GRADUATE STUDIES
GUIDE BOOK

FACULTY OF FOOD SCIENCE AND TECHNOLOGY
UNIVERSITY PUTRA MALAYSIA
43400 UPM, SERDANG
SELANGOR, MALAYSIA

CONTENTS

1.0 THE GRADUATE GUIDE BOOK FOREWORD

Welcome

Welcome to the Faculty of Food Science and Technology (FSTM), University Putra Malaysia. The Faculty is one of Malaysia's premier providers of education and research in food science and technology and food management. Currently, we are home to 160 post-graduate students and more than 500 undergraduate students. Our faculty and staff are active in research to solve contemporary issues in food technology, food safety, food biotechnology and food management. We are committed to excellence and the application of knowledge and expertise in classrooms, laboratories and communities. Thus Students interested in these fields can contact the respective lecture for further discussion. We invite you to explore the course work and research programmes presented in this Graduate Guide Book and to seek further information.

Professor Dr Jinap Selamat
Dean

2.0 UNIVERSITY PUTRA MALAYSIA

University Putra Malaysia (UPM) formerly known as University Pertanian Malaysia was founded in 1971 through the merger of the Faculty of Agriculture, University Malaya and the Agriculture College in Serdang. The three founder faculties were the Faculty of Agriculture, Faculty of Forestry and Faculty of Veterinary and Animal Science. UPM has maintained its traditional role in education by focussing its tertiary level research on agriculture and related research areas.

UPM aspired to be the University of the next millennium and in line with its vision, the name of University Putra Malaysia was changed to University Putra Malaysia by the former Malaysia's Prime Minister, Tun Dr Mahathir Mohamed on April 3, 1997. This is looked upon as a strategic move in preparing UPM as a versatile institution of higher learning in tandem with Malaysia's dynamic advancement to become an education hub for the Asia Pacific region.

2.1 Mission

The University's mission is to be a leading Centre of Learning and Resaerch in, contributing not only towards human advancement and discovery of knowledge but also to nation building and the creation of wealth.

2.2 Quality Policy

We, the staff of University Putra Malaysia are committed to excellence through the inculcation of a superior culture in teaching, research and professional services, to fulfill the expectations of our clients.

2.3 Goals

UPM has established eight (8) goals to realize its version. Each goal has its own specific objective. The achievement of each objective depends on the execution of the respective action plan. The eight goals are as follows:

1. To produce high quality graduates who are competitive and resilient through lifelong learning.
2. To transform UPM into a renowned research university
3. To upgrade UPM as a renowned centre of learning and agricultural and bio-resources services, internationally
4. To execute a quality management system that is effective, efficient, transparent and client-friendly.
5. To develop excellent human resources and create a professional work environment
6. To promote an information and communication technology (ICT) culture through e-University
7. To effectively generate and manage University Financial Resources
8. To establish UPM as the Center of Professional Development Services and Continuing Education

3.0 FACULTY OF FOOD SCIENCE AND TECHNOLOGY

3.1 History

The Faculty has a long and proud history of achievement. It began as a Department of Food Science and Technology in the Faculty of Agriculture in 1976. Only one program was offered at that time - Bachelor of Food Science and Technology.

The Department became a Faculty on March 1st, 1982 with two departments, the Department of Food Science and Department of Food Technology. In the year 1986, the Department of Biotechnology was established and became part of the Faculty with the offering of Bachelor of Science (Biotechnology) program.

In the year 1996, the Bachelor of Science (Food Studies) was firstly offered by the Faculty with two options: Food Quality Management and Food Management. The Food Service Administration and Food Marketing options were then offered in the years 1997 and 2000, respectively.

In the year 2004 (from August 1st), because the Department of Biotechnology became part of the Faculty of Biotechnology and Molecular Sciences, the Faculty was renamed as the Faculty of Food Science and Technology. The Faculty continues to expand with the establishment of Department of Management and Food Service on 16 January 2005. Faculty of Food Science and Technology continue to make new achievements with the establishment of Halal Food Institute and Food Strategic and Innovation Center in June 2005.

Faculty of Food Science and Technology at UPM is the most established institution of its kind in Malaysia. With nearly 30 years of experience, our post-graduate program is recognized through out South East and Central Asia. The fields of study offered are current and designed to challenge the intellect and increase the technical knowledge of those already in the workforce.

