

**Bachelor Sains Operasi
Pembuatan Makanan dengan
Kepujian**

***Bachelor of Science in Food
Manufacturing Operations with
Honours***

STRUKTUR KURIKULUM/ CURRICULUM STRUCTURE

Nama Program	:	Bachelor Sains Operasi Pembuatan Makanan dengan Keahlian/ <i>Bachelor of Science in Food Manufacturing Operations with Honours</i>
Jumlah Kredit Bergraduat	:	131 Jam Kredit/ <i>Credit Hours</i>
Tempoh Pengajian	:	8 Semester/ <i>Semesters (4 Tahun/ Years)</i>
Matlamat Program	:	<ol style="list-style-type: none"> 1. Melahirkan profesional yang berpengetahuan dan berkemahiran teknikal dalam bidang operasi pembuatan makanan serta berkebolehan menyelesaikan masalah bidang operasi pembuatan makanan secara inovatif, kreatif dan beretika. 2. Melahirkan profesional yang mampu berkomunikasi dan menunjukkan keupayaan pengendalian operasi pembuatan makanan serta mempunyai ciri keusahawanan dalam bidang yang diceburi. 3. Melahirkan profesional yang mampu menjalankan penyelidikan dan pembangunan dalam bidang operasi pembuatan makanan.

Ringkasan Hasil Pembelajaran Program

Program	Pengetahuan dan Kefahaman	Kemahiran Praktikal	Kemahiran Kognitif	Kemahiran Komunikasi	Kemahiran Interpersonal	Etika dan Profesionalisme	Kemahiran Digital	Kemahiran Personal dan Keusahawanan	Kemahiran Kepimpinan, Autonomi dan Tanggungjawab	Kemahiran Numerasi
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
Bachelor Sains Operasi Pembuatan Makanan	36	22	24	12	13	17	9	7	4	4

1. Kursus Universiti/ *University Courses (25 Kredit/ 25 Credits)*

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T	PRASYARAT/ PREREQUISITE	(√) Jika lulus/ if passed
LPE2403	Interaksi dan Pembentangan Akademik/ <i>Academic Interaction and Presentation</i>	3	3	0	LPE2302 atau MUET Band 3 & 4	
LPE2503	Penulisan Akademik / <i>Academic Writing</i>	3	3	0	LPE2403	
FCE3204	Kemahiran Berfikir / <i>Thinking Skills</i>	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	
PRT2009	Pertanian dan Kehidupan / <i>Agriculture and Life</i>	2	1	1	Tiada/None	
SKP2101*	Kenegaraan Malaysia/ <i>Malaysian Nationhood</i>	3	3	0	Tiada/ None	
FEM2401**	Politik Malaysia Dan Masyarakat/ <i>Malaysian Politics and Society</i>	2	2	0		
SKP3112*	Falsafah dan Isu Semasa/ <i>Philosophy and Current Issues</i>	2	2	0	Tiada/ None	
SKP3113**	Falsafah dan Isu Semasa Masyarakat Sipil/ <i>Philosophy and Current Issues in Civil Society</i>	3	3	0		
atau/ or SKP3123**	Penghayatan Etika dan Peradaban di Malaysia/ <i>Internalization of Ethics and Civilization in Malaysia</i>					
SKP3122*	Penghayatan Etika dan Peradaban/ <i>Internalization of Ethics and Civilization</i>	2	2	0	Tiada/ None	
LPM2100**	Bahasa Melayu Komunikasi/ <i>Malay Language Communication</i>	2	2	0	Tiada / None	
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	
FEM2313	Integriti dan Anti Rasuah/Integrity and Anti-Corruption	1	0	1	Tiada/ None	

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

2. Kursus Teras di Universiti/ *Core Courses in University* (80 Kredit/ 80 Credits)

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T	PRASYARAT/ PREREQUISITE	(√) Jika lulus/ if passed
ACN3102	Perakaunan Pengenalan/ <i>Introductory Accounting</i>	4	3	1	Tiada/ None	
LP_2101	Bahasa Global Asas I/ <i>Basic Global Language I</i>	3	3	0	Tiada/ None	
CHY3201	Kimia Organik 1/ <i>Organic Chemistry 1</i>	4	3	1	CHY2001*	
FMO3001	Pengenalan kepada Pembuatan Makanan/ <i>Introduction to Food Manufacturing</i>	2	2	0	Tiada/ None	

FMO3101	Perubahan Nutrien dalam Pembuatan Makanan/ <i>Nutrient Changes in Food Manufacturing</i>	3	3	0	Tiada/ None	
FMO3203	Mikrobiologi dan Sanitasi dalam Pemprosesan Makanan/ <i>Microbiology and Sanitation in Food Processing</i>	3	3	0	Tiada/ None	
FMO3402	Operasi Unit dalam Pembuatan Makanan/ <i>Unit Operations in Food Manufacturing</i>	3	2	1	FST3401	
FMO3801	Pemprosesan dan Pengawetan Makanan/ <i>Food Processing and Preservation</i>	3	2	1	Tiada/ None	
FMO4301	Pembuatan dan Pengkomersilan Produk Makanan Baharu/ <i>Manufacturing and Commercialization of New Food Products</i>	3	1	2	FMO4801 atau FMO4802	
FMO4501	Perundangan dalam Operasi Pembuatan Makanan/ <i>Laws in Food Manufacturing Operations</i>	2	2	0	Tiada/ None	
FMO4601	Analisis Produk Makanan/ <i>Analysis of Food Products</i>	3	2	1	Tiada/ None	
FMO4602	Kualiti dan Piawaian dalam Industri Pembuatan Makanan/ <i>Quality and Standards in Food Manufacturing Industry</i>	3	3	0	Tiada/ None	
FMO4701	Pengurusan Rangkaian Bekalan Makanan/ <i>Food Supply Chain Management</i>	3	3	0	MGM3101	
FMO4801	Pembuatan Hasil Tumbuhan/ <i>Manufacturing of Plant Products</i>	3	2	1	FMO3801	
FMO4802	Pembuatan Hasil Haiwan/ <i>Manufacturing of Animal Products</i>	3	2	1	FMO3801	
FMO4959	Disertasi Bachelo/ <i>Bachelor Dissertation</i>	6	0	6	Tiada/ None	
FST3111	Kimia Komponen Makanan/ <i>Chemistry of Food Components</i>	3	3	0	Tiada/ None	
FST3401	Asas Kejuruteraan Makanan/ <i>Fundamentals of Food Engineering</i>	3	2	1	Tiada/ None	
FST3602	Makanan Halal/ <i>Halal Food</i>	2	2	0	Tiada/ None	
FST4407	Pengurusan Operasi Loji Makanan/ <i>Operational Management of Food Plant</i>	3	3	0	FST3405 atau FMO3402	
FST4408	Pembungkusan Makanan/ <i>Food Packaging</i>	3	2	1	FST3302 atau FMO3801	
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 atau FMO3801	
MGM3113	Gelagat Organisasi/ <i>Organizational Behavior</i>	3	3	0	MGM3101	
MGM3211	Prinsip Pemasaran/ <i>Principles of Marketing</i>	3	3	0	Tiada/ None	

MTH3003	Statistik Bagi Sains Gunaan/ <i>Statistics for Applied Sciences</i>	4	3	1	Tiada/ <i>None</i>	
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*Pengecualian daripada kursus CHY2001 (Kimia Am) diberi kepada pelajar yang memperoleh C+ ke atas bagi kimia peringkat diploma, matrikulasi, asasi dan STPM tetapi **pelajar perlu mengisi borang pengecualian atas talian.**/**Exemption from CHY2001 (General Chemistry) course is given to students who obtained C+ and above for their diploma, matriculation, foundation, and STPM level chemistry but **students are required to fill in the online exemption form.***

3. Kursus Teras di Industri/ *Core Courses in Industry (26 Kredit/ 26 Credits)*

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T	PRASYARAT/ PREREQUISITE	(√) Jika lulus/ if passed
FMO4901	Latihan Industri/ <i>Industrial Training</i>	12	0	12	Tiada/ <i>None</i>	
FMO4902	Operasi Industri Pembuatan Makanan/ <i>Operations in Food Manufacturing Industry</i>	14	0	14	Tiada/ <i>None</i>	

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

SKEMA PENGAJIAN BACELOR SAINS OPERASI PEMBUATAN MAKANAN DENGAN KEPUJIAN/ *STUDY SCHEME FOR BACHELOR OF SCIENCE IN FOOD MANUFACTURING OPERATIONS WITH HONOURS*

TAHUN 1/ *1ST 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
FMO3001	Pengenalan kepada Pembuatan Makanan/ <i>Introduction to Food Manufacturing</i>	2	2	0
MGM3101	Prinsip Pengurusan/ <i>Principles of Management</i>	3	3	0
MGM3180	Asas Keusahawanan/ <i>Basic Entrepreneurship</i>	3	2	1
PRT2009	Pertanian dan Kehidupan/ <i>Agriculture dan Life</i>	2	1	1
SKP2101*	Kenegaraan Malaysia/ <i>Malaysian Nationhood</i> Politik Malaysia Dan Masyarakat/ <i>Malaysian</i> <i>Politics and Society</i>	3	3	0
FEM2401**		2	2	0
QK_XXXX	Ko-kurikulum I/ <i>Co-curriculum I</i>	1	0	1
**FEM2313	Integriti dan Anti Rasuah/Integrity and Anti- Corruption <i>LAX (6 points)</i>	1	0	1
JUMLAH/ TOTAL		19	14	5

