	4	3	1	Tiada/ None
FSM3001	Pengenalan Industri Makanan/ <i>Introduction to Food Industry</i>	3	3	0	Tiada/ None
FSM3203	Kefungsian Ramuan Makanan/ <i>Functionality of Food Ingredients</i>	3	2	1	Tiada/ None
FSM3204	Pemakanan dalam Perkhidmatan Makanan/ <i>Nutrition in Foodservice</i>	3	2	1	Tiada/ None
FSM3205	Mikrobiologi Dalam Perkhidmatan Makanan / <i>Microbiology In Foodservice</i>)	3	2	1	Tiada/ None
FSM3302	Teori Asas Penyediaan Makanan / <i>Basic Theory Of Food Preparation</i>)	3	3	0	Tiada/ None
FSM3303	Amali Asas Penyediaan Makanan / <i>Fundamental Laboratory For Food Preparation</i>	2	0	2	Tiada/ None
FSM3401	Khidmat Layanan Restoran / <i>Restaurant Services</i>	2	0	2	Tiada/ None
FSM3501	Pembangunan Menu / <i>Menu Development</i>	3	3	0	FSM3302
FSM3602	Sumber Manusia Dalam Perkhidmatan Makanan/ <i>Human Resource In Foodservice</i>	3	3	0	Tiada/ None
FSM4101	Kaedah Penyelidikan Dalam Perkhidmatan Makanan/ <i>Research Methods In Foodservice</i>	3	2	1	MTH3003
FSM4206	Kebersihan Dan Sanitasi Dalam Perkhidmatan Makanan <i>Hygiene And Sanitation In Foodservice</i>	2	2	0	Tiada/ None
FSM4304	Penyediaan Makanan Lanjutan / <i>Advanced Food Preparation</i>	3	1	2	FSM3303 Dan FSM3401
FSM4503	Sistem Maklumat Dalam Perkhidmatan Makanan/ <i>Information System In Foodservice</i>	3	2	1	FSM3501
FSM4504	Reka Bentuk Dan Susunatur Prasarana Perkhidmatan Makanan / <i>Equipment Layout And Design For Foodservice Facilities</i>	3	2	1	FSM3205, FSM3401 dan FSM3501
FSM4603	Pemasaran Dan Penjualan Dalam Perkhidmatan Makanan/ <i>Marketing And Sales In Foodservice</i>	3	3	0	FSM3501

FSM4803	Perundangan Industri Perkhidmatan Makanan/ <i>Foodservice Industrial Law</i>	3	3	0	Tiada/ None
FSM4901	Latihan Industri/ <i>Industrial Training</i>	12	0	12	Tiada
FSM4977	Seminar/Seminar	1	0	1	Tiada/ None
FSM4999	Projek Ilmiah Tahun Akhir/ <i>Final Year Project</i>	6	0	6	Tiada/ None

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

Elektif Kumpulan Bahasa (minima = 6 Kredit)					
KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T	PRASYARAT/ PREREQUISITE
BB_2401	Bahasa Asing I/ <i>Foreign Language I</i>	3	2	1	Tiada/ None
BB_2402	Bahasa Asing II/ <i>Foreign Language II</i>	3	2	1	Tiada/ None
BB_2403	Bahasa Asing III/ <i>Foreign Language III</i>	3	2	1	Tiada/ None
Elektif Kumpulan Kuantitatif (Minima = 12 Kredit)					
KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T	PRASYARAT/ PREREQUISITE
ECN3100	Prinsip Ekonomi/ <i>Principles Of Economics</i>	3	3	0	Tiada/ None
ECN3101	Mikroekonomi/ <i>Microeconomics</i>	3	3	0	ECN3100
ECN3102	Makroekonomi/ <i>Macroeconomics</i>	3	3	0	ECN3100
ACT2112	Perakaunan Pengenalan/ <i>Introductory Accounting</i>	4	3	1	Tiada/ None
ACT3211	Pengurusan Kewangan/ <i>Financial Management</i>	3	3	0	ACT3112/ ACT3113
FSM3604	Pengurusan Dan Kawalan Kos Perkhidmatan Makanan/ <i>Foodservice Management And Cost Control</i>	3	3	0	FSM3501
FSM3605	Pembelian Berkuantiti Dalam Perkhidmatan Makanan/ <i>Procurement In Foodservice</i>	3	3	0	FSM3501
FSM4606	Pengurusan Operasi Perkhidmatan Makanan/ <i>Foodservice Operations Management</i>	3	3	0	MTH3003
FSM4701	Sistem Operasi Perkhidmatan Makanan / <i>Foodservice Operational System</i>	3	3	0	Tiada/ None
Elektif Kumpulan Profesional (Minima = 15 Kredit)					
KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T	PRASYARAT/ PREREQUISITE
FSM4207	Makanan Kajian Dalam Perkhidmatan Makanan/ <i>Experimental Food In Foodservice</i>	3	1	2	FSM3203, FSM3303 dan FST3301
FSM4305	Kuisin Barat/ <i>Western Cuisine</i>	3	1	2	FSM3303

FSM4306	Kuisin Asia/Asian Cuisine	3	1	2	FSM3303
FSM4607	Pengurusan Strategik Perkhidmatan Makanan/ <i>Foodservice Strategic Management</i>	3	3	0	Tiada/ None
FSM4702	Pengurusan Makanan Dan Minuman / <i>Food And Beverage Management</i>	3	3	0	FSM3604, FSM4504 dan FSM4603
FSM4703	Pengurusan Institusi / <i>Institutional Management</i>	3	3	0	FSM3204, FSM3501 dan FSM4701
FSM4704	Pengurusan Minuman Dan Bar/ <i>Beverage And Bar Management</i>	3	3	0	FSM3501 dan FSM3604
FSM4804	Kontrak Dan Francais Dalam Perkhidmatan Makanan/ <i>Contract And Franchise In Foodservice</i>	3	3	0	Tiada/ None
FST4001	Makanan Halal/ <i>Halal Food</i>	2	2	0	Tiada/ None
MGM3113	Gelagat Organisasi/ <i>Organizational Behavior</i>	3	3	0	MGM3101
MGM4154	Pengurusan Perniagaan Antarabangsa/ <i>International Business Management</i>	3	3	0	MGM3211 dan ACT3211
MGM4183	Keusahawanan/ <i>Entrepreneurship</i>	3	3	0	MGM3101
HPR4100	Pengurusan Hotel dan Pusat Peranginan/ <i>Hotel And Resort Management</i>	3	3	0	HPR3100
HPR4314	Pengurusan Acara, Konvensyen Dan Pameran/ <i>Event, Convention And Exhibition Management</i>	3	3	0	HPR3100
DTK3000	Kaunseling Pemakanan/ <i>Nutrition Counseling</i>	3	2	1	KOH3432
DTK3200	Pemakanan Klinikal/ <i>Clinical Nutrition</i>	4	3	1	SBP3202
DTK3201	Diet Terapi I/ <i>Therapeutic Diet I</i>	3	3	0	DTK3200
KOH3432	Kemahiran Komunikasi Interpersonal/ <i>Interpersonal Communication Skill</i>	3	2	1	Tiada/ None
SBP3202	Biokimia Klinikal/ <i>Clinical Biochemistry</i>	3	2	1	Persetujuan Penyelaras Kursus

Nota Penting / Important Notes :

1. Pelajar diwajibkan memilih **2 kredit** daripada **kursus kokurikulum** yang ditawarkan oleh universiti. Untuk maklumat lanjut berkenaan kursus kokurikulum, sila rujuk panduan Pusat Kokurikulum / *It is compulsory for students to take 2 credits of co-curriculum courses offered by the university. For more information regarding co-curriculum courses, please refer to the guide from the Centre for Co-curriculum.*
2. Pelajar perlu melengkapkan **Pakej Pengalaman Bahasa Inggeris** seperti dalam jadual di bawah. Untuk butiran lanjut mengenai BBI, CEL dan LAX, sila rujuk panduan Pusat Kemajuan Kompetensi Bahasa / *Students need to complete the English Language Experience (ELEX) Package as shown in the table*

below. For more details on BBI, CEL and LAX, please refer to the guide from the Centre for the Advancement of Language Competence (CALC).

MUET Band	TOEFL/IELTS Score	CIEP Level	Graduation Requirements for 4-year programmes
1 & 2	-	107	3 BBI + 3 CEL + 24 LAX points
3 & 4	TOEFL 500 - 599 IELTS 5.5 - 6.5	108 – 109	2 BBI + 2 CEL + 24 LAX points
5 & 6	TOEFL 600 - 677 IELTS 7.0 - 9.0	-	2 BBI + 1 CEL + 24 LAX points OR 1 BBI + 1 CEL + 24 LAX points (with global language)

SKEMA PENGAJIAN BACELOR SAINS (PENGURUSAN PERKHIDMATAN MAKANAN)/ STUDY SCHEME FOR BACHELOR OF SCIENCE (FOOD SERVICE MANAGEMENT)

TAHUN 1/ 1ST YEAR

SEMESTER 1/ 1ST SEMESTER

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
SKP2204	Hubungan Etnik /Ethnic Relation	2	2	0
MGM3180	Asas Keusahawanan/Basic <i>Entrepreneurship</i>	3	2	1
FSM3001	Pengenalan Industri Makanan/ <i>Introduction to Food Industry</i>	3	3	0
FSM3205	Mikrobiologi Dalam Perkhidmatan Makanan <i>/Microbiology In Foodservice</i>	3	2	1
FSM3302	Teori Asas Penyediaan Makanan <i>/Basic Theory Of Food Preparation</i>	3	3	0
FSM3303	Amali Asas Penyediaan Makanan <i>/Fundamental Laboratory For Food Preparation</i>	2	0	2
QK_XXXX	Kokurikulum I/ Co-curriculum I	1	0	1
JUMLAH/ TOTAL		17	12	5