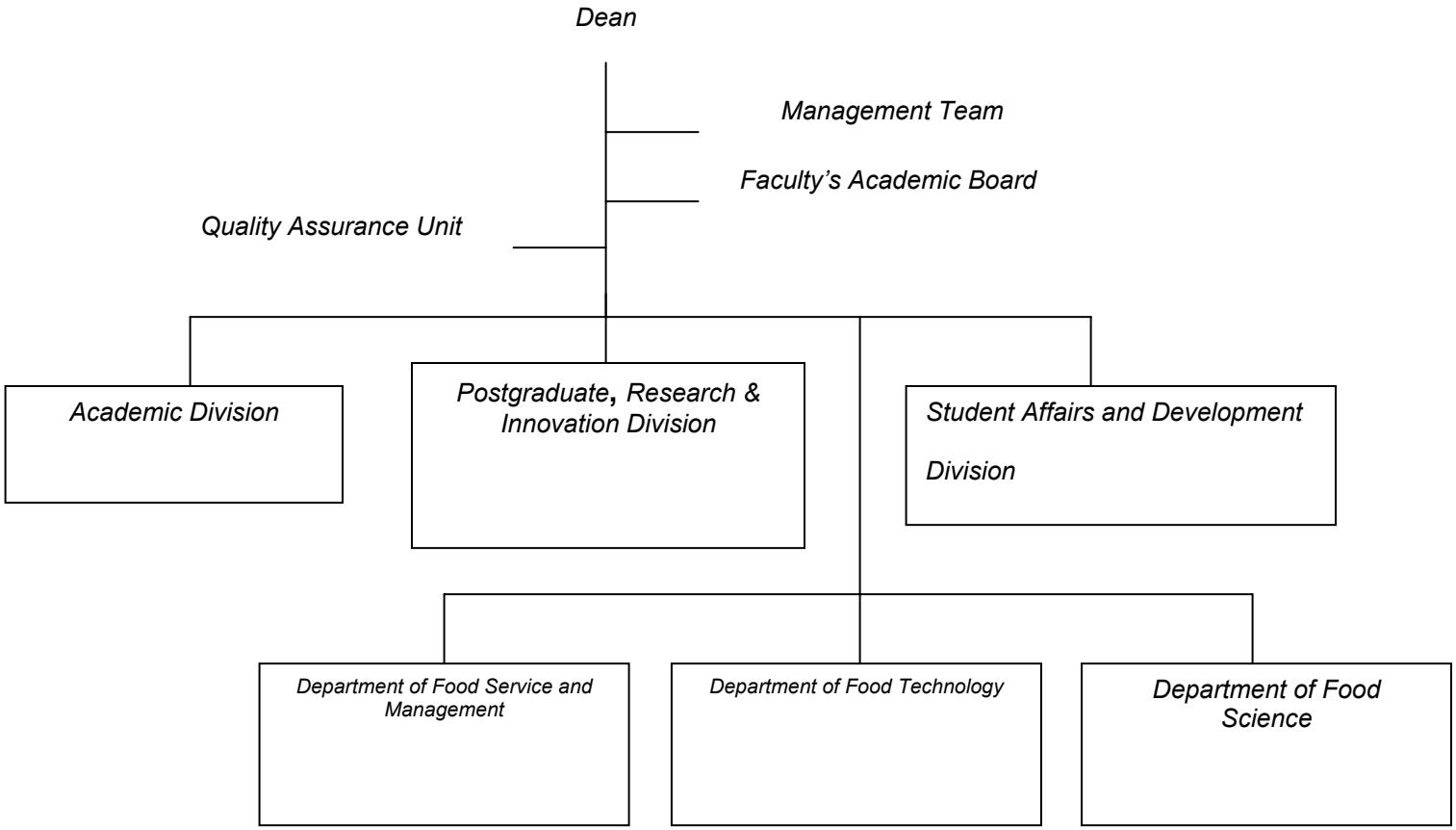
3.2 Vision

The vision of the Faculty is to achieve a sustainable excellence in teaching, research and professional services in the fields of Food Science and Technology and food studies

3.3 Mission

The mission of the Faculty is to provide quality services in teaching, research and professional services in the fields of Food Science and Technology and food studies

3.4 Organizational Structure of FSTM



3.5 **ACADEMIC STAFF**

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No photo available

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Department of Food Service Management

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3.6 FACULTY RESEARCH GROUPS

Research activities are one of the hallmarks of the faculty and carry the University's mission in maintaining the Research University status. Research inculcates enquiry, a quest for amazing discovery and evokes enthusiasm among staffs and students. It generates a firm realization and belief that academic knowledge is not static but constantly evolving and developing into new challenging phases. Research activities are fully endorsed and supported by the management with appropriate facilities in creating a conducive research environment with fascinating success. Faculty offers opportunity for creative endeavors in fundamental and applied research in the field of Functional Food and Food Biotechnology, Food Processing and Post harvest Technology, Food Safety and Quality and Food Management.