**FEM2313 (Integriti dan Anti Rasuah/Integrity and Anti-Corruption) diambil oleh pelajar antarabangsa/ *international student* pada semester 1

SEMESTER 2/ 2ND SEMESTER

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
LPE2403	Interaksi dan Pembentangan Akademik/ <i>Academic Interaction and Presentation</i>	3	3	0
FCE3204	Kemahiran Berfikir/ <i>Thinking Skills</i>	2	2	0
FST3401	Asas Kejuruteraan Makanan/ <i>Fundamentals of Food Engineering</i>	3	2	1
CHY3201	Kimia Organik 1/ <i>Organic Chemistry 1</i>	4	3	1
SKP3112*	Falsafah dan Isu Semasa/ <i>Philosophy and Current Issues</i>	2	2	0
SKP3113** atau/ or SKP3123**	Falsafah dan Isu Semasa Masyarakat Sivil/ <i>Philosophy and Current Issues in Civil Society</i> atau/ or Penghayatan Etika dan Peradaban di Malaysia/ <i>Internalization of Ethics and Civilization in Malaysia</i>	3	3	0
SKP3122*	Penghayatan Etika dan Peradaban/ <i>Internalization of Ethics and Civilization</i>	2	2	0
LPM2100**	Bahasa Melayu Komunikasi/ <i>Malay Language Communication</i>	2	2	0
FMO3101	Perubahan Nutrien dalam Pembuatan Makanan/ <i>Nutrient Changes in Foods Manufacturing</i>	3	3	0
QK_XXXX	Ko-kurikulum II/ <i>Co-curriculum II</i>	1	0	1
*FEM2313	Integriti dan Anti Rasuah/Integrity and Anti-Corruption	1	0	1
JUMLAH/ TOTAL		21	17	4

*FEM2313 (Integriti dan Anti Rasuah/Integrity and Anti-Corruption) diambil oleh pelajar tempatan/ local student pada semester 2

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

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
ACN3102	Perakaunan Pengenalan/ <i>Introductory Accounting</i>	3	3	0
FMO3203	Mikrobiologi dan Sanitasi dalam Pemprosesan Makanan/ <i>Microbiology and Sanitation in Food Processing</i>	3	3	0
FMO3801	Pemprosesan dan Pengawetan Makanan/ <i>Food Processing and Preservation</i>	3	2	1
FMO4601	Analisis Produk Makanan/ <i>Analysis of Food Products</i>	3	2	1
FST3111	Kimia Komponen Makanan/ <i>Chemistry of Food Components</i>	3	3	0
LPE2503	Penulisan Akademik/ <i>Academic Writing</i>	3	3	0
JUMLAH/ TOTAL		18	16	2

SEMESTER 2/ 2ND SEMESTER

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
FMO3402	Operasi Unit dalam Pembuatan Makanan/ <i>Unit Operations in Food Manufacturing</i>	3	2	1
FMO4501	Perundangan dalam Operasi Pembuatan Makanan/ <i>Laws in Food Manufacturing Operations</i>	2	2	0
FMO4801	Pembuatan Hasil Tumbuhan/ <i>Manufacturing of Plant Products</i>	3	2	1
FMO4802	Pembuatan Hasil Haiwan/ <i>Manufacturing of Animal Products</i>	3	2	1
FST3602	Makanan Halal/ <i>Halal Food</i>	2	2	0
FST4410	Kejuruteraan Sisa Industri Makanan/ <i>Food Industrial Waste Engineering</i>	2	2	0
MGM3211	Prinsip Pemasaran/ <i>Principles of Marketing LAX (6 Points)</i>	3	3	0
JUMLAH/ TOTAL		18	15	3

TAHUN 3/ 3RD YEARSEMESTER 1/ 1ST SEMESTER

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
LP_2101	Bahasa Global Asas I/ <i>Basic Global Language I</i>	3	3	0
FMO4301	Pembuatan dan Pengkomersilan Produk Makanan Baharu/ <i>Manufacturing and Commercialization of New Food Products</i>	3	1	2
FMO4602	Kualiti dan Piawaian dalam Pembuatan Makanan/ <i>Food Quality and Standards in Food Manufacturing Industry</i>	3	3	0
FST4411	Rekabentuk Loji Makanan/ <i>Food Plant Design</i>	3	3	0
FST4408	Pembungkusan Makanan/ <i>Food Packaging</i>	3	2	1
MGM3113	Gelagat Organisasi/ <i>Organizational Behavior CEL 2105/2106/2107</i>	3	3	0
JUMLAH/ TOTAL		18	15	3

SEMESTER 2/ 2ND SEMESTER

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
FMO4959	Disertasi Bachelo/ <i>Bachelor Disertation</i>	6	0	6
FST4407	Pengurusan Operasi Loji Makanan/ <i>Operational Management of Food Plant</i>	3	3	0
FMO4701	Pengurusan Rangkaian Bekalan Makanan/ <i>Food Supply Chain Management</i> <i>CEL 2105/2106/2107</i>	3	3	0
JUMLAH/ TOTAL		12	6	6

TAHUN 4/ 4TH YEARSEMESTER 1/ 1ST SEMESTER

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
FMO4902	Operasi Industri Pembuatan Makanan/ <i>Operations in Food Manufacturing Industry</i>	14	0	14
JUMLAH/ TOTAL		14	0	14

SEMESTER 2/ 2ND SEMESTER

KOD KURSUS/ COURSE CODE	NAMA KURSUS/ COURSE NAME	Kr	K	A/T
FMO4901	Latihan Industri/ <i>Industrial Training</i>	12	0	12
JUMLAH/ TOTAL		12	0	12

SINOPSIS KURSUS/ COURSE SYNOPSIS

Jabatan Sains Makanan/ Department of Food Science

- FST3110 Biokimia Makanan/ *Food Biochemistry* 3 (3 + 0)
Prasyarat: Tiada/ *None*
Kursus ini merangkumi prinsip dan proses biokimia yang berlaku dalam sistem hidupan dan makanan. Penekanan kursus ini meliputi air dan sistem penimbal, pemangkinan berenzim, bioenergetik, laluan metabolik biomolekul utama, fotosintesis, dan proses transkripsi dan translasi. Hubungan kait proses biokimia dengan penghasilan makanan dibincangkan.
This course covers the principles of biochemistry and biochemical processes occurring in living and food systems. This course emphasises water and buffer systems, enzyme catalysis, bioenergetics, metabolic pathways of major biomolecules, photosynthesis, transcription and translation processes. The relationships of biochemical processes and food production are discussed.
- FST3111 Kimia Komponen Makanan/ *Chemistry of Food Components* 3 (3 + 0)
Prasyarat: Tiada/ *None*
Kursus ini merangkumi sifat fizikokimia dan kefungsiannya komponen makro dan mikro makanan khususnya air, karbohidrat, serat dietari, protein dan enzim, lipid, vitamin, mineral, perisa, pigmen, bahan toksik semulajadi, bahan cemar, dan aditif makanan. Peranan komponen dan interaksi dalam sistem makanan dibincangkan.
This course covers the physicochemical and functional properties of food macro- and micro-components specifically water, carbohydrates, dietary fibres, proteins and enzymes, lipids, vitamins, minerals, flavours, pigments, natural toxicants, contaminants and food additives. The roles of the components and their interactions in food systems are discussed.
- FST3113 Perubahan Pemakanan dalam Makanan/ *Nutritional Changes in Foods* 3 (3 + 0)
Prasyarat: Tiada/ *None*
Kursus ini meliputi sumbangan dan kepentingan nutrien ke atas kesihatan, pemakanan untuk golongan tertentu dan penilaian status pemakanan. Perubahan kualiti nutrien semasa pemrosesan 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 fizikokimia komponen makro makanan. Perkaitan di antara sifat fizikokimia dan kefungsiannya komponen makro berkenaan dalam makanan dibincangkan. Aplikasi teknik kimia dan instrumentasi menggunakan kaedah rujukan dalam analisis komponen makro makanan diberi penekanan.
This course covers the physicochemical properties of macro components. The relationship between physicochemical and functional properties of these macro-components in foods are discussed. Application of chemical and instrumental techniques with reference methods in the analysis of food macro-components is emphasised.
- FST3115 Kimia dan Analisis Komponen Mikro Makanan/ *Chemistry and Analysis of Food Micro-Components* 3 (2 + 1)
Prasyarat: FST3110
Kursus ini meliputi sifat fizikokimia komponen mikro makanan. Perkaitan di antara sifat fizikokimia dan kefungsiannya komponen mikro berkenaan dalam makanan diberi penekanan. Aplikasi kaedah utama yang digunakan dalam analisis komponen mikro makanan turut dibincangkan.
This course covers the physicochemical properties of micro-components of food. The relationship between the physicochemical and their functional properties in foods is emphasised. Application of

the main methods in the analysis of food micro-components is discussed.