SEMESTER 2/ 2ND SEMESTER

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
BBI2423	Academic Interaction and Presentation	3	2	1
FSM3203	Kefungsian Ramuan Makanan <i>/Functionality Of Food Ingredients</i>	3	2	1
FSM3204	Pemakanan Dalam Perkhidmatan Makanan <i>/Nutrition In Foodservice</i>	3	2	1
FSM3401	Khidmat Layanan Restoran/ <i>Restaurant Services</i>	2	0	2
SKP2203	Tamadun Islam dan Tamadun Asia/ <i>Asian and Islamic Civilization</i>	2	2	0
SKP2101	Kenegaraan Malaysia/ <i>Malaysian Nationhood</i>	3	3	0
QK_XXXX	Kokurikulum II/ Co-curriculum II	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/T
BBI2424	Academic Writing	3	2	1
FST3301	Prinsip Pemprosesan Dan Pengawetan	4	3	1

	Makanan <i>/Principles Of Food Processing And Preservation</i>			
FSM3501	Pembangunan Menu/ <i>Menu Development</i>	3	3	0
FSM3602	Sumber Manusia Dalam Perkhidmatan Makanan/ <i>Human Resource In Foodservice</i>	3	3	0
	Elektif/ <i>Electives</i>	6		
	JUMLAH/ TOTAL	19	11	2

SEMESTER 2/ 2ND SEMESTER

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
PRT2008	Pertanian dan Manusia/ <i>Agriculture and Man</i>	2	2	0
FSM4206	Kebersihan Dan Sanitasi Dalam Perkhidmatan Makanan/ <i>Hygiene And Sanitation In Foodservice</i>	2	2	0
FSM4503	Sistem Maklumat Dalam Perkhidmatan Makanan/ <i>Information System In Foodservice</i>	3	2	1
FSM4504	Reka Bentuk Dan Susunatur Prasarana Perkhidmatan Makanan / <i>Equipment Layout And Design For Foodservice Facilities</i>	3	2	1
	Elektif/ <i>Electives</i>	6		
	JUMLAH/ TOTAL	16	8	2

TAHUN 3/ 3RD YEAR

SEMESTER 1/ 1ST SEMESTER

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
MTH3003	Statistik Bagi Sains Gunaan/ <i>Statistics for Applied Sciences</i>	4	3	1
FSM4603	Pemasaran Dan Penjualan Dalam Perkhidmatan Makanan / <i>Marketing And Sales In Foodservice</i>	3	3	0
BBI2412	Writing for Academic Purposes	3	2	1
	Elektif/ <i>Electives</i>	6		
	JUMLAH/ TOTAL	16	8	2

SEMESTER 2/ 2ND SEMESTER

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
FSM4901	Latihan Industri/ <i>Industrial Training</i>	12	0	12
	JUMLAH/ TOTAL	12	0	12

TAHUN 4/ 4TH YEAR

SEMESTER 1/ 1ST SEMESTER

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
FSM4101	Kaedah Penyelidikan Dalam Perkhidmatan Makanan/ <i>Research Methods In Foodservice</i>	3	2	1
FSM4999A	Projek Ilmiah Tahun Akhir I/ <i>Final Year Project I</i>	3	0	3
FSM4304	Penyediaan Makanan Lanjutan / <i>Advanced Food Preparation</i>	3	1	2
	Elektif/ <i>Electives</i>	6		
	JUMLAH/ TOTAL	15	3	6

SEMESTER 2/ 2ND SEMESTER

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
FSM4999B	Projek Ilmiah Tahun Akhir II/ <i>Final Year Project II</i>	3	0	3
FSM4977	Seminar/ <i>Seminar</i>	1	0	1
FSM4803	Perundangan Industri Perkhidmatan Makanan/ <i>Foodservice Industrial Law</i>	3	3	0
	Elektif/ <i>Electives</i>	9		
	JUMLAH/ TOTAL	16	3	4

SINOPSIS KURSUS/ COURSE SYNOPSIS

Jabatan Sains Makanan/ Department of Food Science

FST3110 Biokimia Makanan/ *Food Biochemistry* 3 (3 + 0)

Prasyarat : Tiada

Kursus ini merangkumi komponen-komponen utama dan proses biokimia yang berlaku dalam sistem hidupan. Kursus ini juga meliputi air dan sistem penimbang; asid amino dan protein; pemangkin berenzim; bioenergetiks; membran biologi; laluan metabolismik biomolekul utama; fotosintesis, dan proses transkripsi dan translasi.

This course covers the major components and biochemical processes occurring in living system. This course also covers water and buffer systems; amino acids and proteins; enzyme catalysis; bioenergetics; biological membranes; metabolic pathways of major biomolecules; photosynthesis, transcription and translation processes.

FST3113 Perubahan Pemakanan Dalam Makanan/ *Nutritional Changes in Foods* 3 (3 + 0)

Prasyarat : Tiada

Kursus ini meliputi sumbangan dan kepentingan nutrien ke atas kesihatan, pemakanan untuk golongan tertentu dan penilaian status pemakanan. Perubahan kualiti nutrien semasa pemprosesan dan penstoran makanan turut dibincangkan.

This course covers the contribution and significance of nutrients in health, nutrition for special groups and nutritional status assessment. Nutritional changes that occur during processing and storage of food will also be discussed.

FST3114 Kimia Dan Analisis Komponen Makro Makanan/ *Chemistry and Analysis Of Food Macro-Components* 4 (2 + 2)

Prasyarat : FST3110

Kursus ini merangkumi sifat fiziko-kimia komponen makro makanan iaitu air, karbohidrat, serat diet, protein dan lipid. Kursus ini juga merangkum perkaitan di antara sifat fiziko-kimia dan kefungsian komponen makro berkenaan dalam makanan. Ia termasuk aplikasi kaedah utama yang digunakan dalam analisis komponen makro makanan.

This course covers the physico-chemical properties of macro-components of food namely water, carbohydrates, dietary fibre, proteins and lipids. This course also covers the relationship between the physico-chemical and their functional properties. It includes application of the main methods in the analysis of food macro-components.

FST3115 Kimia Dan Analisis Komponen Mikro Makanan/ *Chemistry And Analysis Of Food Micro-Components* 3 (2 + 1)

Prasyarat : FST3114

Kursus ini meliputi sifat fiziko-kimia komponen mikro makanan iaitu vitamin, mineral, pigmen haiwan dan tumbuhan, perisa semulajadi, enzim, bahan toksik semulajadi, bahan cemar, sebatian bioaktif dan aditif makanan. Kursus ini juga merangkum perkaitan di antara sifat fiziko-kimia dan kefungsian komponen mikro berkenaan dalam makanan. Ia termasuk aplikasi kaedah utama yang digunakan dalam analisis komponen mikro makanan.

This course covers the physico-chemical properties of micro-components of food namely vitamins, minerals, animal and plant pigments, natural flavours, enzymes, natural toxicants, contaminants, bioactive compounds and food additives. This course also covers the relationship between the physico-chemical and their functional properties in foods. It includes the application of the main

methods in the analysis of food micro-components.

FST3201 Mikrobiologi Makanan Asas/ *Basic Food Microbiology* 3 (2 + 1)

Prasyarat : Tiada

Kursus ini meliputi pengenalan kepada mikrobiologi dan teknik asas yang digunakan di makmal, sifat mikro-organisma dan pengelasan, struktur dan fungsi sel prokariot dan eukariot, pengkulturan pemeliharaan bakteria, pembiakan dan tumbesaran, metabolisma dan biosintesis, kawalan tumbesaran mikrob, pemusnahan mikroorganisma, mutasi, kejuruteraan genetik, tindakbalas rentanan dan imun, sifat yis, fungi dan virus bawaan makanan.

This course covers introduction to microbiology and basic techniques used in the laboratory, characteristics of microorganisms and classification, structures and functions of prokaryotes and eukaryotes, cultivation and maintenance of cultures, reproduction and growth, metabolism and biosynthesis, control of microbial growth, sterilization and disinfection, mutation, genetic engineering, immune and allergic responses, and characteristics of foodborne yeasts, fungi and viruses.

FST3202 Mikrobiologi Makanan/ *Food Microbiology* 3 (2 + 1)

Prasyarat : FST3201

Kursus ini meliputi peranan dan kepentingan mikroorganisma dalam makanan dan persekitaran, faktor yang mempengaruhi tumbesaran mikroorganisma dalam makanan, kesan pemprosesan dan pengawetan makanan ke atas tumbesaran dan kemandirian mikroorganisma, aktiviti mikroorganisma yang menyebabkan keracunan dan kerosakan makanan (mikroorganisma perosak), kualiti makanan dan air dari sudut mikrobiologi, organisma penunjuk, probiotik dan mikroorganisma bermanfaat.

This course covers the role and significance of microorganisms in foods and environment, factors affecting their growth in foods, effects of food processing and preservation techniques on the growth and survival of microorganisms, microbial activities as a causal agent for food poisoning and spoilage, microbial quality of food and water, indicator organisms, probiotics and beneficial microorganisms.

FST3601 Kebersihan Dan Sanitasi Makanan/ *Food Hygiene and Sanitation* 2 (2 + 0)

Prasyarat : FST3202

Kursus ini merangkum prinsip kebersihan dan sanitasi dalam industri makanan. Kursus ini juga merangkum sistem kebersihan dan sanitasi yang meliputi pelbagai aspek sanitasi seperti jangkitan, kebersihan, kaedah penentuan kebersihan, unsur sanitasi, kualiti air, kotoran, teknologi permukaan, teknologi pembersihan, rekabentuk bersih dan konsep Cleaning In-Place (CIP).