3.61 FOOD SAFETY RESEARCH GROUP

Microbiological Food Safety

i. Prof. Dr Son Radu
ii. Assoc. Prof. Dr Fatimah Abu Bakar
iii. Dr Farinazleen Mohd Ghazali

Chemical Food Safety

i. Prof. Dr Jinap Selamat
ii. Dr Hanifah Nuryani Lioe (Contract)

3.62 FOOD PROCESSING AND POST HARVEST RESEARCH GROUP

Food Technology/ Processing

i. Prof. Dr Jamilah Bakar
ii. Assoc. Prof. Dr Azizah Osman
iii. Assoc. Prof. Dr Sharifah Kharidah Syed Muhammad
iv. Assoc. Prof. Md Zaidul Islam Sarker (Contract)
v. Dr Roselina Karim
vi. Dr Nazimah Sheikh Abdul Hameed

Food Engineering

i. Prof. Dr Russly A. Rahman
ii. En Dzulkifli Mat Hashim
iii. Dr. Kassim Ali Abbas (Contract)

Fats and Oils

i. Prof. Dr Yaakob Che Man
ii. Dr Tan Chin Ping
iii. En Badlishah Sham Baharin

3.63 FOOD BIOTECHNOLOGY AND FUNCTIONAL FOOD RESEARCH GROUP

Food Biotechnology

i. Prof. Dr Mohd Yazid Abdul Manap
ii. Prof. Dr Hasanah Mohd Ghazali
iii. Assoc. Prof. Dr Nazamid Saari
iv. Karim Sabo Mohamad

Functional Foods

i. Prof. Dr Suhaila Mohamed
ii. Assoc. Prof. Dr Azizah Abdul Hamid
iii. Dr. Faridah Abas

3.64 FOOD MANAGEMENT RESEARCH GROUP

i. Dr Mohiddin Othman
ii. Dr Boo Huey Chern
iii. Dr Muhamad Shahrim Abdul Karim

4.0 Administration

Supporting Staff (Professional and Management)

No.	Name	Position	Office
1.	Siti Ima Munirah Ahmad B. Sc. (Food Studies) (UPM)	Assistant Registrar (Administrative and Finance)	
2.	Amiruddin Abd. Aziz Bac. Mgt. (Technol.) (UTM)	Assistant Registrar (Academic and Student Affairs)	
3.	Syed Izaharudden Syed Isa B. Sc. (Comp.) (UPM)	IT Officer	
4.	Shaerin Azlin Ab. Rahman B. Sc. (Comp.) (UPM) M.Sc. (Comp) (UPM)	Assistant Registrar (Postgraduate, Research & Innovation)	Division of (Postgraduate, Research & Innovation)
5.	Hamezan Ahmad @ Muhammad B. Sc. (UPM) M.Sc. (UPM)	Science Officer (Postgraduate,Research & Innovation)	
6.	Hanisah Abd. Rahman Bac. Sc. Food Service (UITM)	Administrative Officer	Quality Assurance Unit
7.	Norlinawati Abd. Halim Bac. Food Sc. & Tech (UPM)	Science Officer	Food Science Department
8.	Mohamed Kidin Bac. Food Sc. & Tech (UPM)	Science Officer (Pilot Plant)	Food Technology Department

No.	Name	Position	Office
10.	Md. Nizam Mahat @ Ibrahim B.Sc. (Food Studies) (UPM)	Food Technology Officer (Bakery Unit)	Food Service and Management Department
11.	Mimi Salwani Che Din Bac. Health Sciences (Dietetic)(USM)	Dietetic Officer	

Supporting Staff (Laboratory)

No	*Name*	*Position*
1.	En. Abd Halim Abd Rahman	Assistant Science Officer
2.	Azhar Mohd Noor	
3.	Abd. Hadi Mat Amin	
4.	Mohamad. Soib Yusof	
5.	Ainida Hj. Fauzi	Food Preparation Assistant Officer
6.	Azman Abu Yamin	Senior Lab Assistant
7.	Razali Othman	
8.	Jamaliah Ahmad	Lab Assistant
9.	Rosmawati Othman	
10.	Zulkefli Nordin	
11.	Jamilah Jahari	
12.	Amran Suratman	
13.	Noratina Darus	
14.	Siti Shahrul Bariah Ahmad	
15.	Norhafizah Abd. Razak	
16.	Siti Hafizah Ibrahim	
17.	Asmawati Mantali	
18.	Norliza Othman	
19.	Suraya Saad	
20.	Nur Fatihah Noor Musa	
21.	Nazizul Nadzir	
22.	Mohamad Noh Buhan	*Agriculture Assistant*
23.	Kamariah Jaafar	*General Worker*
24.	Abd. Rahim Adam	
25.	Zolkifli Johari	