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

Prasyarat: Tiada/ *None*

Kursus ini meliputi pengenalan kepada mikrobiologi dan teknik asas yang digunakan di makmal. Penekanan diberi kepada sifat dan pengelasan mikroorganisma, taksonomi dan penamaan, dan struktur dan fungsi sel prokariot dan eukariot. Pengkulturan dan pemeliharaan mikroorganisma, pembiakan dan tumbesaran, metabolisme dan biosintesis, kawalan tumbesaran mikroorganisma, genetik mikroorganisma, dan mikroorganisma bawaan makanan yang penting dibincangkan

This course covers the introduction to microbiology and basic techniques used in the laboratory. Emphasis is given to microbial characteristics and classification, taxonomy and nomenclature, and structures and functions of prokaryotes and eukaryotes. Cultivation and maintenance of cultures, reproduction and growth, metabolism and biosynthesis, control of microbial growth, microbial genetics, and important foodborne microorganisms are discussed

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

Prasyarat: FST3201

Kursus ini meliputi peranan dan kepentingan mikroorganisma dalam makanan. Penekanan diberi kepada kaedah pengawalan tumbesaran mikroorganisma melalui pemprosesan dan pengawetan makanan. Cabaran baharu seperti kerintangan mikroorganisma terhadap antibiotik dibincangkan.

This course covers the role and importance of microorganisms in food. Emphasis is given to methods of controlling the growth of microorganisms through food processing and preservation. New challenges such as the resistance of microorganisms against antibiotics are discussed

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

Prasyarat: FST3202

Kursus ini merangkumi prinsip kebersihan dan sanitasi dalam rantai bekalan makanan daripada penyimpanan bahan mentah, pemprosesan, pengedaran, hingga kepada pengguna. Hubungan kait antara pencemaran mikroorganisma dan pemprosesan makanan dibincangkan. Teknologi pembersihan, kualiti air, pengendalian sisa produk, kawalan perosak dan reka bentuk sanitasi dalam pemprosesan makanan ditekankan.

This course covers the principles of hygiene and sanitation in the food supply chain from raw material storage, processing, distribution to the consumer. The relationship between microorganism contamination and food processing is discussed. Cleaning technology, water quality, product waste management, pest control and sanitation design in food processing are emphasized.

FST3702 Makanan dan Kesihatan/ *Food and Health* 3 (3 + 0)

Prasyarat: Tiada/ *None*

Kursus ini merangkumi sumbangan dan kepentingan nutrien serta kaitannya dengan kesihatan dalam setiap peringkat kitaran hidup manusia. Penekanan diberi kepada peranan diet untuk kesihatan optimum termasuk meningkatkan fungsi imun, pengurusan stres dan pencegahan penyakit kronik. Isu semasa berkaitan pemakanan dibincangkan.

This course covers contribution and significance of nutrients on health at each stage of lifecycle. Emphasis is given to the roles of diet for optimum health including for the improvement of immune functions, stress management and prevention of chronic diseases. Current issues related to nutrition are discussed.

FST4110 Makanan Masa Hadapan/ *Future Foods* 3 (3 + 0)

Prasyarat: FST3110

Kursus ini merangkumi konsep dan pembangunan makanan masa hadapan serta kaitannya dengan keperluan dan permintaan semasa. Penekanan diberikan kepada reka bentuk pelbagai jenis makanan masa hadapan dengan menggunakan sumber baharu dan kaedah terkini. Kelestarian alam sekitar dalam pembuatan makanan masa hadapan menggunakan teknologi termaju dibincangkan.

This course covers the concept and development of future food and its relation to the needs and current demand. Emphasis is given on the design of a wide variety of future foods using new sources

and the latest methods. Environmental sustainability in future food manufacturing using advanced technology is discussed.

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

Prasyarat: FST3202

Kursus ini meliputi pengetahuan asas dan organisasi genetik mikroorganisma serta organisma peringkat tinggi. Prinsip dan aplikasi teknologi molekular, immunoasai, dan biosensor dalam kaedah pantas untuk diagnostik makanan dibincangkan.

This course covers basic knowledge and genetic organization of microorganisms and high level organisms. The principles and applications of molecular, immunoassay, and biosensor technologies in rapid methods for food diagnostics are discussed.

FST4504 Mikrobiologi Industri Makanan/ *Industrial Food Microbiology* 4 (3 + 1)

Prasyarat: FST3201

Kursus ini meliputi prinsip fermentasi dan kegunaan mikroorganisma dalam industri makanan. Topik meliputi industri makanan, pasaran tempatan dan global, jenis fermentasi, kultur pemula, industri makanan terfermentasi dan perkembangan, ramuan makanan yang dihasilkan melalui teknologi fermentasi dan perubahan tekstur dan perisa semasa penuaan dan pematangan

This course covers the principles of fermentation and use of microorganisms in food industry. Topics covered will be food industry local and global market, types of fermentation, fermentation process, starter cultures, fermented foods and development of the industry, food ingredients produced by fermentation technology and textural and flavour changes during ageing and maturity

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

Prasyarat: Tiada/ *None*

Kursus ini meliputi trend penggunaan, sumber dan aplikasi enzim dalam industri makanan. Prinsip, jenis dan penggunaan mikroorganisma dalam industri makanan terfermentasi dibincangkan. Isu terkini penggunaan enzim dan proses fermentasi dalam pelbagai industri makanan ditekankan.

This course covers usage trends, sources, and application of enzymes in the food industry. The principles, types and the use of microorganisms in fermented food industry are discussed. Current issues in the use of enzymes and fermentation processes in various food industries are emphasised.

FST4611 Keselamatan Kimia Makanan/ *Food Chemical Safety* 3 (3 + 0)

Prasyarat: FST3110

Kursus ini merangkumi konsep dan ciri keselamatan kimia makanan termasuk prinsip toksikologi dan perundangan. Kejadian bahan toksik semulajadi dan yang terhasil daripada pemprosesan makanan dan amalan manusia, serta bahan tambah dalam makanan dihuraikan. Kaedah penilaian keselamatan makanan dan isu semasa dibincangkan.

This course covers the concepts and characteristics of chemical food safety including principles of toxicology and legislation. The incidence of natural contaminants and contaminants resulting from the processing of food and human practices, as well as additive substances in food are described. Food safety assessment methods and current issues are discussed.

FST4612 Pengurusan Kualiti Makanan/ *Food Quality Management* 3 (3 + 0)

Prasyarat: FST4611

Kursus ini merangkumi konsep kualiti dan aplikasi Sistem Pengurusan Keselamatan Makanan, Sistem Pengurusan Kualiti Makanan, dan Pengurusan Kualiti Menyeluruh oleh industri makanan. Konsep dan aplikasi pelan pensampelan dan kawalan kualiti melalui analisis statistik diberi penekanan. Permasalahan pengurusan kualiti makanan dan cadangan penyelesaian bagi meningkatkan kualiti makanan dibincangkan.

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. Concept and application of sampling plan and quality control through statistical analysis are emphasized. Issues of food quality management and proposed solutions for improving the quality of food are discussed.

- FST4705 Makanan Fungsian/ *Functional Food* 3 (3 + 0)
 Prasyarat: FST3115
 Kursus ini meliputi sebatian bioaktif dalam makanan, kebaikannya kepada kesihatan dan mekanisme yang dicadangkan. Pelbagai sebatian bioaktif dan hubung kait dengan aktiviti biologi, teknologi penghasilan dan operasi pasca pemprosesan ramuan makanan fungsian ditekankan. Kesan pemprosesan terhadap keberkesanan dan kebolehdapatan bio, kawalan kualiti dan piawaian, isu keselamatan dan status peraturan makanan dibincangkan.
The course covers bioactive compounds in food, its benefits to health, and proposed mechanisms. Various bioactive compounds and their correlations with biological activities, production technologies, and post-processing operations of functional food ingredients are emphasized. The effect of processing on bioavailability, quality control and standards, safety issues, and food regulatory status are discussed.
- 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/ *None*
 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 dan Sayuran/ *Postharvest Handling of Fruits and Vegetables* 3 (2 + 1)
 Prasyarat: FST4830
 Kursus ini merangkumi perubahan biokimia dan sifat fizikal lepas tuai buah dan sayuran. Penekanan diberi kepada aktiviti pengendalian lepas tuai, kriteria kualiti, indeks kematangan, kaedah rawatan semasa pemprosesan, pembaziran lepastuai dan gangguan fisiologi semasa penstoran. Kesan penggunaan teknologi Revolusi Perindustrian Keempat (IR4.0) ke atas kualiti dalam rantaian bekalan untuk penghasilan buah dan sayuran dibincangkan.
This course covers the biochemical changes and physical properties of postharvest fruits and vegetables. Emphasis is given on the postharvest handling activities, quality criteria, maturity index, treatment methods during processing, postharvest losses and physiological disorder during storage. The impact of the use of Fourth Industrial Revolution (4IR) technology on quality in supply chain for fruit and vegetable production is discussed.
- FST4959 Disertasi Bachelo/ *Bachelor Dissertation* 6 (0 + 6)
 Prasyarat: Pelajar Semester 6 (FST4959A) dan Semester 7 (FST 4959B) BSTM
 Kursus ini merangkumi penyediaan cadangan, pelaksanaan dan penulisan saintifik untuk sesuatu projek penyelidikan. Pendekatan saintifik bagi menjana data secara sistematik melalui reka bentuk, pengumpulan dan analisis data yang sesuai diberikan penekanan
This course covers the preparation of proposal, implementation, and scientific writing of research project. Scientific approach to generate data systematically through appropriate design, data collection and analysis are emphasised.
- FSM3101 Kimia dan Fungsi Ramuan Makanan/ *Chemistry and Functionality of Food Ingredients* 3 (2 + 1)
 Prasyarat: Tiada/ *None*

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.