This course covers principles of hygiene and sanitation in food industries. This course also covers the various aspects of sanitation such as infection, hygiene, methods to determine hygiene, elements of sanitation, water quality, soils, surface technology, cleaning technology, hygienic design and Cleaning In-Place (CIP) concept.

FST3701 Perubahan Nutrien Dalam Makanan/ *Nutrient Changes in Foods* 3 (3 + 0)

Prasyarat : Tiada

Kursus ini meliputi sumbangan dan kepentingan nutrien ke atas kesihatan, Syor Diet Harian (*Recommended Dietary Allowance; RDA*), pemakanan untuk golongan tertentu dan penilaian status pemakanan. Kursus ini juga meliputi penekanan ke atas perubahan kualiti nutrien semasa pemprosesan dan penstoran makanan.

This course covers the contribution and significance of nutrients on health, Recommended Dietary Allowance (RDA), nutrition for special groups and nutritional status assessment. This course also covers the nutritional changes occurring during processing and storage of food.

FST4201 Kaedah Pantas Dalam Analisis Makanan/ *Rapid Methods in Food Analysis* 3 (2 + 1)

Prasyarat : FST3202

Kursus ini meliputi genetik asas dalam tumbuhan dan haiwan, prinsip asas dan aplikasi diagnostik dan mengaplikasi kit teknologi pantas untuk analisis makanan.

This course covers basic genetics and its organization in microorganisms and higher organisms, diagnostic principles and their applications of kits for rapid food analysis.

FST4505 Biopemprosesan Makanan/ *Food Bioprocessing* 3 (3 + 0)

Prasyarat : Tiada

Kursus ini meliputi sejarah dan tren penggunaan enzim, sumber enzim industri, aplikasi enzim dalam industri makanan dan ramuan makanan, status enzim dalam peraturan makanan, dan isu terkini tentang penggunaan enzim. Kursus ini juga meliputi sejarah dan prinsip fermentasi makanan, jenis fermentasi makanan, kultur pemula, penggunaan mikroorganisma dalam industri makanan dan ramuan makanan, dan isu terkini dalam penggunaan mikroorganisma.

This course covers the history and trend of enzyme application, sources of industrial enzymes, application of enzymes in food and food ingredient industries, status of enzymes in food law and regulations, and current issues in enzyme applications. This course also covers the history and principles of food fermentation, types of food fermentation, starter cultures, applications of microorganisms in the food and food ingredient industries, and current issues in microbial applications

FST4607 Toksikologi Makanan/ *Food Toxicology* 3 (3 + 0)

Prasyarat : FST3115

Kursus ini meliputi pembelajaran tentang aspek-aspek asas kimia dan biologi dalam toksikologi makanan, biotransformasi, penilaian risiko, bahan toksik semulajadi, bahan pencemar dan aditif makanan. Peranan dan kesan sampingan bahan-bahan tersebut dalam sistem makanan juga diliputi. Kursus ini juga meliputi perkaitan di antara bahan kimia dalam makanan dan mekanisma pembentukan kanser dalam makanan akan turut dibincangkan.

This course covers the basic chemical and biological aspects of food toxicology, biotransformation, risk assessment, natural toxicants, food-borne toxins and food additive. Their roles and side effect of toxicants in the food system shall also be covered. This course also covers the relationship between food chemicals and mechanism of carcinogenesis in food.

FST4608 Keselamatan Makanan/ *Food Safety* 3 (3 + 0)

Prasyarat : FST3202 dan FST3115

Kursus ini merangkum konsep kualiti dan aplikasi Sistem Pengurusan Keselamatan Makanan, Sistem Pengurusan Kualiti Makanan, dan Pengurusan Kualiti Menyeluruh oleh industri makanan. Kursus ini juga meliputi permasalahan pengurusan kualiti dan cadangan penyelesaiannya bagi meningkatkan kualiti makanan.

This course covers the concept of quality, and application of Food Safety Management System, Food Quality Management Systems, and Total Quality Management in the food industry. This course also covers issues of quality management and proposed solutions for improving the quality of food.

FST4610 Pengurusan Kualiti Makanan/ *Food Quality Management* 3 (3 + 0)

Prasyarat: FST4608

Kursus ini merangkum konsep kualiti dan aplikasi Sistem Pengurusan Keselamatan Makanan, Sistem Pengurusan Kualiti Makanan, dan Pengurusan Kualiti Menyeluruh oleh industri makanan. Kursus ini juga meliputi permasalahan pengurusan kualiti dan cadangan penyelesaiannya bagi meningkatkan kualiti makanan.

This course covers the concept of quality, and application of Food Safety Management System, Food Quality Management Systems, and Total Quality Management in the food industry. This course also covers issues of quality management and proposed solutions for improving the quality of food.

FST4705 Makanan Fungsian/ *Functional Food* 3 (3 + 0)

Prasyarat : FST3302

Kursus ini meliputi sebatian fungsian dalam makanan, prospek masa hadapan makanan fungsian, kebaikannya kepada kesihatan dan mekanisma yang dicadangkan, kebolehdapatanbio, kawalan kualiti dan piawaian, kajian keberkesanan, isu keselamatan dan status peraturan makanan.

This course covers functional compounds in foods, future prospects, their health benefits and proposed mechanisms, effects of processing on bioactive compounds, bioavailability, quality control and standardization, efficacy studies, safety issues, regulatory status and of functional food.

FST4823 Kebersihan Makanan dan Sanitasi/ *Food Hygiene and Sanitation* 3 (3 + 0)

Prasyarat : FST3201

Kursus ini merangkumi prinsip kebersihan dan sanitasi dalam industri pembuatan dan penyediaan makanan. Reka bentuk bersih dan konsep Cleaning-In-Place (CIP) turut dibincangkan.

This course covers principles of hygiene and sanitation in the industry of food service and manufacturing. Hygienic design and Cleaning-In-Place (CIP) concept are also discussed.

FST4824 Pengurusan Kualiti Makanan/ *Food Quality Management* 3 (3 + 0)

Prasyarat : Tiada

Kursus ini merangkumi konsep sistem pengurusan kualiti dan keselamatan makanan dalam industri makanan. Penilaian keberkesanan dan aplikasi statistik dalam kawalan proses turut dibincangkan.

This course covers concept of food quality and food safety management systems in food industry. Evaluation of effectiveness and application of statistical process control will also be discussed.

FST4833 Pengendalian Lepastuai Buah-buahan dan Sayur-sayuran/ *Postharvest Handling of Fruits and Vegetables* 3 (2 + 1)

Prasyarat : FST4830 dan FST4826

Kursus ini memperkenalkan pengendalian lepastuai buahan dan sayuran yang meliputi perubahan biokimia dan biofisikal lepastuai, aktiviti pengendalian lepastuai, kriteria kualiti dan indeks kematangan, kaedah rawatan, peranan dan kesan pembungkusan, suhu dan kelembapan relatif. Kursus ini juga meliputi pembaziran lepastuai dan gangguan fisiologi semasa penstoran buahan dan sayuran.

This course introduces postharvest handling of fruits and vegetables which encompasses biochemical and biophysical changes after harvest, postharvest activities, quality criteria and maturity index, methods of treatments, role and effect of packaging, temperature and relative humidity. This course also covers postharvest wastage and physiological disorder of fruits and vegetables during storage.

FST4959A	Disertasi Bachelor/ <i>Bachelor Dissertation</i>	6 (0 + 6)
dan B		

Prasyarat : Pelajar Semester 6 (FST4959A) dan Semester 7 (FST 4959B) BSTM

Kursus ini bertujuan untuk melengkapkan pelajar dengan kemahiran dan pengetahuan yang diperlukan untuk menyelesaikan masalah sains dan teknologi makanan pada tahap kesukaran yang bersesuaian. Kajian menggabung ilmu dan kemahiran yang diperolehi dari kursus terdahulu menerusi kajian terbimbing. Ia memerlukan pelajar untuk meninjau literature, menyediakan cadangan penyelidikan, menjalankan kajian yang bersesuaian, mengumpul dan menganalisis data, mentafsir dan membincang keputusan penyelidikan dan merumus penemuan kajian.

This course aims to equip student with skills and knowledge necessary to solve a problem of appropriate complexity in food science and technology. The study integrates knowledge and skills acquired from previous courses through guided research. It requires the student to review the literature, prepare a research proposal, conduct appropriate experiments, collect and analyse data, interpret and discuss research results, and conclude findings of the study.

FSM4901	Latihan Industri/ <i>Industrial Training</i>	12 (0 + 12)

Prasyarat : FST 4959

Kursus ini memberi peluang kepada pelajar untuk menilai teknologi yang digunakan dalam industri makanan dan menimba pengalaman kerja dalam persekitaran industri berkenaan. Latihan dijalankan di agensi kerajaan atau swasta selama 24 minggu untuk pendedahan kepada perancangan dan penyelarasaran kerja di bawah penyeliaan pegawai tempat latihan industri yang dilantik.

This course provides students with the opportunity to evaluate the technologies used in the food industry and gain experience working in an environment in the industry. The training is carried out over a period of 24 weeks at government or private agencies for exposure on work planning and coordination under the supervision of an appointed officer of the agency.

Jabatan Teknologi Makanan/ Department of Food Technology

FSM3001 Pengenalan Kepada Industri Makanan 3 (3 + 0)
Introduction to Food Industry

Prasyarat : Tiada

Kursus ini merangkumi sejarah dan perkembangan industri makanan. Prinsip sains dan teknologi dalam pemprosesan, penyediaan dan perkhidmatan makanan serta operasi dan pengurusan dalam industri makanan turut dibincangkan.

This course covers the history and development in the food industry. The principles of food science and technology in processing, preparation and food service, as well as operations and management in the food industry will be discussed.