No	Name	Position
26.	Zakiah Azizi	*General Worker*
27.	Misserah Lesot	
28.	Mohd Sahami Napiah	
29.	Mohd. Khairul Abu Bakar	
30.	Misiah Suboh	
31.	Zamilah Abu Bakar	

Supporting Staff (Administration)

No.	Name	Position
1.	Mohd. Rizan Md. Taib	*IT Assistant Officer*
2.	Siti Sarminah Ibrahim	*Administrative Assistant (Secretary)*
3.	Asmarani Abdullah	
4.	Siti Zaleha Ahmad	
5.	Nurul Aini Rahmat	*Administrative Assistant*
6.	Norsafida Anuar	
7.	Marisah Ayob	
8.	Raonah Sahir	
9.	Mohd. Asrah Abd. Latif	
10.	Norlaili Ismail	
11.	Suhaila Salleh	
12.	Ruzaini Tamin	
13.	Nor Hayati Salamuddin	
14.	Husaini Hussain	
15.	Naimah Ahmad	
16.	Zurainy Mohd Sharif	
17.	Nurul Nakiah Bong Julita	

18.	Faridah Muda	
19.	Siti Amirah Azman	
20.	Azlina Mat Deris	
21.	Wan Roslan Bin Wan Abdul Ghani	
22.	Rosyatimah Mohd Darus	
23.	Norazlindawati Hashim	
24.	Muhammad Hilmi Al-Hijri Md Lazim	*Administrative Assistant*
25.	Nasrul Shamsahal Din	
26.	Fazrul Azhar	
27.	Fauzi Mohd. Yusof	
28.	Rusli Md. Salleh	*Technician*
29.	Syed Mohd Shamsol Kamal Syed Naimi	
30.	Noor Mohamed Zin Mohd. Naim	*Junior Assistant*
31.	Zainal Markom	
32.	Mahily Ainuddin	*Driver*
33.	Abu Yamin Yaacob	
34.	Saridah Samat	*General Worker*

4.0 Academic Programme

POST-GRADUATE PROGRAMMES

MSc/PhD in Food Safety

The food production network is a very complex system in which the risk of hazards from food real. Therefore the use and application of higher technical expertise is necessary in the food industry. The food industry is now confronted with the farm-to-table food safety approach. There is an increased need for experts in food safety who are able to carry out monitoring and evaluation of parameters such as microbiology, chemicals and physical for product safety.

The purpose of this program is to prepare candidates with the relevant theory and technical knowledge to conduct research in the area of food safety. In this program the student will be able to understand in more detail issues that include pathogen, chemical hazard and GMO related to food safety. Student will be exposed to current information regarding the status, determination, effect of processing, as well as the application of HACCP, quality management and risk assessment of specific food.

MSc/PhD in Food Science

The field of food science includes food chemistry and biochemistry, functional food, food microbiology, food enzyme, food ingredients, and other related food. The program provides postgraduate opportunities to build on specific knowledge of food science. Students select from a range of courses to meet individual needs and specialization preferences and undertake a research project within the area of food science and technology which will include food enzymology, physico-chemico properties of food carbohydrates, food lipid, food protein and other polymers, flavor encapsulation, nutrition, functional food and food components, microorganism and food microbiology. Firm understanding in molecular interactions, food composition, interaction within food, microorganism and its environment and physical properties of food system can utilized in explaining the nutritional and quality changes of the food. The objective of the program is to produce graduates specialized in the field of food science and technology as well as ability to search, interpret, and critically evaluate and use the information obtained from various related sources.

MSc/PhD in Food Technology

This program offers challenging graduate courses to candidates who are keen to improve their knowledge in food technology. Student will be exposed to current issues in the field through courses offered and able to do research in their areas of interest. This program allows the student to focus their interest in either one of the fields namely food processing, food engineering, product development, food packaging and post harvest technology.

MSc/PhD in Food Biotechnology

This program aims to prepare the candidates with knowledge in relevant theories and technical know-how that would enable him to conduct research in the field of food biotechnology in this program, the student should not only be able to understand and discuss the significance and important of various biotechnology processes in the production of foods and food bio-ingredients, food bio-processing, and analysis of food components, but also be able to apply principles and concepts of various technologies in their research. In additional, the student would also acquire insight into the roles that modern biotechnology play in food security through the production of transgenic foods or genetically modified foods, and in improvement of food and food ingredients for the food industry, acceptance and the trade of genetically modified foods, and law and regulations that regulate the use of biological catalysts, microorganisms and plants (modified or otherwise) in food systems, and any prevailing issues in biotechnology-food relationship.