FSM3207 Kimia dan Sifat Kefungsian Ramuan Makanan/ *Chemistry and Functional Properties of Food Ingredients* 3 (2 + 1)

Prasyarat: Tiada/ *None*

Kursus ini merangkumi sifat kimia dan kefungsiian komponen makanan dalam pemilihan ramuan makanan. Kepentingan fungsi ramuan dalam penyediaan makanan serta kesannya ke atas kualiti makanan turut dibincangkan.

This course covers the chemical properties and functionality of food components in the selection of food ingredients. The importance of ingredient functionality in food preparation and its impact on food quality are also discussed.

FSM3208 Pemakanan Dalam Perkhidmatan Makanan/ *Nutrition in Foodservice* 2 (2 + 0)

Prasyarat: Tiada/ *None*

Kursus ini meliputi asas pemakanan dan kaitannya dengan penyediaan makanan seimbang, serta pengiraan nilai pemakanan bagi sesuatu menu. Panduan pemakanan, makro dan mikronutrien dalam makanan; metabolisme nutrien dalam tubuh manusia dan kesan diet terhadap status pemakanan dan kesihatan ditekankan. Kesan penyediaan dan teknik memasak ke atas perubahan nutrien dalam makanan turut dibincangkan.

This course covers basic nutrition and its relationship with balanced food preparation, and calculation of nutritional value for a menu. Nutritional guide, macro- and micro-nutrients in food; the metabolism of nutrients in the human body and the effect of diet on nutritional status and health are emphasized. The effect of food preparation and cooking techniques on the changes in food nutrients are also discussed.

FSM3209 Mikrobiologi Dalam Perkhidmatan Makanan/ *Microbiology in Foodservice* 3 (2 + 1)

Prasyarat: Tiada / *None*

Kursus ini merangkumi prinsip mikrobiologi dan kepentingan mikroorganisma dalam industri perkhidmatan makanan. Mikroorganisma berkaitan kepentingan kesihatan awam; mikroorganisma bermanfaat, mikrobiologi pengawetan makanan, kaedah pemeriksaan mikrobiologi makanan dan kawalan kualiti mikrobiologi dalam operasi perkhidmatan makanan juga diketengahkan.

This course covers the principles of microbiology and the importance of microorganisms in the food service industry. Microorganisms of public health significance, beneficial microorganisms, microbiology of food preservation, methods for the microbiological examination of foods and microbiological quality control in food service operations are also highlighted).

FSM4208 Kebersihan dan Sanitasi Dalam Perkhidmatan Makanan/ *Hygiene and Sanitation in Foodservice* 3 (3 + 0)

Prasyarat: FSM3209

Kursus ini merangkumi kepentingan sanitasi dan kebersihan dalam operasi perkhidmatan makanan. Prinsip kebersihan dan sanitasi termasuk penyakit bawaan makanan, kebersihan diri, pembersihan dan sanitasi, kawalan proses, reka bentuk sanitasi dan pengurusan makhluk perosak diberi penekanan. Aplikasi sistem pengurusan keselamatan makanan juga dibincangkan.

This course covers the importance of sanitation and hygiene in food service operations. The principles of hygiene and sanitation including food-borne illness, personal hygiene, cleaning and sanitization, process control, sanitary design and pest management are emphasized. Application of food safety management system is also discussed.

FSM4901 Latihan Industri/ *Industrial Training* 12 (0 + 12)

Prasyarat: FST4959

Kursus ini memberi peluang kepada pelajar untuk menilai teknologi yang digunakan dalam industri

makanan dan menimba pengalaman kerja dalam persekitaran industri berkenaan. Penekanan diberi 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. Emphasis is given on work planning and coordination under the supervision of an appointed officer of the agency

FMP4101 Aditif Makanan/ *Food Additives* 3 (3 + 0)

Prasyarat: Tiada/ *None*

Kursus ini merangkumi klasifikasi aditif makanan berdasarkan sistem E-number dan *Generally Recognized As Safe (GRAS)*. Jenis, fungsi dan aplikasi pelbagai aditif dalam produk makanan, serta isu berkaitan penggunaan aditif makanan dari segi perundangan, impak kesihatan dan status halal juga dibincangkan.

This course covers classification of food additives based on E-number and Generally Recognized As Safe (GRAS). Types, functions and applications of various additives in food products, and issues related to applications of additives in terms of food law, impact on health and halal status are also discussed

FMO3101 Perubahan Nutrien dalam Pembuatan Makanan/ *Nutrient Changes In Foods Manufacturing* 3 (3+0)

Prasyarat: Tiada/ *None*

Kursus ini merangkumi fungsi dan kesan nutrien ke atas kesihatan. Perubahan nutrien semasa pembuatan makanan dibincangkan. Kaedah meminimalkan kehilangan nutrien semasa pengendalian, pembuatan dan penstoran makanan turut diberi penekanan.

This course covers functions and effects of nutrients on health. Nutrient changes during food manufacturing are discussed. Methods to minimize the loss of nutrients during handling, processing and storage of foods are also emphasized.

FMO3203 Mikrobiologi dan Sanitasi dalam Pemprosesan Makanan/ *Microbiology and Sanitation in Food Processing* 3 (3+0)

Prasyarat: Tiada/ *None*

Kursus ini merangkumi pengenalan kepada mikrobiologi asas serta prinsip kebersihan dan sanitasi dalam industri makanan. Pelbagai aspek sanitasi termasuk pengenalpastian penyakit bawaan makanan, kaedah penentuan kebersihan, teknologi pembersihan dan rekabentuk bersih juga dibincangkan.

This course covers introduction to basic food microbiology and principles of hygiene and sanitation in food industries. Various aspects of sanitation including identifying of food-borne illness, methods to determine hygiene, cleaning technology and sanitary design are also discussed.

FMO4601 Analisis Produk Makanan/ *Analysis of Food Products* 3 (2+1)

Prasyarat: Tiada/ *None*

Kursus ini merangkumi prinsip dan penggunaan kaedah fizikal, kimia, instrumentasi dan sensori bagi menilai sifat makanan. Pemilihan kaedah yang bersesuaian untuk penentuan kualiti produk makanan diberi penekanan.

This course encompasses physical, chemical, instrumental, and sensory methods for evaluation of food properties. Selection of appropriate methods for determination of quality of food products is emphasized.

Jabatan Teknologi Makanan/ Department of Food Technology

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

Prasyarat: Tiada/ *None*

Kursus ini merangkumi prinsip dan teknik konvensional dan terkini teknologi pemprosesan dan pengawetan makanan. Konsep rintangan dan kaitan antara teknik pemprosesan dan jenis kerosakan ke atas kualiti makanan ditekankan.

This course covers principles and techniques of conventional and modern food processing and preservation technologies. Hurdle concept and relationship between processing technique and types of deterioration on food quality is emphasized.

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 penurasan 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 Pemprosesan Makanan II/ *Unit Operation in Food Processing II* 3 (2 + 1)

Prasyarat: FST3401, FST3304

Kursus ini meliputi prinsip operasi unit pengawetan dalam pemprosesan makanan, teknik pengawetan seperti pemprosesan terma, pengawetan suhu rendah, pengeringan, penyejatan dan pemekatan, pemprosesan 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/ *Fundamentals of Food Engineering* 3 (2 + 1)

Prasyarat: Tiada/ *None*

Kursus ini menekankan prinsip asas kejuruteraan makanan merangkumi unit dan dimensi, kuantiti dan pengukuran, termodinamik, aliran bendalir, pemindahan haba dan jisim, dan psikrometri. Kaitan prinsip asas dengan reka bentuk proses pembuatan makanan dibincangkan.

This course emphasises on the fundamental principles of food engineering which include units and dimensions, quantities and measurement, thermodynamics, fluid flow, heat and mass transfer, and psychrometry. The relationship between the basic principles and the design of the food manufacturing process is discussed.

FST3404 Operasi Unit Pemprosesan Makanan I/ *Unit Operations in Food Processing I* 3 (2 + 1)

Prasyarat: FST3401

Kursus ini meliputi prinsip operasi unit fizikal dan sampingan dalam pemprosesan makanan. Penekanan diberikan kepada unit operasi permulaan dan perubahan. Aplikasi teknik yang berkaitan dengan makanan terproses dibincangkan.