FSM3101 Kimia dan Fungsi Ramuan Makanan/ *Chemistry and Functionality of Food Ingredients* 3 (2 + 1)

Prasyarat : Tiada

Kursus ini merangkumi peranan, sifat dan aplikasi komponen makanan dalam penghasilan produk. Peranan dan kesan ramuan turut dibincangkan.

This course covers the role, properties and application of food components in food production. The functions and effects of ingredients will be discussed.

FST3301 Prinsip Pemprosesan Dan Pengawetan Makanan/ *Principles of Food Processing and Preservation* 4 (3+1)

Prasyarat : Tiada

Kursus ini meliputi ciri-ciri kualiti makanan, akibat dan kesan kerosakan makanan, konsep rintangan, pemanasan, penyejukan dan pendinginan, pengeringan, pemekatan, penyinaran, tekanan ultratinggi dan ultrasonikasi, pembungkusan dan aditif makanan.

This course covers characteristics of food quality, results and effect of food spoilage, hurdle concept, heating, refrigeration, drying, evaporation, irradiation, ultra high pressure and ultrasonication, packaging and food additives.

FST3302 Asas Pemprosesan Dan Pengawetan Makanan/ *Fundamentals of Food Processing and Preservation* 3 (3 + 0)

Prasyarat : Tiada

Kursus ini meliputi ciri-ciri kualiti makanan, akibat dan kesan kerosakan makanan, konsep rintangan, pemanasan, penyejukan dan pendinginan, pengeringan, pemekatan, penyinaran, tekanan ultratinggi dan ultrasonikasi, pembungkusan dan aditif makanan.

This course covers characteristics of food quality, results and effect of food spoilage, hurdle concept, heating, refrigeration, drying, evaporation, irradiation, ultra high pressure and ultrasonication, packaging and food additives.

FST3304 Operasi Unit Pemprosesan Makanan I/ *Unit Operations in Food Processing I* 4 (3 + 1)

Prasyarat : FST3401

Kursus ini meliputi prinsip-prinsip operasi unit fizikal dan sampingan dalam pemprosesan makanan. Ini termasuk pengecilan saiz dan penurusan pepejal, penghomogenan dan pengemulsian, pencampuran, teknik pemisahan dan pengekstrakan. Teknik yang berkaitan dengan makanan

terproses seperti pembungkusan, penyempritan dan pembentukan juga akan dibincangkan.

This course covers the principles of physical unit and ancillary operations in food processing. These include size reduction and solids filtration, homogenization and emulsification, mixing, separation techniques and extraction. Techniques that are associated with processed foods such as packaging, extrusion and forming will also be discussed.

FST3305	Operasi Unit Pemrosesan Makanan II/ <i>Unit Operation in Food Processing II</i>	3 (2 + 1)
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Prasyarat : FST3401, FST3304

Kursus ini meliputi prinsip operasi unit pengawetan dalam pemrosesan makanan, teknik pengawetan seperti pemrosesan terma, pengawetan suhu rendah, pengeringan, penyejatan dan pemekatan, pemrosesan tekanan tinggi dan penyinaran makanan.

This course covers the principles of food preservation unit operations in food processing, preservation techniques such as thermal processing, low temperature preservation, dehydration, evaporation and concentration, high pressure processing and food irradiation.

FST3401	Asas Kejuruteraan Makanan/ <i>Fundamentals of Food Engineering</i>	3 (2 + 1)
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Prasyarat : Tiada

Kursus ini meliputi pengenalan kepada kejuruteraan makanan, unit dan dimensi, analisis dimensi,imbangan jisim dan tenaga, termodinamik dan refrigerasi, aliran bendarilir, pemindahan haba dan jisim pemindahan haba tak mantap, psikrometri. Amali yang dijalankan menekankan prinsip asas kejuruteraan makanan.

This course covers the introduction to food engineering, units and dimensions, dimensional analysis, mass and energy balances, thermodynamics and refrigeration, fluid flow, heat and mass transfer, unsteady state heat transfer, psychrometry. Laboratory practical emphasizes basic principles of food engineering.

FST3404	Operasi Unit Pemrosesan Makanan I/ <i>Unit Operations in Food Processing I</i>	3 (2 + 1)
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Prasyarat : FST3401

Kursus ini meliputi prinsip-prinsip operasi unit fizikal dan sampingan dalam pemrosesan makanan. Ini termasuk pengecilan saiz dan penurasan pepejal, penghomogenan dan pengemulsian, pencampuran, teknik pemisahan dan pengekstrakan. Kursus ini juga merangkum aplikasi teknik yang berkaitan dengan makanan terproses seperti pembungkusan, penyempritan dan pembentukan.

This course covers the principles of the physical unit and ancillary operations in food processing. These include size reduction and solids filtration, homogenization and emulsification, mixing, separation techniques and extraction. This course also covers the application of techniques that are associated with processed foods such as packaging, extrusion and forming.

FST3405	Operasi Unit Pemrosesan Makanan II/ <i>Unit Operations in Food Processing II</i>	3(2 + 1)
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Prasyarat : FST3404

Kursus ini meliputi prinsip operasi unit pengawetan dalam pemrosesan makanan, teknik pengawetan seperti pemrosesan terma, pengawetan suhu rendah, pengeringan, penyejatan dan pemekatan, pemrosesan tekanan tinggi dan penyinaran makanan.

This course covers the principles of food preservation unit operations in food processing, preservation techniques such as thermal processing, low temperature preservation, dehydration, evaporation and concentration, high pressure processing and food irradiation.

concentration, high pressure processing and food irradiation.

FSM3601 Pengurusan Operasi dalam Industri Makanan/ *Food Industry Operations Management* 3 (3 + 0)

Prasyarat : FSM3001 dan MTH3003

Kursus ini meliputi aplikasi teknik analitikal dalam industri pembuatan makanan. Penekanan diberi kepada aplikasi teori pemodelan untuk merancang dan membuat keputusan.

This course covers the analytical techniques application in the food manufacturing industry. The course focuses on the application of modeling theory to planning and decision-making.

FST3602 Makanan Halal/ *Halal Food* 2 (2 + 0)

Prasyarat : FST3404

Kursus ini memperkenalkan konsep makanan halal dan haram dalam Islam, rantai makanan halal yang melibatkan konsep pemprosesan dan penyediaan makanan halal dari ladang ke pinggan. Kursus ini juga meliputi peraturan dan perundangan berhubung dengan makanan halal, analisis, piawaian makanan halal MS1500:2009, pensijilan dan logo halal, kaitan halal dan sistem kualiti produk halal. Ia juga membincangkan isu semasa dalam industri dan perkhidmatan makanan serta pasaran halal global.

This course introduces the concept of halal and haram food in Islam, halal food chain involving halal food processing and preparation concept from farm to plate. The course also covers regulations and legislation related to halal food, analysis, halal standard MS1500:2009, halal certification and logo, relationship between halal and quality systems for halal products. It also discusses current issues in global halal food and food service industries and market

FST4001 Makanan Halal/ *Halal Food* 2 (2 + 0)

Prasyarat : Tiada

Kursus ini meliputi konsep makanan halal dan haram dalam Islam, sumber makanan halal dan haram, kaedah penyembelihan, konsep pemprosesan makanan halal dari ladang ke pinggan, ramuan dan aditif makanan halal. Kursus ini juga membincangkan peraturan dan perundangan berhubung dengan makanan halal, analisis, piawaian makanan halal MS1500:2004, pensijilan dan logo halal, kaitan halal dan sistem kualiti dan insentif produk halal. Isu semasa dalam industri dan pasaran makanan halal global juga akan dibincangkan.

This course covers the concept of halal and haram in Islam, sources of halal and haram food, slaughtering methods, halal food processing concept from farm to plate, halal food ingredients and additives. The course also cover regulations and legislation related to halal food, analysis halal standard MS1500:2004, halal certification and logo, relationship between halal and quality systems and halal products incentives. Current issues in global halal food industries and market will also be discussed.

FSM4401 Sistem Maklumat Pengurusan dalam Industri Makanan/ *Information System in Food Industry* 3 (2 + 1)

Prasyarat : Tiada

Kursus ini merangkumi pengurusan sistem maklumat yang meliputi aspek pengurusan, organisasi, penggunaan teknologi, pentadbiran dan pemasaran dalam industri pembuatan makanan.

This course covers the computer technology management which includes the aspect of management, organization, technology usage, administration and marketing in the food manufacturing industry.

FST4405 Sifat Kejuruteraan Makanan/ *Engineering Properties of Foods* 3 (2 + 1)

Prasyarat : FST3401

Kursus ini meliputi sifat kejuruteraan makanan merangkumi sifat fizikokimia bahan biologi dan makanan, air dan sifat makanan, sifat reologi makanan pepejal, sifat reologi makanan viskoelastik, sifat terma makanan, sifat aerodinamik dan hidrodinamik makanan, dan sifat optik makanan.

This course covers engineering properties of food encompassing biological and physico-chemical properties of foods, water and food properties, rheological properties of solid foods, rheological properties of viscoelastic foods, thermal properties of foods, aerodynamic and hydrodynamic properties of foods, and optical properties of foods.

FST4406 Rekabentuk Proses dan Loji Makanan/ *Food Process and Plant Design* 4 (4 + 0)

Prasyarat : FST3304 dan FST3305

Kursus ini meliputi prinsip dan prosedur dalam membangun dan merencana loji dalam industri makanan, perkembangan proses dan projek makanan, penilaian proses dan loji makanan, penilaian projek dan pelaburan, pemilihan dan spesifikasi alatan, pemilihan tapak dan susun atur loji, pengurusan projek makanan, pengurusan sistem kawalan kualiti dan keselamatan proses dan loji makanan, kajian kes perancangan perniagaan projek makanan.