MSc/PhD in Food Management

This program offers innovative, dynamic and challenging courses to professionals who are keen to increase their knowledge and skill in food management. Students will be given exposure in a wholesome approach to increase their performance in their chosen job. The courses offered would enrich the students' knowledge in dynamic industry and how to conduct research and interpret information. The program allows students to do their research in HALAL food or food service management.

MSc/PhD in Food Service

The field of food science includes food chemistry and biochemisty, functional foods, food microbiology, food enzyme, food ingredients and other related fields. The program provides postgraduate opportunities to build on specific knowledge of food science. Students select from a range of courses to meet individual needs and specialization preferences and undertakes a research project within the area of food science and technology which will include food enzymology, physico-chemico properties of food carbohydrates, food lipid, food protein and other polymers, flavor encapsulation, nutrition, functional food and food components, microorganism and food microbiology. Firm understanding in molecular interactions, food composition, interaction within foods, microorganism and its environment and physical properties of food system can be utilized in explaining the nutritional and quality changes of the foods.
The objective of the program is to produce graduates specialized in the field of food science and technology as well as ability to search, interpret, critically evaluate and use the information obtained from various related sources.

5.0 Master of Science and Doctor of Philosophy

5.1 Admission Requirement

Master Science Programme with Thesis (MSc)

An applicant with good achievement in Bachelor of Science with CGPA at least 2.75 from UPM or other institutions that qualified by UPM. Applicant without sufficient academic qualification but possessing evidence of adequate related research or work experience may also eligible. A student in the final semester of undergraduate study may apply for provisional admission, provided his current CGPA satisfies the programme requirement.

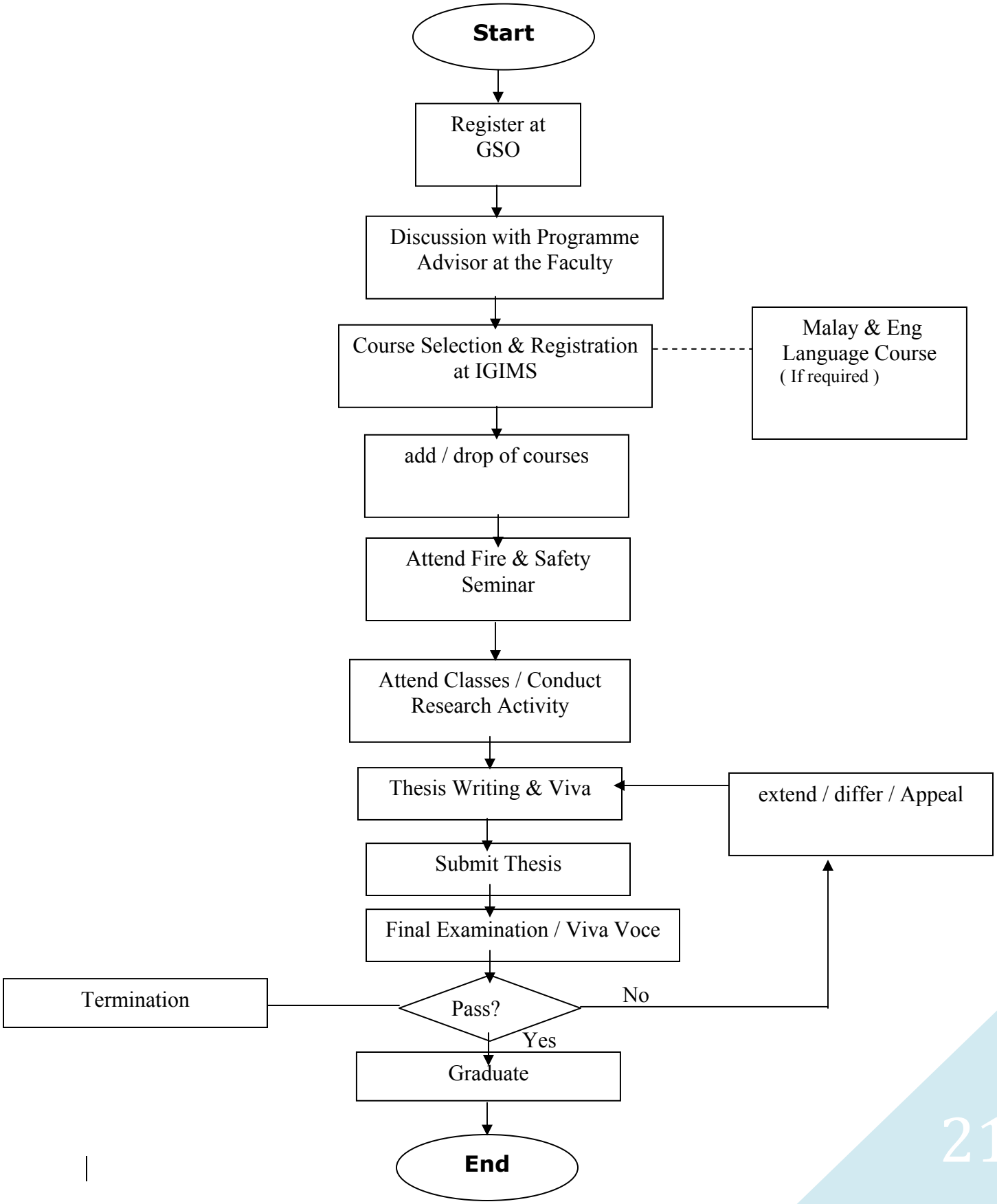
Doctorial Degree Programme (PhD)