This course covers the principles of the physical unit and ancillary operations in food processing. Emphasis is given on preliminary and conversion unit operations. Application of techniques that are associated with processed foods are discussed.

FST3405 Operasi Unit Pemrosesan Makanan II/ *Unit Operations in Food Processing II* 3(2 + 1)

Prasyarat: FST3404

Kursus ini meliputi prinsip operasi unit pengawetan dalam pemrosesan makanan dan teknik pengawetan. Penekanan diberikan kepada pemrosesan terma dan bukan terma. Aplikasi teknik yang berkaitan dengan makanan terproses dibincangkan.

This course covers the principles of food preservation unit operations in food processing and preservation techniques. Emphasis is given on thermal and non-thermal processing. Application of techniques that are associated with processed foods are discussed.

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

Prasyarat: Tiada

Kursus ini memperkenalkan prinsip makanan halal dari perspektif Islam, rantai makanan halal, pemrosesan dan penyediaan makanan halal dari ladang ke meja. Kursus juga merangkumi peraturan dan perundangan, autentikasi makanan halal, pensijilan halal, dan sistem kualiti produk halal. Isu semasa dalam industri makanan serta pasaran halal global turut dibincangkan..

This course introduces the principle of halal food from the Islamic perspective, halal food chain, halal food processing and preparation from farm to table. The course covers regulations and legislation, halal food authentication, halal certification and quality systems for halal products. Current issues in global halal food industries and market are also discussed.

FST3603 Pemrosesan Makanan Halal/ *Halal Food Processing* 3 (3 + 0)

Prasyarat: FST3302

Kursus ini membincangkan kaitan antara prinsip halal dari perspektif Islam dengan rantai makanan halal bermula dari ladang ke meja. Penekanan diberi kepada peraturan dan perundangan halal, sistem pengurusan halal dan prosedur mendapatkan pensijilan halal Malaysia. Peranan agensi kerajaan dan swasta dalam pembangunan industri halal, pemudahcaraan program audit dalaman dan autentikasi produk halal dalam industri makanan halal dibincangkan.

This course discusses relationship between principle of halal from the Islamic perspective for halal food chain from farm to table. Emphasis is given to the halal regulations and legislation, halal management system and procedure of applying Malaysia halal certification. The roles of various government and private agencies in development of halal industry, facilitation of halal internal audit program and authentication of halal products in the food industry are discussed.

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

Prasyarat: Tiada/ *None*

Kursus ini meliputi konsep makanan halal dan haram dalam Islam, sumber makanan halal dan haram, kaedah penyembelihan, konsep pemrosesan 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.

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 memberi penekanan kepada pengurusan operasi loji makanan yang merangkumi mengemudi, mereka bentuk, menyampaikan dan meningkatkan operasi. Kajian kes pengurusan operasi untuk pembuatan makanan turut dibincangkan.

This course gives emphasis on operational management of food plant which includes directing, designing, delivering and improving the food operation. Case studies of operation management on food manufacturing are also discussed

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

Prasyarat: FST3302

Kursus ini merangkumi konsep, fungsi dan penggunaan pembungkusan dalam industri makanan. Penekanan diberi kepada bahan pembungkus dan pembuatan, elemen kelestarian, kaedah ujian bahan pembungkus, kegagalan pembungkusan dan sistem pembungkusan. Aplikasi dan alatan pembungkusan serta peraturan dan undang-undang pembungkusan makanan dibincangkan.

This course covers concept, functions and usage of packaging in food industry. Emphasis is given on packaging materials and manufacturing, sustainability elements, testing methods for packaging materials, failures in food packaging and packaging systems. Packaging applications and equipments, laws and regulations on food packaging are discussed

FST4409 Pengurusan Air Dan Air Buangan Industri Makanan/ *Water and Wastewater Management in Food Industry* 2 (2 + 0)

Prasyarat: FST4611

Kursus ini merangkumi cara pengurusan dan rawatan sisa makanan di industri makanan. Penekanan diberikan terhadap teknologi rawatan sisa pepejal dan cecair pelbagai industri makanan. Kesan rawatan sisa buangan pepejal dan cecair terhadap alam sekitar dibincangkan.

This course covers water management and wastewater treatment process used by the food industry. Emphasis is given on the type of wastewater treatment and its impact on water quality. Effect of wastewater treatment on the environment is discussed

FST4410 Kejuruteraan Sisa Industri Makanan/ *Food Industry Waste Engineering* 2 (2 + 0)

Prasyarat: Tiada/ *None*

Kursus ini merangkumi cara pengurusan dan rawatan sisa makanan di industri makanan. Penekanan diberikan terhadap teknologi rawatan sisa pepejal dan cecair pelbagai industri makanan. Kesan rawatan sisa buangan pepejal dan cecair terhadap alam sekitar dibincangkan.

This course covers food waste management and treatment in the food industry. Emphasis is given on the solid and liquid waste treatment technology in various food industry. Effect of solid and liquid waste treatment on the environment are discussed

FST4411 Reka Bentuk Loji Makanan/ *Food Plant Design* 3 (3 + 0)

Prasyarat: FST3405

Kursus ini merangkumi pemilihan tapak dan susun atur dalam reka bentuk loji makanan. Penekanan diberi kepada pemilihan alatan, bahan, kawalan proses dan automasi bagi memenuhi spesifikasi dan piawaian industri makanan yang berbeza. Kebolehlaksanaan ekonomi dalam pengurusan projek, pembangunan dan reka bentuk loji makanan dibincangkan.

This course covers site and plant layout selections in food plant design. Emphasis is given on the selection of instruments, materials, process control and automation to meet the requirements and specifications of different food industries. Economic feasibility in project management, development

and food plant design are discussed

- FST4609 Perundangan Makanan/ *Food Law* 2 (2 + 0)
Prasyarat: FST4828
Kursus ini meliputi akta dan peraturan makanan di Malaysia dan antarabangsa bagi memastikan keselamatan dan kualiti makanan yang dihasilkan di industri. Penekanan diberi kepada akta dan peraturan berkaitan penghasilan makanan. Undang-undang dan keperluan antarabangsa untuk mengimport dan mengeksport makanan juga dibincangkan.
This course covers Malaysia and international food act and regulations to ensure food safety and quality in industry. Emphasis is given on the act and regulations pertaining food productions. International laws and requirements for food import and export is discussed
- FST4825 Perundangan Makanan/ *Food Law* 2 (2 + 0)
Prasyarat: Tiada/ *None*
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 Hasil Tumbuhan dan Haiwan/ *Processing of Plant and Animal Products* 4 (3 + 1)
Prasyarat: FST3111 atau/ or FSM3101 atau/ or FST3107
Kursus ini merangkumi komposisi kimia serta perubahan sifat fiziko-kimia hasil tumbuhan dan haiwan semasa pengendalian dan pemprosesan. Teknologi penghasilan dan analisis kualiti berkaitan pelbagai hasil 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
Kursus ini merangkumi prinsip, peranan, dan kepentingan pembangunan produk makanan baharu dalam industri makanan. Pembentukan dan perkembangan produk baharu meliputi penjanaan idea, pembentukan konsep, analisis pasaran, reka bentuk produk, penghasilan prototaip, ujian kualiti, kaedah pemasaran, dan pelancaran produk baharu diberi penekanan. Kaedah perancangan, pengurusan, dan penyelenggaraan projek serta langkah penyelesaian masalah berkaitan pembangunan produk baharu dibincangkan.
This course covers the principle, role and importance technique of new food product development in the food industry. The generation and development of new products including the idea generation, concepts, market analysis, product design prototype production, quality evaluation, marketing methods and product launching are emphasised. Project planning, management, and maintenance and problem-solving measures of product development are discussed
- 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 Hasil Tumbuhan/ *Processing Technology of Plant Products* 3 (2 + 1)

Prasyarat: FST3302

Kursus ini merangkumi teknologi pemprosesan produk berasaskan tumbuhan. Perubahan fizikokimia dan biokimia semasa pengendalian, pemprosesan dan penyimpanan dibincang. Penekanan diberi kepada penentuan kualiti produk makanan dan penyelesaian masalah industri yang berkaitan

This course covers the processing technology of plant-based products. Physicochemical and biochemical changes during handling, processing and storage are discussed. Emphasis is given on product quality and problems in related industry

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

Prasyarat: FST3302

Kursus ini merangkumi pengenalan kepada kepelbagaian daging, poltri, tenusu, telur dan hasil akuatik. Perubahan sifat fizikokimia dan biokimia semasa pengendalian, pemprosesan dan penyimpanan ditekankan. Teknologi pemprosesan serta analisis terkini berkaitan hasil haiwan dibincangkan.

This course covers the introduction to variety of meat, poultry, dairy, eggs and aquatic products. The physicochemical and biochemical changes during handling, processing and storage is emphasized. The processing technology with the latest analysis related to animal products are discussed

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

Prasyarat: MTH3003

Kursus ini merangkumi konsep, kepentingan, dan 52entia yang mempengaruhi penilaian deria. Pelbagai kaedah penilaian deria berdasarkan ujian analitikal dan ujian afektif, penyediaan dan persembahan sampel, format dan tatacara memperolehi data, dan teknik analisis data diberi penekanan. Kaedah pemilihan dan latihan ahli panel serta tingkahlaku pengguna dibincangkan.