This course covers principles and procedures in developing plant and planning in food industry, development of food projects and processes, evaluation of food processes and plants, project evaluation and investment, equipment selection and specifications, site selection and plant layout, food project management, food plant and process safety and quality control system management, case studies on business plans of food projects.

FST4407 Pengurusan Operasi Loji Makanan/ *Operational Management of Food Plant* 3 (3 + 0)

Prasyarat : FST3405

Kursus ini membincangkan pengurusan operasi loji makanan, pra-operasi loji, semasa operasi loji, pengoptimuman operasi, pasca operasi, pemberian operasi, teknologi pembuatan terkini, kajian kes pembuatan dan pemasaran produk.

This course covers operational management of food plant, preoperational, current, optimization and post operational activities, operations improvement, new manufacturing technologies, case studies on manufacturing and marketing of products.

FST4408 Pembungkusan Makanan/ *Food Packaging* 3 (2 + 1)

Prasyarat : FST3302 atau FST4826

Kursus ini merangkum pembungkusan makanan meliputi konsep dan fungsi pembungkusan, perlindungan makanan, bahan pembungkus dan pembuatan, kaedah ujian terhadap bahan pembungkus, jenis kegagalan dalam pembungkusan, bentuk sistem pembungkusan, pembungkusan dan aplikasi, alatan pembungkusan, peraturan dan undang-undang pembungkusan makanan, dan perkembangan semasa dan masa depan dalam bidang pembungkusan makanan.

This course covers food packaging which encompasses concept and functions of packaging, food protection, packaging materials and manufacturing, packaging materials testing methods, type of failures in food packaging, forms of packaging system, packaging and application, packaging equipment, laws and regulation on food packaging, active packaging, smart packaging and current and future developments in food packaging.

FST4409	Pengurusan Air Dan Air Buangan Industri Makanan/ <i>Water and Waste Management in Food Industry</i>	2 (2 + 0)
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Prasyarat : FST4608

Kursus ini meliputi pandangan keseluruhan pengurusan air, bekalan dan pengurusan air, sifat kimia air, rawatan air konvensional, rawatan air lanjutan, pengurusan air buangan, rawatan primer, sekunder dan tertier, pertimbangan ekonomik dan reka bentuk, dan isu semasa.

This course covers an overview of water management, water supply and management, chemical properties of water, conventional water treatment, advance water treatment, waste water management, primary, secondary and tertiary treatments of industrial waste water, economics and design consideration, and current issues.

FST4410	Kejuruteraan Sisa Industri Makanan/ <i>Food Industry Waste Engineering</i>	2 (2 + 0)
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Prasyarat : Tiada

Kursus ini merangkum kejuruteraan sisa industri makanan meliputi sumber dan klasifikasi sisa industri, masalah pengurusan sisa, proses rawatan sisa secara fizikal dan kimia, integrasi proses fizikal dan biologi, proses rawatan sisa secara terma, dan strategi pengurangan sisa.

This course covers food industry waste engineering which encompasses sources and classification of industrial wastes, problems in waste management, physical and chemical waste treatment processes, integrated physical and biological processes, thermal waste treatment processes, and waste reduction strategies.

FST4411	Reka Bentuk Loji Makanan/ <i>Food Plant Design</i>	3 (3 + 0)
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Prasyarat : FST3405

Kursus ini meliputi prinsip dan prosedur pembangunan loji makanan. Pengurusan dan penilaian keboleharapan ekonomi projek turut diberi penekanan.

This course covers the principles and procedures in developing a food processing plant. It also emphasizes project management and economics assessment.

FSM4502	Pemasaran dan Penjualan dalam Industri Makanan/ <i>Marketing and Sales in Food Industry</i>	3 (3 + 0)
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Prasyarat : Tiada

Kursus ini merangkumi prinsip pemasaran dan gelagat pengguna dalam industri pembuatan makanan. Aktiviti perancangan pemasaran dan penjualan turut dibincangkan.

This course covers the marketing principles and consumer behaviour in food manufacturing industry. The activities pertaining to marketing planning and sales will be discussed.

FST4609	Perundangan Makanan/ <i>Food Law</i>	3 (3 + 0)
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Prasyarat : FST4828

Kursus ini meliputi perundangan makanan di Malaysia merangkumi Akta Makanan 1983 dan Peraturan Makanan 1985 termasuk pentadbiran dan penguatkuasaan, perlantikan juruanalisis dan pegawai penguatkuasa, kuasa dan prosedur persampelan, piawaian, pembungkusan dan pelabelan makanan, aditif dan zat makanan, kuasa membuat peraturan, pendakwaan serta penarikan semula produk. Kursus ini juga meliputi undang-undang Malaysia lain yang berkaitan dengan industri makanan seperti Peraturan- Peraturan Kebersihan Makanan 2009, Akta Juruanalisis Makanan 2011,

peranan Jabatan Kastam dan Eksais DiRaja, Codex Alimentarius dan pergerakan pengguna.

This course covers Food Laws Malaysia i.e. Food Act 1983 and Food Regulations 1985 which includes administration and enforcement, appointment of analysts and authorised officers, power and procedure of sampling, standards, packaging and labelling of foods, additives and food composition, power to make regulations, litigation and product recall. This course also covers other laws of Malaysia concerning the food industry such as Food Hygiene Regulations 2009, Food Analysts Act 2011, the role of Royal Customs and Excise Department, Codex Alimentarius and consumer movements.

FSM4658 Isu Semasa dalam Perniagaan Makanan/ Current Issue in Food Business 3 (3 + 0)

Prasyarat : Tiada

Kursus ini merangkumi perbincangan mengenai isu semasa dalam industri makanan. Cadangan dan tindakan penyelesaian untuk isu semasa turut diberi penekanan.

This course covers the discussion of current issues in food industry. Proposal and solution to the current issues are also emphasized.

FSM4801 Seminar/ Seminar 1 (0 + 1)

Prasyarat : Tiada

Kursus ini merangkumi persediaan dan teknik pembentangan berkesan. Pelajar perlu membentang penemuan projek penyelidikan yang telah dijalankan.

This course covers the preparation and effective presentation techniques. Students are required to present the findings of their research project.

FST4825 Perundangan Makanan/ Food Law 2 (2 + 0)

Prasyarat : BSTM = FST4821, BS(PMK) = FST4826

Kursus ini meliputi perundangan makanan di Malaysia merangkumi Akta Makanan 1983 dan Peraturan Makanan 1985 termasuk pentadbiran dan penguatkuasaan, perlantikan juruanalisis dan pegawai penguatkuasa, kuasa dan prosedur persampelan, piawaian, pembungkusan dan pelabelan makanan, aditif dan zat makanan, kuasa membuat peraturan, pendakwaan serta pemanggilan balik produk. Undang-undang Malaysia lain yang berkaitan dengan industri makanan, peranan Jabatan Kastam dan Eksais DiRaja, Codex Alimentarius dan pergerakan pengguna juga akan dibincangkan.

This course covers Food Laws Malaysia i.e. Food Act 1983 and Food Regulations 1985 which includes administration and enforcement, appointment of analysts and authorised officers, power and procedure of sampling, standards, packaging and labelling of foods, additives and food composition, power to make regulations, litigation and product recall. Other laws of Malaysia concerning the food industry, the role of Royal Customs and Excise Department, Codex Alimentarius and consumer movements will also be discussed.

FST4826 Pemprosesan Hasilan Tumbuhan Dan Haiwan/ Processing of Plant and Animal Products 4 (3 + 1)

Prasyarat : FSM3101

Kursus ini merangkumi komposisi kimia serta perubahan sifat fiziko-kimia hasilan tumbuhan dan haiwan semasa pengendalian dan pemprosesan. Teknologi penghasilan dan analisis kualiti berkaitan pelbagai hasilan berasaskan tumbuhan dan haiwan turut diberi penekanan dalam amali yang dijalankan.

This course covers chemical composition and changes in the physico-chemical properties of plant and animal products during handling and processing. Technology and analysis of quality related to various plant and animal based products will also be emphasized during laboratory practical.

FST4828 Pembangunan Produk Makanan Baru/ *New Food Product Development* 3 (1 + 2)

Prasyarat : FST4832, FST4408

Kursus ini merangkumi pembangunan produk makanan baharu yang meliputi peranan dan kepentingan perkembangan produk baharu dalam syarikat pengeluaran makanan, takrifan produk, penjanaan idea, tinjauan pengguna, penilaian dan penyaringan idea. Pelajar akan dilatih tentang kaedah membina konsep produk, merancang projek, menghasilkan prototaip, menguji dan mengenalpasti kecacatan produk serta menyelesaikan masalah. Pelajar akan berpengalaman dalam proses pembangunan produk, merancang pengeluaran menjalankan ujian pengguna, pemasaran dan pelancaran produk.

This course covers new food product development which encompasses the role and importance of new product development in a food manufacturing company, definition of product, idea generation, consumer survey, idea evaluation and screening. Students will be trained in development of product concept, project planning, production of prototype, testing and identification of defects as well as problem solving. Students will have experience in the product development process, production plan, consumer testing, marketing and product launching.

FST4829 Penilaian Deria Makanan/ *Sensory Evaluation of Food* 3 (2 + 1)

Prasyarat : MTH3003

Kursus ini merangkumi konsep penilaian deria serta kegunaannya, kaedah penilaian deria, pemilihan dan latihan ahli panel, format dan tatacara memperolehi data, penyediaan dan persembahan sampel, faktor mempengaruhi pengukuran penilaian deria, pengujian pengguna dan analisis data.

This course covers sensory evaluation concept and its applications, sensory evaluation method, selection and training of panel members, format and techniques for obtaining data, preparation of sample for presentation, factors which influence measurement of sensory evaluation, consumer testing and data analysis.