An applicant with good achievement in Master Science from UPM or other institutions that qualified by UPM. An applicant with an outstanding Bachelor's degree with CGPA 3.75 and above or equivalent to first class honours also can apply for direct admission into PhD degree programme, but with condition. An applicant must pass one year of attempt admission. If qualify, applicant can apply for conversion.

Registration procedure

1) Offer letter will be produced by School of Graduate Studies to the new students and fill up the online registration
2) Discuss with represent supervisor/advisor due to learning programme
3) Registration endorsement by supervisor/advisor

5.1.1 Registration FLOWCHART



5.2 Duration

Master Science Programme with Thesis (MSc)

The programme is to be complete within minimum period of one year and maximum period of three years. Student can apply for extension, but The University reserves to reject the application.

Doctorial Degree Programme (PhD)

The programme is to be complete within minimum period of two years and maximum period of five years. Student can apply for extension, but The University reserves to reject the application.

5.3 Field of Research

Postgraduate Programme

Faculty of Food Science and Technology at UPM is the most established institution of its kind in Malaysia. With nearly 30 years of experience, our post-graduate program is recognized throughout South East and Central Asia. The fields of study offered are current and designed to challenge the intellect and increase the technical knowledge of those already in the workforce.

- **MSc/PhD in Food Safety**
- **MSc/PhD in Food Science**
- **MSc/PhD in Food Technology**
- **MSc/PhD in Food Biotechnology**
- **MSc in Food Management**

MSc/PhD in Food Safety

The food production network is a very complex system in which the risk of hazards from foods is real. Therefore the use and application of higher technical expertise is necessary in the food industry. The food industry is now confronted with the farm-to-table food safety approach. There is an increased need for experts in food safety who are able to carry out monitoring and evaluation of parameters such as microbiology, chemicals and physical for product safety.

The purpose of this program is to prepare candidates with the relevant theory and technical knowledge to conduct research in the area of food safety. In this program the student will be able to understand in more detail issues that include pathogen, chemical hazard and GMO related to food safety. Student will be exposed to current information regarding the status, determination, effect of processing, as well as the application of HACCP, quality management and risk assessment of specific food.

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The objective of the program is to produce graduates specialized in the field of food science and technology as well as ability to search, interpret, critically evaluate and use the information obtained from various related sources.

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This program offers challenging graduate courses to candidates who are keen to improve their knowledge in food technology. Students will be exposed to current issues in the field through courses offered and able to do research in their areas of interest. This program allows the students to focus their interest in either one of the fields namely food processing, food engineering, product development, food packaging and post harvest technology.

MSc/PhD in Food Biotechnology

This program aims to prepare the candidate with knowledge in relevant theories and technical know-how that would enable him to conduct research in the field of food biotechnology. In this program, the student should not only be able to understand and discuss the significance and importance of various biotechnology processes in the production of foods and food bioingredients, food bioprocessing, and analysis of food components, but also be able to apply the principles and concepts of the various technologies in their research. In addition, the student would also acquire an insight into the roles that modern biotechnology play in food security through the production of transgenic foods or genetically modified foods, and in the improvement of food and food ingredients for the food industry, acceptance and trade of genetically modified foods, and law and regulations that regulate the use of biological catalysts, microorganisms and plants (modified or otherwise) in food systems, and any prevailing issues in biotechnology-food relationship.