This course covers the concept, importance, and factors affecting sensory evaluation. Various sensory evaluation methods based on analytical and affective tests, preparation and presentation of samples, format and techniques for obtaining data, and techniques for data analysis are emphasized. Procedure for selection and training of panel members, and consumer behavior are discussed

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

Prasyarat: FST4830

Kursus ini merangkum sifat fizikokimia dan teknologi minyak dan lemak yang meliputi komposisi dan sifat pelbagai jenis kumpulan minyak, analisis minyak dan lemak, tindakbalas kerosakan lemak dan minyak, teknologi pemprosesan dan teknologi modifikasi minyak. Pelbagai teknologi penghasilan lemak khusus dan aspek alam persekitaran terhadap pemprosesan minyak dan lemak dibincang secara menyeluruh

This course covers physicochemical properties and technology of oil and fat which includes different compositions and properties of various oils and fats, analysis of oils and fats, deteriorative reactions of oils and fats, processing technology and oil modification technology. Various manufacturing technology of specialty fats, and environmental aspects of fats and oils processing are discussed

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

Prasyarat: FST4830

Kursus ini merangkum teknologi bijirin dan kacang yang meliputi penggunaan, penghasilan dan penilaian kualiti bijirin dan kacang serta hasilnya, isu semasa dan penemuan baru. Penekanan

inovasi dan isu semasa berkaitan hasilan daging dibincangkan.

The course covers technologies in the meat industry ranging from animal slaughtering, meat processing, preservation and storage to the final product analysis. The application of the latest equipment, ingredients and formulations in the production of different meat products is emphasized. Trends, innovations and current issues related to meat products are discussed

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

Prasyarat: Tiada/ *None*

Kursus ini merangkumi 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.

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

Prasyarat: Tiada/ *None*

Kursus ini merangkumi sejarah dan perkembangan industri makanan. Prinsip sains dan teknologi dalam pemrosesan, 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.

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.

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

Prasyarat: Tiada/ *None*

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.

FSM4502 Pemasaran dan Penjualan dalam Industri Makanan/ *Marketing and Sales in Food Industry* 3 (3 + 0)

Prasyarat: Tiada/ *None*

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.

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 industri. The process of strategies development in the food manufacturing industry will be emphasized

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

Prasyarat: Tiada/ *None*

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/ *None*

Kursus ini merangkumi persediaan dan teknik pembentangan berkesan. Pelajar perlu membentangi 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.

FSM4999A Projek Ilmiah Tahun Akhir A & B / *Final Year Project A & B* 1 (0 + 1)

&
FSM4999B

Prasyarat: Tiada/ *None*

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.

FMO3001 Pengenalan Kepada Pembuatan Makanan/ *Introduction to Food Manufacturing* 2 (2+0)

Prasyarat: Tiada/ *None*

Kursus ini merangkumi pengenalan kepada industri pembuatan makanan. Komposisi, kaedah pembuatan dan faktor kerosakan makanan dihuraikan. Pembuatan produk makanan dan minuman berasaskan haiwan dan tumbuhan, piawaian dan isu keselamatan makanan ditekankan.

This course encompasses introduction to food manufacturing industry. Food composition, manufacturing techniques and factors affecting food spoilage are elaborated. Manufacturing of animal and plant-based foods and beverages, standards and issues on food safety are also emphasized.

FMO3402 Operasi Unit Dalam Pembuatan Makanan/ *Unit Operations in Food Manufacturing* 3 (2+1)

Prasyarat: FST3401

Kursus ini merangkumi pelbagai kaedah operasi unit pembuatan makanan. Prinsip penggaulan, penurasan, pengemparan, pengekstrakan dan penyemperitan dibincangkan.

This course encompasses various unit operations techniques of food manufacturing, principles of mixing, filtration, centrifugation, extraction and extrusion are discussed.

FMO3801 Pemprosesan dan Pengawetan Makanan/ *Food Processing and Preservation* 3 (2+1)

Prasyarat: Tiada/ *None*

Kursus ini merangkumi prinsip dan aplikasi pemprosesan dan pengawetan makanan. Konsep rintangan, pemprosesan suhu tinggi dan rendah, pemprosesan bukan terma, pengeringan serta pemekatan dihuraikan. Kesan pemprosesan terhadap kualiti dan kestabilan produk, pembungkusan dan aditif makanan dibincangkan

This course encompasses the principles and applications of food processing and preservation. Hurdle

concept, high- and low- temperature, non-thermal, drying and evaporation processes are described. Effects of processing on quality and stability of food products, packaging and food additives are discussed.

FMO4301 Pembuatan dan Pengkomersialan Produk Makanan Baharu/ 3 (1+2)
Manufacturing and Commercialization of New Food Products

Prasyarat: FMO4801 atau FMO4802

Kursus ini merangkumi pembuatan dan pengkomersialan produk makanan baharu. Penyelesaian masalah berkaitan pembuatan dan penghasilan produk makanan baharu diberi penekanan. Kaedah pengkomersialan produk makanan baharu turut dibincangkan

This course encompasses manufacturing and commercialisation of new food products. Problem solving concerning development of new food process and products are emphasized. Methods of commercialisation of new food products are discussed.

FMO4501 Perundangan dalam Operasi Pembuatan Makanan/ *Laws in Food* 3 (1+2)
Manufacturing Operations

Prasyarat: FMO4801 atau FMO4802

Kursus ini merangkumi pelbagai perundangan dalam operasi pembuatan makanan. Akta berkaitan dengan kilang dan jentera, pekerjaan, kesihatan dan keselamatan pekerjaan, peraturan makanan, perihal dagangan dan cap dagangan dibincangkan.

This course encompasses various laws in food manufacturing operations. Acts related to factories and machinery, employment, occupational safety and health administration, food regulations, trade descriptions and trademarks are discussed.

FMO4602 Kualiti Dan Piawaian Dalam Industri Pembuatan Makanan/ *Food* 3 (3+0)
Quality And Standards In Food Manufacturing Industry

Prasyarat: Tiada/ *None*

Kursus ini merangkumi sistem kualiti dan piawaian dalam industri pembuatan makanan. Konsep, aplikasi piawaian, amalan dalam industri pembuatan makanan, pengurusan pemeriksaan makanan dan panggil-balik juga dibincangkan.

This course encompasses quality systems and standards in food manufacturing industry. Concept, application of standards, practice in food manufacturing industry, management of food inspection and recall are also discussed.

FMO4701 Pengurusan Rantaian Bekalan Makanan/ *Food Supply Chain* 3 (3+0)
Management

Prasyarat: MGM3101

Kursus ini merangkumi pelbagai elemen utama dalam pengurusan rantaian bekalan makanan. Strategi dan kepentingan pengurusan rantaian bekalan serta pengurusan perolehan dibincangkan. Penggudangan, logistik, rantaian sejuk beku dan rantaian bekalan makanan untuk masa hadapan dihuraikan.

This course encompasses various key elements in food supply chain management. Strategy and importance of food supply chain management as well as procurement management are discussed. Warehousing, logistic, cold chain and the future of food supply chain are described.

FMO4801 Pembuatan Hasil Tumbuhan/ *Manufacturing of Plant Products* 3 (2+1)

Prasyarat: FMO3801

Kursus ini merangkumi komposisi kimia serta perubahan sifat fiziko-kimia hasil tumbuhan semasa pengendalian dan pemrosesan. Teknologi penghasilan dan kualiti berkaitan pelbagai hasil berasaskan tumbuhan dibincangkan.

This course covers chemical composition and changes in the physico-chemical properties of plant products during handling and processing. Processing technology and quality related to various plant-based products are discussed.

- FMO4802 Pembuatan Hasil Haiwan/ *Manufacturing of Animal Products* 3 (2+1)
 Prasyarat: FMO3801
 Kursus ini merangkumi komposisi kimia serta perubahan sifat fizikokimia hasilan berasaskan haiwan semasa pengendalian dan pemprosesan. Teknologi pengeluaran dan kualiti berkaitan pelbagai hasilan berasaskan haiwan dibincangkan.
This course encompasses chemical composition and changes in the physico-chemical properties of animal-based products during handling and processing. Production technology and quality related to various animal-based products are discussed.
- FMO4901 Latihan Industri/*Industrial Training* 12 (0+12)
 Prasyarat: Tiada/ *None*
 Melalui kursus ini, pelajar didedahkan kepada persekitaran kerja yang sebenar di industri/organisasi. Latihan merangkumi aplikasi aspek teori dan praktikal yang telah dipelajari dengan amalan semasa di tempat kerja. Kemahiran menyelesaikan masalah dan komunikasi turut diberi penekanan.
In this course, students are exposed to real working environment in industries/organizations. Training includes application of the theoretical and practical aspects that have been studied with current practices in the workplace. Problem solving and communication skills are also emphasized.
- FMO4902 Operasi Industri Pembuatan Makanan/ *Operations In Food Manufacturing Industry* 14 (0+14)
 Prasyarat: Tiada/ *None*
 Kursus ini merangkumi pelbagai fungsi utama operasi dalam industri pembuatan makanan. Aliran proses pembuatan makanan, pengurusan kualiti makanan, pengurusan sumber manusia, pengurusan sisa, pengurusan rantai bekalan dan pengembangan produk makanan diberi penekanan. Cadangan penyelesaian masalah dalam operasi pembuatan makanan melalui kajian saintifik dari segi reka bentuk, pengumpulan dan analisis data juga dijalankan.
This course encompasses various main functions of food manufacturing operations. Food manufacturing process flow, food quality management, human resource management, waste management, supply chain management and food product development are emphasized. Proposed problem solving in food manufacturing operations through scientific study in terms of appropriate design, data collection and analyses is also conducted.
- FMO4959 Disertasi Bacelor/ Bachelor Dissertation 6 (0+6)
 Prasyarat: Tiada/ *None*
 Kursus ini merangkumi penyediaan cadangan, pelaksanaan dan penulisan saintifik untuk sesuatu projek penyelidikan. Pendekatan saintifik bagi menjana data secara sistematik melalui rekabentuk, pengumpulan dan analisis data yang sesuai diberi penekanan.
This course encompasses the preparation of proposal, implementation and scientific writing of research project. Scientific approach to generate data systematically through appropriate design, data collection and analysis are emphasized.