FST4830 Teknologi Pemprosesan Hasilan Tumbuhan/ *Processing Technology of Plant Products* 3 (2 + 1)

Prasyarat : FST3302

Kursus ini merangkum teknologi pemprosesan hasilan tumbuhan dan meliputi perubahan fisiko-kimia dan biokimia lemak dan minyak, buah dan sayur, kekacang dan bijirin, semasa pengendalian, pemprosesan dan penyimpanan.

This course covers the processing technology of plant products which includes the physico-chemical and biochemical changes in fats and oils, fruits and vegetables, cereals and legume products during handling, processing and storage.

FST4831 Teknologi Pemprosesan Hasilan Haiwan/ *Processing Technology of Animal Products* 3 (2 + 1)

Prasyarat : FST3302

Kursus ini merangkum teknologi pemprosesan hasilan haiwan dan meliputi perubahan fisiko-kimia dan biokimia daging, makanan laut dan tenusu semasa pengendalian dan pemprosesan dan penyimpanan.

This course covers processing technology of animal products which includes the physico-chemical and biochemical changes in meat, seafoods and dairy products during handling, processing and

storage.

FST4832 Penilaian Deria Makanan/ *Sensory Evaluation of Food* 2(1 + 1)

Prasyarat : MTH3003

Kursus ini merangkumi konsep penilaian deria serta kegunaannya, kaedah penilaian deria, pemilihan dan latihan ahli panel, format dan tatacara memperolehi data, penyediaan dan persempahanan sampel, faktor mempengaruhi pengukuran penilaian deria, pengujian pengguna dan analisis data.

This course covers sensory evaluation concept and its applications, sensory evaluation method, selection and training of panel members, format and techniques for obtaining data, preparation of sample for presentation, factors which influence measurement of sensory evaluation, consumer testing and data analysis.

FST4834 Teknologi Minyak Dan Lemak/ *Technology of Oils and Fats* 3 (2 + 1)

Prasyarat : FST4830 dan FST4826

Kursus ini merangkum kimia dan teknologi minyak dan lemak yang meliputi komposisi dan ciri pelbagai jenis kumpulan, teknologi pemprosesan, analisis lemak dan minyak, ciri fizikal lemak, minyak dan produk terbitan lemak, tindakbalas kerosakan lemak dan minyak, teknologi modifikasi minyak, teknologi pembuatan produk minyak, lemak dan lemak khusus, aspek persekitaran pemprosesan lemak dan minyak serta kajian kes.

This course covers chemistry and technology of oil and fat which includes different compositions and properties of various fats and oils, processing technology, analysis of fats and oils, physical properties of fats, oils and fats by-products, deteriorative reactions of fats and oils, technology of fats modification, manufacturing technology of fats, oils and specialty fats, environmental aspects of fats and oils processing and case study.

FST4835 Teknologi Bijirin dan Kekacang/ *Cereals and Legumes Technology* 3 (2 + 1)

Prasyarat : FST4830 dan FST4826

Kursus ini merangkum teknologi bijirin dan kekacang yang meliputi penggunaan, penghasilan dan penilaian kualiti bijirin dan kekacang serta hasilannya, isu semasa dan penemuan baru.

This course covers cereals and legumes technology which includes utilization, production and the quality evaluation of cereals and legumes; and their products, current issues and new findings.

FST4836 Teknologi Tenusu/ *Dairy Technology* 3 (2 + 1)

Prasyarat : FST4831 dan FST4826

Kursus ini meliputi komposisi susu, fisiologi laktasi, pemprosesan susu cair, hasilan susu cair dan pekat, klasifikasi dan integrase^{ly} krim, mentega dan AMF, klasifikasi dan integrase^{ly} aiskrim, pemprosesan yogurt, keju dan susu tepung, integrasi sanitasi dan nyahinfeksi dan penemuan terbaru dalam teknologi tenusu.

This course covers the composition of milk, physiology of lactation, processing of fluid milk, fluid and concentrated milk and their products, classification and terminology of cream, butter and AMF, classification and terminology of ice cream, processing of yogurt, cheese and powdered milk, sanitation and disinfection system, and new findings in dairy technology.

FST4837 Teknologi Minuman/ *Beverage Technology* 3 (2 + 1)

Prasyarat : FST4830 dan FST4826

Kursus ini merangkum klasifikasi minuman, kaedah pemprosesan jus buah-buahan, minuman kopi dan the, minuman berkarbonat, minuman fungsian dan kesihatan termasuk minuman air botol.

Kursus ini juga menekankan mengenai peralatan yang digunakan, ramuan dan fungsi spesifik, kestabilan produk dan kualiti, aspek peraturan dan spesifikasi produk.

This course covers classification of beverages, processing methods of fruit juice, coffee, tea, carbonated drinks, functional and health drinks including bottled water. This course also emphasizes on the equipment used, ingredients and their specific functions, product stability and quality, aspects on regulations and product specifications.

FST4838 Teknologi Konfeksi Coklat dan Gula/ Chocolate and Sugar Confectionery Technology 3 (2 + 1)

Prasyarat : FST4830 dan FST4826

Kursus ini merangkumi jenis dan ciri produk konfeksionari, ramuan dalam pembuatan coklat, pembuatan konfeksi, kualiti produk coklat, ramuan konfeksi gula dan kualiti, sifat konfeksi gula dan pembuatan konfeksi lain.

This course covers chocolate and sugar confectionary technology encompasses types and attributes of confectionary products, ingredients in chocolate manufacturing, confectionary manufacturing quality of chocolate products, ingredients and quality of sugar confectionaries, properties of sugar confectionary and manufacturing of other confectionaries.

FST4839 Teknologi Hasilan Akuatik/ Aquatic Product Technology 3 (2 + 1)

Prasyarat : FST4831 dan FST4826

Kursus ini merangkum ciri-ciri fisiko-kimia dan biokimia hasilan akuatik, pengendalian selepas penangkapan; prinsip pengawetan pada suhu rendah, teknologi pemprosesan surimi dan hasilannya, hasilan sampingan integras akuatik, teknik pengawetan, proses pengetinan dan pengawalan kualiti makanan akuatik.

This course covers physicochemical and biochemical properties of aquatic products, post-harvest handling principles of preservation at low temperature, preservation techniques, canning process and quality control of aquatic food.

FST4840 Teknologi Daging/ Meat Technology 3 (2 + 1)

Prasyarat : FST4831 dan FST4826

Kursus ini merangkum tren dalam integras daging dan corak pengambilan daging, mekanisma dalam pengecutan otot, penyembelihan haiwan, teknik pengawetan dan pengkiuran, sosej dan hasilan hancur, hasilan bentuk semula, penyalutan hasilan daging, hasilan kering dan separa kering, pembungkusan dan pengedaran hasilan daging.

This course covers trends in meat industry and meat consumption pattern, mechanisms in muscle contraction, animal slaughtering, preservation and curing techniques, sausage and minced products, reformed products, breading of meat products, dry products and half-dry products, packaging and distribution of meat products.

FST4914 Kejuruteraan Sisa Industri Makanan/ Food Industry Waste Engineering 2 (2 + 0)

Prasyarat : Tiada

Kursus ini merangkumi kejuruteraan sisa integras makanan meliputi sumber dan klasifikasi sisa integras, masalah pengurusan sisa, proses rawatan sisa secara fizikal dan kimia, integrase proses fizikal dan biologi, proses rawatan sisa secara terma, dan strategi pengurangan sisa.

This course covers food industry waste engineering which encompasses sources and classification of industrial wastes, problems in waste management, physical and chemical waste treatment processes, integrated physical and biological processes, thermal waste treatment processes, and waste reduction strategies.

Jabatan Pengurusan Dan Khidmat Makanan/ Department of Food Service and Management

FSM3001 Pengenalan Industri Makanan/ *Introduction to Food Industry* 3 (3 + 0)

Prasyarat : Tiada

Kursus ini merangkumi sejarah dan perkembangan industri makanan. Prinsip sains dan teknologi dalam pemprosesan, penyediaan dan perkhidmatan makanan serta operasi dan pengurusan dalam industri makanan turut dibincangkan.

This course covers the history and development in the food industry. The principles of food science and technology in processing, preparation and foodservice, as well as operations and management in the food industry will be discussed.

FSM3101 Kimia dan Fungsi Ramuan Makanan/ *Chemistry and Functionality Of Food Ingredients* 3 (2 + 1)

Prasyarat : Tiada

Kursus ini merangkumi peranan, sifat dan aplikasi komponen makanan dalam penghasilan produk. Peranan dan kesan ramuan turut dibincangkan.

This course covers the role, properties and application of food components in food production. The functions and effects of ingredients are also be discussed.

FSM3203 Kefungsian Ramuan Makanan
/Functionality Of Food Ingredients 3 (2 + 1)

Prasyarat : Tiada

Kursus ini merangkumi peranan, sifat dan aplikasi komponen makanan dalam penyediaan makanan dan penghasilan produk. Peranan dan kesan ramuan turut dibincangkan.

This course covers the role, properties and application of food components in food preparation and production. The functions and effects of ingredients are also be discussed.

FSM3204 Pemakanan Dalam Perkhidmatan Makanan
/Nutrition In Foodservice 3 (2 + 1)

Prasyarat : Tiada

Kursus ini merangkumi ciri nutrien dan kepentingannya dalam penyediaan menu yang seimbang untuk masyarakat umum dan kumpulan tertentu. Perubahan kandungan nutrien semasa penstoran, pemprosesan dan penyediaan makanan turut diberi penekanan.

This course covers the properties of nutrients and their importance in preparing a balanced menu for the general public and specific group. The changes in nutrient content during storage, processing and food preparation are also emphasized.