MSc in Food Management

This program offers innovative, dynamic and challenging courses to professionals who are keen to increase their knowledge and skill in food management. Students will be given exposure in a wholesome approach to increase their performance in their chosen job. The courses offered would enrich the students' knowledge in dynamic industry and how to conduct research and interpret information. The program allows students to do their research in HALAL food or food service management.

Study Programme

- **MSc/PhD in Food Safety**
- **MSc/PhD in Food Science**
- **MSc/PhD in Food Technology**
- **MSc/PhD in Food Biotechnology**
- **MSc in Food Management**

Research group of Faculty of Food Science and Technology

Post harvest Technology and Processing

Prof. Dr Jamilah Bakar (Food Technology/Aquatic Technology)
Prof. Dr Russly Abdul Rahman (Food engineering/Food Packaging)
Prof. Dr Yaakob Che Man (Food Technology/Fats and Oils Technology/ Halal Management)
Assoc. Prof. Dr Azis Arifin (Biochemistry/ Oil Technology)
Assoc. Prof. Dr Azizah Osman (Post Harvest Handling of Fruits and Vegetables)
Assoc. Prof. Dr Sharifah Karidah Syed Muhammad (Food Chemistry/ Carbohydrate Chemistry)
Dr Roselina Karim (Carbohydrate Chemistry and Technology/Sensory Evaluation)
Dr Tan Chin Ping (Food Processing/ Chemistry and Technology of Oils and Fats)
Dr Kassim Abas (Food Engineering)
Dr. Nazimah Sheikh Abdul Hameed (Food Chemistry/Processing)
En Dzulkifly Mat Hashim (Rheology/ Food Engineering)
Dr Noranizan Mohd Adzahan (Food Processing/non-thermal processing)

Food Biotechnology and Functional

Prof. Dr Mohd Yazid Abdul Manap (Dairy Technology/ Probiotics)
Prof. Dr Hasanah Mohd Ghazali (Enzyme Technology/ Food Biotechnology)
Prof. Dr Suhaila Mohamed (Food Chemistry/ Functional food)
Assoc. Prof. Dr Azizah Abd Hamid (Food Chemistry/ Functional food)
Assoc. Prof. Badlishah Sham Baharin (Food engineering/ Bioprocess Engineering)
Assoc. Prof. Dr Nazamid Saari (Food Enzymology/Food Biochemistry)
Dr Karim Sabo Mohamed (Food Chemistry/ Food Biotechnology)

Food Safety

Prof. Dr Jinap Selamat (Food Safety/Food Chemistry)
Rof. Dr Son Radu (Molecular Biology)
Assoc. Prof. Dr Fatimah Abu bakar (Food Microbiology)
Dr Farinazleen Mohd Ghazali (Food Microbiology)
Dr Faridah Abas (Phytochemistry/ Instrumentation)

Food Management

Dr Mohiddin Othman (Hospitality/Foodservice)
Dr Boo Huey Chern (Hospitality/ Marketing)
Dr Muhammad Sharim Abd Karim (Hospitality/Tourism)

9.0 LIST OF COURSES IN FACULTY OF FOOD SCIENCE & TECHNOLOGY

No.	Code	Name	Credit
MASTER PROGRAMME			
1	FST 5001	Topik Khas *(Special Topic)*	3(3 + 0)
2	FST 5002	Kaedah Penyelidikan dan Statistik dalam Sains dan Teknologi Makanan *(Research Methodology and Statistics in Food Science and Technology*)	3(3 + 0)
3	FST 5101	Komponen Makro Makanan Lanjutan *(Advanced Macrocomponent of Food)*	3(3 + 0)
4	FST 5102	Perkaedahan Lanjutan Analisis Makanan *(Advanced Methodology in Food Analysis)*	3(2 + 1)
5	FST 5201	Ekologi Mikrob Komoditi Makanan *(Microbial Ecology of Food Commodities)*	3(3 + 0)
6	FST 5202	Sistem Pengurusan Kualiti dan Keselamatan Makanan *(Quality Management System and Food Safety*)	3(3 + 0)
7	FST 5203	Patogen Bawaan Makanan *(Foodborne Pathogens)*	3(3 + 0)
8	FST 5204	Toksikoloji Makanan Lanjutan *(Advanced Food Toxicology)*	3(3 + 0)
9	FST 5205	Diagnostik Makanan (Food Diagnostics)	3(1 + 2)
10	FST 5301	Biokimia dan Fisiologi Lepastuai Komoditi Makanan *(Postharvest Biochemistry and Physiology of Food Commodities)*	3(3 + 0)
11	FST 5401	Kejuruteraan dan Pemprosesan Makanan (*Food Engineering and Processing)*	3(3 + 0)
12	FST 5402	Sifat Fizikal Makanan *(Physical Properties of Foods)*	3(3 + 0)
13	FST 5501	Bioteknologi Industri Makanan *(Industrial Food Biotechnology)*	3(3 + 0)
14	FST 5502	Biopemprosesan Makanan *(Food Bioprocessing)*	3(3 + 0)
15	FST 5903	Seminar *(Seminar)*	1(0 + 1)