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

FSM3007 Pengenalan Kepada Industri Perkhidmatan Makanan/ *Introduction to Food Service Industry* 3 (3 + 0)

Prasyarat: Tiada/ *None*

Kursus ini memperkenalkan pelbagai jenis operasi dan pengurusan dalam industri perkhidmatan makanan. Kitaran operasi perkhidmatan makanan bermula daripada perancangan menu, pembelian, penyediaan, pengeluaran makanan, pemasaran, sehingga ke jenis dan gaya perkhidmatan, ditekankan. Peluang kerjaya dalam sektor industri makanan yang berbeza turut dibincangkan.

This course introduces various types of operations and managements in the food service industry. The food service operation cycle, from menu planning, purchasing, preparation, food production, marketing, to service type and style, are emphasized. Career opportunities in different food industry sectors are also discussed.

FSM3206 Teknologi Penghasilan Makanan Berkuantiti/ *Technology in Mass Food Production* 3 (2 + 1)

Prasyarat: Tiada/ *None*

Kursus ini meliputi prinsip dan aplikasi unit operasi dalam pemprosesan makanan bagi industri perkhidmatan makanan untuk penghasilan makanan berkuantiti. Perbincangan merangkumi teknik pemprosesan makanan, peralatan pemprosesan makanan terkini dalam industri perkhidmatan makanan dan juga kerosakan makanan yang dihadapi oleh pengusaha perkhidmatan makanan.

This course covers the principle and application of unit operations in food processing for mass food production in the food service industry. Discussion includes food processing techniques, latest food processing equipment in the food service industry and food spoilage faced by food service operators.

FSM3304 Teori Asas Penyediaan Makanan/ *Basic Theory of Food Preparation* 3 (3 + 0)

Prasyarat: Tiada/ *None*

Kursus ini merangkumi penerangan dan aplikasi pelbagai prinsip penyediaan makanan, perbezaan pelbagai teknik penyediaan makanan berkualiti. Penekanan diberikan kepada pengurusan dan penyediaan bahan mentah, pengeluaran produk dan kemahiran profesional dalam industri perkhidmatan makanan.

This course covers the explanation and application of various principle of food preparation, differentiation of various techniques required in quality food production. Focus is given to the management and preparation of raw materials, food production and professional skills in the food service industry.

FSM3305 Amali Asas Penyediaan Makanan/ *Fundamental Laboratory for Food Preparation* 2 (0 + 2)

Prasyarat: Tiada/ *None*

Kursus ini merangkumi pelbagai kaedah dalam penyediaan makanan secara latihan amali. Ia meliputi kaedah asas pra-penyediaan bahan mentah, kaedah memasak dan juga persembahan makanan yang sesuai. Etika dalam penyediaan makanan juga ditekankan.

This course covers various methods of food preparations through hands-on practices. It comprises mise-en-place of raw materials, cooking techniques and presentation of the food. Ethics in food preparation is also emphasized.

FSM3402 Khidmat Layanan Restoran/ *Restaurant Services* 3 (1 + 2)

Prasyarat: FSM3304 dan FSM3305

Kursus ini memberi penekanan kepada pelbagai khidmat layanan profesional di restoran mengikut tema dan menu. Ini merangkumi pelbagai elemen pengendalian bahagian depan (*front-of-the-house*) seperti susun atur perunggu meja, dekorasi, suasana, promosi dan tempahan. Etika dan protokol pengurusan sesuatu majlis turut dibincangkan.

This course covers the principles and practices of human resource management in the food service industry. Emphasis is placed on employee recruitment, human resource development, performance evaluation and employee retention. Solutions to issues in human resources and industrial relations are also discussed.

FSM4102 Kaedah Penyelidikan Dalam Industri Makanan/ *Research Methodology* 3 (2 + 1)
in *Food Industry*

Prasyarat: Tiada/ *None*

Kursus ini merangkumi kaedah penyelidikan dalam industri makanan. Ini termasuk kaedah penyelidikan kuantitatif dan kualitatif. Aliran penyelidikan bermula daripada pencarian idea, reka bentuk penyelidikan, pensampelan sehingga ke analisis data juga dibincangkan. Penggunaan perisian SPSS untuk menganalisis data turut diliputi.

This course covers the research methods in food industry. This includes quantitative and qualitative research methods. Research flow starting from idea generation, research design, sampling to data analysis are discussed. The use of SPSS software for data analysis is also covered.

FSM4209 Inovasi Makanan Dalam Perkhidmatan Makanan/ *Food Innovation In* 3 (1 + 2)
Food Service

Prasyarat: FSM3207, FSM3305, FSM3502 dan FSM3606

Kursus ini memerlukan pelajar untuk mencipta formulasi menu baharu menggunakan pendekatan sains dan teknologi. Proses pembangunan menu baharu bermula dengan penjanaan idea dan konsep sehingga penghasilan produk prototaip. Penambahbaikan menu untuk kepuasan pelanggan dan penyelesaian masalah dalam inovasi makanan turut dibincangkan.

This course requires students to create new menu formulations using science and technology approaches. The process of the new menu development begins from generation of idea and concept until the production of product prototype. Menu improvements for customer satisfaction and problem solving in food innovation are also discussed.

FSM4210 Pemakanan Lanjutan Dalam Perkhidmatan Makanan/ *Advanced* 3 (3 + 0)
Nutrition in Food Service

Prasyarat: FSM3208

Kursus ini menekankan aspek keperluan pemakanan dan penyediaan menu untuk pelanggan daripada kumpulan tertentu pada setiap peringkat kitaran hidup, termasuk pesakit dan ahli sukan. Pembangunan menu untuk permintaan pemakanan khas pelanggan, permasalahan dan trend semasa dalam perkhidmatan makanan turut dibincangkan.

This course emphasizes on nutritional needs and menu preparation aspects in meeting the needs of clients at each stage of life cycle, including patients and athlete. Menu development for customer-specific nutrition requests, problems and current trends in food service are also discussed.

FSM4308 Penyediaan Makanan Warisan Malaysia/ *Preparation of Malaysian* 3 (1 + 2)
Heritage Foods

Prasyarat: FSM3304 dan FSM3305

Kursus ini merangkumi aspek keaslian bahan ramuan, teknik dan rasa dalam menyediakan makanan warisan mengikut negeri yang berbeza di Malaysia. Pembangunan formulasi dan cara penyediaan standard untuk makanan warisan Malaysia bagi kelestarian keasliannya juga ditekankan.

This course covers the authenticity aspect of ingredients, techniques, and taste in the preparation of Malaysian heritage foods based on the different states in Malaysia. Development of standard formulation and preparation methods of Malaysian heritage foods to sustain their authenticity are also emphasized.

FSM4309 Penyediaan Makanan Dan Khidmat Layanan Komersial/ *Commercial* 2 (0 + 2)
Food Preparation And Services)

Prasyarat: FSM3305 dan FSM3401

Kursus ini merangkumi proses perancangan majlis komersial sehingga pelaksanaannya. Ini merangkumi pelbagai elemen pengendalian dapur komersial (*back-of-the-house*) dan bahagian depan (*front-of-the-house*) seperti pembangunan menu dan resipi, penyediaan makanan, dan khidmat layanan profesional. Penekanan turut diberikan kepada elemen kerja berkumpulan dan keusahawanan secara latihan amali.

This course covers the commercial event planning process till its execution. This includes various elements of the commercial kitchen (back-of-the-house) and front-of-the house handling, such as menu and recipe development, food preparation, and professional service. Emphasis is also given to the elements of teamwork and entrepreneurship through practical training.

FSM4505 Digitalisasi Dan Pengurusan Sistem Maklumat Dalam Industri 3 (2 + 1)
Perkhidmatan Makanan/ *Digitalization and Management Information
Systems in Food Service Industry*

Prasyarat: FSM3007

Kursus ini merangkumi pelbagai jenis sistem pengurusan maklumat dan aplikasi terkini dalam perkhidmatan makanan. Penekanan juga diberikan kepada penggunaan komponen e-dagang, e-pemasaran dan media sosial dalam perkhidmatan makanan. Sistem pengurusan maklumat yang efisien dan kos efektif turut dibincangkan.