FSM3205 Mikrobiologi Dalam Perkhidmatan Makanan/*Microbiology In Foodservice* 3 (2 + 1)

Prasyarat : Tiada

Kursus ini merangkumi kepentingan dan kesan bahaya mikrorganisma kepada industri perkhidmatan makanan. Kepentingan keselamatan dan pengendalian makanan turut diberi penekanan.

This course covers the importance and effects of microbiological hazard on the foodservice industry. The importance of food safety and handling is also emphasized.

FSM3302 Teori Asas Penyediaan Makanan/ *Basic Theory Of Food Preparation* 3 (3 + 0)

Prasyarat : Tiada

Kursus ini merangkumi prinsip, teknik dan kemahiran penyediaan makanan berkuantiti. Penekanan diberikan kepada pengurusan bahan mentah, pengeluaran produk dan perhubungan antara perorangan.

This course covers the principles, techniques and skills needed in quantity food production. Emphasize is given to the management of raw materials, food production and interpersonal skills.

FSM3303 Amali Asas Penyediaan Makanan
/Fundamental Laboratory For Food Preparation 2 (0 + 2)

Prasyarat : Tiada

Kursus ini merangkumi kaedah asas penyediaan pelbagai menu. Pra-penyediaan bahan mentah, teknik penyediaan dan penyajian makanan turut dibincangkan.

This course covers the various basic menu preparations. The mis en place of raw materials, techniques of food preparation and serving are also discussed.

FSM3401 Khidmat Layanan Restoran/ *Restaurant Services* 2 (0 + 2)

Prasyarat : Tiada

Kursus ini merangkumi aspek penting dalam pengendalian pelbagai majlis mengikut budaya. Aspek layanan yang eksklusif dan hiasan makanan turut dibincangkan.

This course covers the important aspect of handling different cultural functions. The aspects of exclusive service and food garnishing are also discussed.

FSM3501 Pembangunan Menu/ *Menu Development* 3 (3 + 0)

Prasyarat : FSM3302

Kursus ini merangkumi prinsip perancangan dan kawalan kos dalam pembangunan menu. Penekanan turut diberikan kepada pembangunan menu khusus.

This course covers the principles of cost planning and control in menu development. The development of specific menu is also emphasized.

FSM3602 Sumber Manusia Dalam Perkhidmatan Makanan/*Human Resource In Foodservice* 3 (3 + 0)

Prasyarat : Tiada

Kursus ini merangkumi prinsip dan amalan pengurusan sumber manusia. Aktiviti berkaitan dengan pengambilan, latihan dan pembangunan sumber manusia turut diberi penekanan.

This course covers the principles and practices of human resource management. The human resource activities pertaining to recruitment, training and development are also emphasized.

FSM3604 Pengurusan Dan Kawalan Kos Perkhidmatan Makanan
Foodservice Management And Cost Control 3 (3 + 0)

Prasyarat : FSM3501

Kursus ini merangkumi prinsip dan konsep penting sistem kawalan kos dalam perkhidmatan makanan. Prosedur kawalan kos turut diberi penekanan.

This course covers the important principles and concepts in foodservice cost control system. The

cost control procedures are also emphasized.

FSM3605	Pembelian Berkuantiti Dalam Perkhidmatan Makanan/ <i>Quantity Procurement In Foodservice</i>	3 (3 + 0)
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Prasyarat : FSM3501

Kursus ini merangkumi proses pembelian bahan mentah dan bahan bukan makanan. Spesifikasi dan pengendalian bahan turut diberi penekanan.

This course covers the purchasing procedures for raw materials and non-food items. The specification and handling of the items are emphasized.

FSM4101	Kaedah Penyelidikan Dalam Perkhidmatan Makanan/ <i>Research Methods In Foodservice</i>	3 (2 + 1)
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Prasyarat : MTH3003

Kursus ini merangkumi prinsip asas menjalankan penyelidikan saintifik. Penggunaan perisian statistik dalam menganalisis data dan kaedah penafsiran keputusan kajian turut ditekankan.

This course covers the basic principles of conducting scientific research. The usage of statistical software to analyze data and the method of interpreting research result is also emphasized.

FSM4206	Kebersihan Dan Sanitasi Dalam Perkhidmatan Makanan <i>/Hygiene And Sanitation In Foodservice</i>	2 (2 + 0)
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Prasyarat : Tiada

Kursus ini merangkumi kepentingan sanitasi dan kebersihan dalam perkhidmatan makanan. Prinsip sanitasi dan kebersihan diri dan premis perkhidmatan makanan diberi penekanan. Amalan Pengilangan Baik dan Sistem Pengurusan Kualiti makanan turut dibincangkan.

This course covers the importance of sanitation and hygiene in foodservice operations. The principles of sanitation and hygiene for personal and foodservice establishment are emphasized. Good Manufacturing Practice (GMP) and food quality management system are also discussed.

FSM4207	Makanan Kajian Dalam Perkhidmatan Makanan/ <i>Experimental Food In Foodservice</i>	3 (1 + 2)
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Prasyarat : FSM3203, FSM3303 dan FST3301

Kursus ini merangkumi pendekatan sains dalam inovasi produk makanan. Keperluan menghasilkan produk baru dititikberatkan.

This course covers scientific approach in food product innovation. The need to produce new products is emphasized.

FSM4304	Penyediaan Makanan Lanjutan/ <i>Advanced Food Preparation</i>	3 (1 + 2)
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Prasyarat : FSM3303 Dan FSM3401

Kursus ini merangkumi penyediaan, persembahan dan perkhidmatan makanan secara komersil. Penekanan turut diberikan kepada keberkesan dan kecekapan bekerja secara berkumpulan.

This course covers commercial food preparation, presentation and service. The effectiveness and efficiency of teamwork are emphasized.

FSM4305 Kuisin Barat/ *Western Cuisine* 3 (1 + 2)

Prasyarat : FSM3303

Kursus ini merangkumi prinsip dan teknik asas penyediaan masakan barat. Penekanan turut diberikan kepada perkembangan masakan makanan barat.

This course covers the basic principles and techniques in Western cuisines preparation. Emphasize is also given to the development of Western cuisines.

FSM4306 Kuisin Asia/ *Asian Cuisine* 3 (1 + 2)

Prasyarat : FSM3303

Kursus ini merangkumi prinsip dan teknik asas penyediaan masakan Asia. Penekanan turut diberikan kepada perkembangan masakan makanan Asia.

This course covers the basic principles and techniques in Asian cuisines preparation. Emphasize is also given to the development of Asian cuisines.

FSM4503 Sistem Maklumat Dalam Perkhidmatan Makanan/ *Information System In Foodservice* 3 (2 + 1)

Prasyarat : FSM3501

Kursus ini merangkumi pengurusan sistem maklumat yang meliputi aspek perancangan, organisasi, penggunaan teknologi, pentadbiran dan pemasaran dalam institusi makanan.

This course covers the computer technology management which includes the aspect of planning, organization, technology usage, administration and marketing in the food institution.

FSM4504 Reka Bentuk Dan Susunatur Prasarana Perkhidmatan Makanan/ *Equipment Layout And Design For Foodservice Facilities* 3 (2 + 1)

Prasyarat : FSM3205, FSM3401 dan FSM3501

Kursus ini merangkumi susunatur dan reka bentuk peralatan dan kemudahan dengan cara yang berkesan. Aplikasi komputer turut diperkenalkan.

This course covers the effective layout and design of foodservice equipments and facilities. The computer application is also introduced.

FSM4601 Pengurusan Strategik dalam Industri Makanan/ *Strategic Management in Food Industry* 3 (3 + 0)

Prasyarat : ACT3211 dan FSM4502

Kursus ini merangkumi prinsip pengurusan strategik dalam industri pembuatan makanan. Proses membangunkan strategi untuk industri pembuatan makanan juga diberi penekanan.

This course covers the principles of strategic management in the food manufacturing industry. The process of strategies development in the food manufacturing industry will be emphasized.

FSM4603 Pemasaran Dan Penjualan Dalam Perkhidmatan Makanan/ *Marketing And Sales In Foodservice* 3 (3 + 0)

Prasyarat : FSM3501

Kursus ini merangkumi prinsip pemasaran dan gelagat pengguna dalam perkhidmatan makanan. Aktiviti berkaitan dengan perancangan pemasaran dan penjualan turut dibincangkan.

This course covers the marketing principles and consumer behavior in foodservice. Activities

pertaining to marketing planning and sales are also discussed.

FSM4606	Pengurusan Operasi Perkhidmatan Makanan/ <i>Foodservice Operations Management</i>	3 (3 + 0)
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Prasyarat : MTH3003

Kursus ini meliputi aplikasi teknik analitikal dalam industri perkhidmatan makanan. Penekanan diberi kepada aplikasi teori pemodelan untuk merancang dan membuat keputusan.

This course covers the application of analytical techniques in the foodservice industry. Emphasize is given to the application of modeling theory in planning and decision-making.

FSM4607	Pengurusan Strategik Perkhidmatan Makanan/ <i>Foodservice Strategic Management</i>	3 (3 + 0)
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Prasyarat : Tiada

Kursus ini merangkumi prinsip pengurusan strategik dalam perkhidmatan makanan. Proses membangunkan strategi untuk institusi perkhidmatan makanan juga diberi penekanan.

This course covers the principles of strategic management in the foodservice. The process of strategies development in the foodservice institution is also emphasized.

FSM4701	Sistem Operasi Perkhidmatan Makanan/ <i>Foodservice Operational System</i>	3 (3 + 0)
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Prasyarat : Tiada

Kursus ini memberi penekanan kepada pengurusan sistem dan operasi perkhidmatan makanan. Peningkatan produktiviti dan aplikasi teknologi turut dibincang.