This course covers various types of management information systems and their latest applications in food service. Emphasis is also given to the use of e-commerce, e-marketing and social media components in food service. Efficient and cost-effective management information systems are also discussed.

FSM4507 Fasiliti, Susun Atur Dan Reka Bentuk Perkhidmatan Makanan/ *Food* 3 (2 + 1)
Service Facilities, Layout and Design

Prasyarat: FSM3402 dan FSM3502

Kursus ini merangkumi susun atur dan reka bentuk fasiliti perkhidmatan makanan dengan menggunakan perisian komputer. Pendedahan diberikan kepada analisis ruang bagi keseluruhan premis serta pemilihan dan susun atur peralatan.

Pengintergrasian faktor ergonomik dalam susun atur dan reka bentuk fasiliti turut diberi penekanan.
This course covers the food service facilities layout and design using computer softwares. Exposure to space analysis for the entire premise as well as selection and arrangement of equipment is also provided. The integration of ergonomic factors in facility layout and design is also emphasized.

FSM4602 Pengurusan Kualiti dalam Perkhidmatan Makanan/ *Quality* 3 (3 + 0)
Management in Food Service

Prasyarat: FSM3007

Kursus ini merangkumi pelbagai prinsip sistem kualiti dalam industri perkhidmatan makanan. Pendedahan diberikan kepada sistem pensijilan, pemastian dan pelbagai alat kawalan kualiti untuk memastikan kualiti makanan dapat dipertingkatkan bagi kepuasan pelanggan. Penyelesaian masalah berkaitan pengurusan kualiti di organisasi perkhidmatan makanan turut ditekankan.

This course covers various principles of quality systems in the food service industry. Exposure to certification system, assurance and various quality control tools is provided to ensure food quality can be improved for consumers' benefit. Problem-solving pertaining to quality management in food service organizations is also emphasized.

FSM4604 Pemasaran Dalam Perkhidmatan Makanan/ *Marketing In Food* 3 (3 + 0)
Service

Prasyarat: FSM3502

Kursus ini merangkumi konsep pemasaran, ciri perkhidmatan dan gelagat pengguna dalam perkhidmatan makanan. Teknik segmentasi, pemosisian dan pembangunan produk, analisis saluran pemasaran, promosi dan pengiklanan turut dibincangkan. Aktiviti berkaitan kajian pasaran dan pembangunan pelan pemasaran diberi penekanan.

This course covers the marketing concepts, service characteristics and consumer behavior in food service. Segmentation techniques, product development and positioning, marketing channel analysis, promotion and advertising are also discussed. Activities pertaining to market research and

development of marketing plan are also emphasized.)

FSM4705 Pengurusan Restoran/ *Restaurant Management* 3 (3 + 0)

Prasyarat: FSM3606 dan FSM4507

Kursus ini merangkumi operasi dan pengurusan restoran, bermula daripada kajian kebolehlaksanaan, pembangunan konsep, reka bentuk menu sehingga fasiliti restoran. Pengeluaran dan perkhidmatan makanan berkualiti serta pengurusan pemasaran, sumber manusia dan kewangan turut ditekankan. Aspek penting dalam operasi dan pengurusan restoran diintegrasikan dalam pembangunan pelan perniagaan.

This course covers restaurant management and operation, beginning from feasibility study, concept development, menu design till restaurant facilities. Quality food production and service as well as marketing management, human resource and finance are also emphasized. Important aspects in restaurant management and operation are integrated in the development of business plan.

FSM4706 Pengurusan Perkhidmatan Makanan Institusi/ *Institutional Food Service Management* 3 (3 + 0)

Prasyarat: FSM3208 dan FSM3502

Kursus ini merangkumi sistem pengurusan dan pengendalian perkhidmatan makanan institusi. Keberkesanan pengurusan institusi yang meliputi aspek pengurusan menu, sistem pengedaran makanan, logistik serta aplikasi sistem maklumat diberi penekanan. Kawalan kos operasi, kuantiti dan kualiti makanan bagi memastikan kelestarian perkhidmatan makanan institusi turut dibincangkan.

This course encompasses the handling and management system of institutional food service. The efficiency of institutional management that covers menu management, food delivery system, logistics and information system application aspects are emphasized. Controls over operational cost, quantity and quality of food to ensure institutional food service sustainability are also discussed.

FSM4707 Pengurusan Minuman /*Beverage Management* 3 (3 + 0)

Prasyarat: Tiada/ *None*

Kursus ini merangkumi prinsip pengurusan dalam penghasilan pelbagai produk minuman serta perkhidmatannya. Pendedahan kepada pelbagai jenis minuman termasuk minuman beralkohol, proses penyediaan, peralatan dan cara menghidang. Aspek pembangunan resipi, pengurusan minuman dan konsep perniagaan dibincangkan.

This course encompasses the management principles in the production of various beverage products, as well as its services. Exposure is given to various types of beverages, including alcoholic beverages, preparation process, equipment and serving methods. The aspects of recipe development, beverage management and business concept are discussed.

FSM4781 Keusahawanan Dalam Perkhidmatan Makanan/ *Entrepreneurship in Food Service* 3 (1 + 2)

Prasyarat: FSM4604

Kursus ini merangkumi pembangunan dan pelaksanaan pelan perniagaan perkhidmatan makanan yang berpotensi menjana keuntungan. Aktiviti perniagaan secara praktikal dijalankan dengan menekankan kemahiran pengurusan perniagaan dan budaya keusahawanan. Tumpuan diberikan kepada kreativiti dan inovasi dalam menguruskan perniagaan perkhidmatan makanan yang berdaya saing.

This course covers the construction and execution of food service business plan with potential to generate profit. Practical business activities are carried out with emphasis on business management skills and entrepreneurship culture. Focus is given to creativity and innovation in managing competitive food service business

FSM4805 Perundangan Industri Perkhidmatan Makanan/ *Food Service Industrial Law* 3 (3 + 0)

Prasyarat: Tiada/ *None*

Kursus ini merangkumi undang-undang berkaitan penubuhan dan pengoperasian industri perkhidmatan makanan. Tumpuan diberikan kepada peraturan, perlesenan, pensijilan dan akta perkhidmatan makanan. Undang-undang hospitaliti, hak sivil pelanggan dan isu turut diberi penekanan

This course covers the laws pertaining to the establishment and operation of the food service industry. Focus is given to regulations, licensing, certification and food service legislation. Hospitality laws, customer rights and issues are also emphasized

FSM4806 Kontrak Dan Francais Dalam Perkhidmatan Makanan/ *Contract and Franchise in Food Service* 3 (3 + 0)

Prasyarat: Tiada/ *None*

Kursus ini merangkumi elemen undang-undang kontrak dan francais dalam perkhidmatan makanan. Pengurusan konflik, litigasi, pertikaian dan salah laku dalam francais diberi penekanan. Pembangunan, pengurusan, trend pasaran dan isu berkaitan perniagaan francais dalam perkhidmatan makanan turut dibincangkan.

This course covers the elements of contract law and franchise in the food service. Conflict management, litigation, dispute and wrongdoing in franchising are emphasized. Development, management, market trend and issues related to franchise business in food service are emphasized

FSM4902 Latihan Industri/ *Industrial Training* 12 (0 + 12)

Prasyarat: Melengkapkan 200 jam latihan di rangkaian L'apprenti bagi pelajar BSPPM

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

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

FSM4959 Disertasi Bachelo/ *Bachelor Dissertation* 6 (0 + 6)

Prasyarat: Pelajar Semester 6 BS(PMK) dan 7 BS(PPM)

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

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

FMP3401 Pengurusan Sistem Maklumat dan Digitalisasi Dalam Industri Makanan/ *Information Systems Management And Digitalisation In Food Industry* 3 (2 + 1)

Prasyarat: Tiada/ *None*

Kursus ini merangkumi pembangunan sistem pengurusan maklumat dan aplikasi digital terkini dalam kemajuan industri makanan. Penekanan juga diberikan kepada penggunaan komponen e-bisnes, e-dagang, e-pemasaran dan media sosial dalam industri makanan. Sistem pengurusan maklumat yang efisien dan kos efektif dibincangkan.

The course covers the development of information management system and digital applications in food industry advancement. Emphasis is also given to the use of e- business, e-commerce, e-marketing and social media components in food industry. Efficient and cost-effective information management systems are discussed.

FMP3601 Keusahawanan Dalam Industri Makanan/ *Entrepreneurship in Food Industry* 3 (2 + 1)

Prasyarat: MGM3180

Kursus ini merangkumi aspek operasi perniagaan industri makanan. Tumpuan diberikan kepada kreativiti dan inovasi bagi produk makanan. Kemahiran pengurusan perniagaan dan budaya keusahawanan juga ditekankan.

This course covers the operational aspects of food business. Focus is given to creativity and innovation in food business. Business management skills and entrepreneurial culture are also emphasized.