This course emphasizes on the management of foodservice systems and operations. The productivity improvement and technology application are also discussed.

FSM4702	Pengurusan Makanan Dan Minuman/ <i>Food And Beverage Management</i>	3 (3 + 0)
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Prasyarat : FSM3604, FSM4504 dan FSM4603

Kursus ini merangkumi proses dan langkah serta prinsip pengurusan makanan dan minuman. Penekanan diberikan kepada pengurusan sumber secara berkesan dengan mengintegrasikan teknologi maklumat.

This course covers the processes and stages, as well as the principles in food and beverage management. Emphasize is given to effective resources management by integrating information technology.

FSM4703	Pengurusan Institusi/ <i>Institutional Management</i>	3 (3 + 0)
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Prasyarat : FSM3204, FSM3501 dan FSM4701

Kursus ini merangkumi teknik pengurusan dan pengendalian institusi perkhidmatan makanan dengan cekap. Aktiviti berkaitan dengan operasi institusi perkhidmatan makanan turut dibincangkan.

This course covers the effective techniques in managing and handling foodservice institution. Activities pertaining to the foodservice institution operations are also discussed.

FSM4704	Pengurusan Minuman Dan Bar/ <i>Beverage And Bar Management</i>	3 (3 + 0)
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Prasyarat : FSM3501 dan FSM3604
Kursus ini merangkumi prinsip penghasilan minuman beralkohol dan tak beralkohol. Pelbagai aspek pengurusan minuman turut dibincangkan.

This course covers the principles of alcoholic and non-alcoholic beverages production. The various aspects of beverage management are also discussed.

FSM4803	Perundangan Industri Perkhidmatan Makanan <i>Foodservice Industrial Law</i>	3 (3 + 0)
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Prasyarat : Tiada
Kursus ini merangkumi undang-undang yang berkaitan dengan penubuhan dan pengoperasian institusi perkhidmatan makanan. Akta dan peraturan makanan yang berkaitan turut dibincangkan.

This course covers the laws pertaining to the formation and operations of foodservice institutions. The related food acts and regulations are also discussed.

FSM4804	Kontrak Dan Francais Dalam Perkhidmatan Makanan <i>/Contract And Franchise In Foodservice</i>	3 (3 + 0)
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Prasyarat : Tiada
Kursus ini merangkumi asas dan prinsip pembangunan kontrak dan francais. Pembangunan dan penilaian kontrak di dalam organisasi perkhidmatan makanan turut diberi penekanan.

This course covers the basic and principles of contract and franchise development. The development and evaluation of a contract in the foodservice organization are also emphasized.

FSM4901	Latihan Industri/ <i>Industrial Training</i>	12 (0 + 12)
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Prasyarat : Pelajar Semester 6 BS(PPM) – Lengkap 100 jam khidmat

Kursus ini memberi peluang kepada pelajar untuk menilai teknologi yang digunakan dalam industri makanan dan menimba pengalaman kerja dalam persekitaran industri berkenaan. Latihan dijalankan di agensi kerajaan atau swasta selama 24 minggu untuk pendedahan kepada perancangan dan penyelarasan kerja di bawah penyeliaan pegawai tempat latihan industri yang dilantik.

This course provides students with the opportunity to evaluate the technologies used in the food industry and gain experience working in an environment in the industry. The training is carried out over a period of 24 weeks at government or private agencies for exposure on work planning and coordination under the supervision of an appointed officer of the agency.

FSM4977	Seminar/Seminar	1 (0 + 1)
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Prasyarat : Pelajar Semester 8 BS(PPM)

Kursus ini merangkumi persediaan dan teknik pembentangan berkesan. Pelajar perlu membentang penemuan projek penyelidikan yang telah dijalankan.

This course covers the preparation and techniques of effective presentation. Students are required to present the findings of their research project.

FSM4999A	Projek Ilmiah Tahun Akhir I/ <i>Final Year Project I</i>	3 (0 + 3)
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Prasyarat : Pelajar Semester 6 BS(PMK) dan 7 BS(PPM)

Kursus ini merangkumi pelaksanaan projek penyelidikan dan teknik penulisan saintifik. Pelajar perlu menghasilkan penulisan ilmiah secara sistematik.

The course covers the implementation of research project and scientific writing techniques. Students are required to produce a systematic academic write-up.

FSM4999B Projek Ilmiah Tahun Akhir II/ *Final Year Project II* 3 (0 + 3)

Prasyarat : Pelajar Semester 7 BS(PMK) dan 8 BS(PPM)

Kursus ini merangkumi pelaksanaan projek penyelidikan dan teknik penulisan saintifik. Pelajar perlu menghasilkan penulisan ilmiah secara sistematik.

The course covers the implementation of research project and scientific writing techniques. Students are required to produce a systematic academic write-up.

KURSUS TAWARAN FAKULTI LAIN/ COURSES OFFERED BY OTHER FACULTIES

(Sila rujuk sinopsis pada fakulti berkenaan/ Please refer to course synopsis from the respective faculties)

1. FAKULTI EKOLOGI MANUSIA/ FACULTY OF HUMAN ECOLOGY

1.1	SKP2101	Kenegaraan Malaysia/ <i>Malaysian Nationhood</i>	3 (3+0)
1.2	SKP2203	Tamadun Islam dan Tamadun Asia/ <i>Asian and Islamic Civilization</i>	2 (2+0)
1.3	SKP2204	Hubungan Etnik / <i>Ethnic Relation</i>	2 (2+0)

2. FAKULTI PERTANIAN/ FACULTY OF AGRICULTURE

2.1	PRT2008	Pertanian dan Manusia/ <i>Agriculture and Man</i>	2 (2+0)
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3. PUSAT PEMAJUAN KOMPETENSI BAHASA/ CENTRE FOR THE ADVANCEMENT OF LANGUAGE COMPETENCE (CALC)

3.1	BBI2422	<i>Reading for Academic Purposes</i>	3 (2+1)
3.2	BBI2423	<i>Academic Interaction and Presentation</i>	3 (2+1)
3.3	BBI2424	<i>Academic Writing</i>	3 (2+1)
3.4	BBI2412	<i>Writing for Academic Purposes</i>	3 (2+1)

4. FAKULTI BAHASA MODEN DAN KOMUNIKASI/ FACULTY OF MODERN LANGUAGES AND COMMUNICATION

4.1	BB_XXXX	Bahasa Global/ <i>Global Language</i>	3 (2+1)
4.2	BB_2401	Bahasa Asing I/ <i>Foreign Language I</i>	3 (2+1)
4.3	BB_2402	Bahasa Asing II/ <i>Foreign Language II</i>	3 (2+1)
4.4	BB_2403	Bahasa Asing III/ <i>Foreign Language III</i>	3 (2+1)

5. FAKULTI EKONOMI DAN PENGURUSAN/ FACULTY OF ECONOMY AND MANAGEMENT

5.1	MGM3101	Prinsip Pengurusan/ <i>Principles of Management</i>	3 (2+1)
5.2	MGM3113	Gelagat Organisasi/ <i>Organizational Behavior</i>	3 (3+0)
5.3	MGM3180	Asas Keusahawanan/ <i>Basic Entrepreneurship</i>	3 (2+1)
5.4	MGM3211	Prinsip Pemasaran/ <i>Principles of Marketing</i>	3 (3+0)
5.5	MGM3244	Gelagat Pengguna/ <i>Consumer Behavior</i>	3 (3+0)
5.6	MGM4154	Pengurusan Perdagangan Antarabangsa/ <i>International Business Management</i>	3 (3+0)
5.7	MGM4183	Keusahawanan/ <i>Entrepreneurship</i>	3 (3+0)
5.8	MGM4204	Pemasaran Perkhidmatan/ <i>Services Marketing</i>	3 (3+0)
5.9	MGM4219	Pengurusan dan Strategi Pemasaran/ <i>Marketing Strategy</i>	3 (3+0)

add Management

5.10	MGM4224	Pemasaran Langsung/ <i>Direct Marketing</i>	3 (3+0)
5.11	MGM4264	Penyelidikan Pemasaran/ <i>Marketing Research</i>	3 (3+0)
5.12	MGM4273	Pemasaran Antarabangsa/ <i>International Marketing</i>	3 (3+0)
5.13	MGM4284	Pengurusan Promosi/ <i>Promotion Management</i>	3 (3+0)
5.14	ACT2112	Perakaunan Pengenalan/ <i>Introductory Accounting</i>	4 (3+1)
5.15	ACT2131	Perakaunan Kos dan Pengurusan/ <i>Cost and Management Accounting</i>	3 (3+0)
5.16	ACT3211	Pengurusan Kewangan/ <i>Financial Management</i>	3 (3+0)
5.17	ECN3100	Prinsip Ekonomi/ <i>Principles of Economics</i>	3 (3+0)
5.18	ECN3101	Mikroekonomi/ <i>Microeconomics</i>	3 (3+0)
5.19	ECN3102	Makroekonomi/ <i>Macroeconomics</i>	3 (3+0)

6. FAKULTI SAINS/ *FACULTY OF SCIENCE*

6.1	CHM3010	Kimia Fizik dan Tak Organik/ <i>Physical and Inorganic Chemistry</i>	4 (3+1)
6.2	CHM3201	Kimia Organik 1/ <i>Organic Chemistry I</i>	4 (3+1)
6.3	CHM3401	Kimia Analisis/ <i>Analytical Chemistry</i>	3 (2+1)
6.4	MTH3002	Pengenalan Kepada Kalkulus/ <i>Introduction to Calculus</i>	4 (3+1)
6.5	MTH3003	Statistik Bagi Sains Gunaan/ <i>Statistics for Applied Sciences</i>	4 (3+1)



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