16	**PMK 5001**	**Topik Khas** ***(Special Topic)***	**3(3 + 0)**
17	**PMK 5101**	**Pemilihan dan Penerimaan Makanan** ***(Food Choice and Acceptability)***	**3(3 + 0)**
18	**PMK 5102**	**Operasi Perkhidmatan Makanan Strategik** ***(Strategic Foodservice Operation)***	**3(3 + 0)**
19	**PMK 5903**	**Seminar** ***(Seminar)***	**1(0 + 1)**
PHD PROGRAMME			
1	FST 6001	**Topik Khas** *(Special Topic)*	**3(3 + 0)**
2	FST 6101	**Isu Dalam Sains Makanan** *(Issues in Food Science)*	**3 (3 + 0)**
3	FST 6201	**Isu Keselamatan Makanan** *(Food Safety Issues)*	**3 (3 + 0)**
4	FST 6301	**Tren dalam Teknologi Makanan** *(Trends in Food Technology)*	**3 (3 + 0)**
5	FST 6501	**Bioramuan Makanan** *(Food Bioingredients)*	**3 (3 + 0)**
6	**FST 6903**	**Seminar** ***(Seminar)***	**1(0 + 1)**

SYNOPSIS OF COURSES

Course Code : FST 5001
Course Name: *(Special Topic)*
Credit: 3(3 + 0)

The course requires students to retrieve scientific information on selected topics and critically analyse the information in order to strengthen the students' knowledge in the area of food science and technology or biotechnology.

Course Code : FST 5002
Course Name: Research Methodology and Statistics in Food Science *and Technology*)
Credit: 3(3 + 0)

Sampling and technique of sampling. Probability, normal distribution and confidence interval. Hypothesis testing, type of errors and power tests. Principles of experimental design, role of replication and randomization. Descriptive statistics and significant testing. Mean difference between two or more variables, pair-wise comparisons and other multiple comparisons.

Correlation and regression. One-way and multi way ANOVA, Regression analysis, linear and non-linear models. Response surface methodology).

FST 5101
(Advanced Macrocomponent of Food)
3(3 + 0)

Topics that will be covered in this course include physico-chemical properties of water, food carbohydrates, lipids and proteins, structure, sources and changes during storage and processing and factors affecting the changes. Modifications and applications of various food macrocomponents will also be discussed.

FST 5102
(Advanced Methodology in Food Analysis)
3(2 + 1)

The course shall cover various major spectroscopic and chromatographic techniques employed in the analysis of food components like proteins, carbohydrates, fats anf oils, vitamins, pigments, phytochemicals and others. Other methodologies that shall be discussed will include microscopy, rheology, thermal analysis and immunoassay.

FST 5201
(Microbial Ecology of Food Commodities)
3(3 + 0)

This is an advanced course on food microbiology with emphasis on the different groups of microorganisms that can cause spoilage of a food commodity which include bacteria, yeast and mold. Factors that affect the growth and selection of the dominant spoilage microorganisms during handling, processing and storage of the food commodity will be discussed. Role of microorganisms and the biochemical changes during fermentation of selected food commodity will also be discussed.

FST 5202
***(Quality Management System and Food Safety*)**
3(3 + 0)

Topics covered will include areas of quality systems used in food processing establishments, regulation covering the quality and safety of food, product liability, food and personal hygiene, risk assessment, hazard analysis critical control points system (HACCP) principles, cleaning and sanitation of food processing sited and equipment, product recall procedures, sampling plans and inspection for microbiological analysis, management and quality assurance in a microbiology laboratory, evaluation and validation of analytical methods and writing food safety plans.

FST 5203
(Foodborne Pathogens)
3(3 + 0)

This course will discuss the characteristics of pathogenic mikroorganisms involved in food poisoning and emphasis will be given on factors affecting growth of the pathogens, conditions that cause gastroenteritis, toxin production and effect on human.

FST 5204
***(Advanced Food Toxicology*)**
3(3 + 0)

The course will cover types of toxicity and mechanism of distribution, toxic compounds in foods and biological response towards toxins, carcinogen, mutagen and teratogens. Types of toxic compounds and their mode of action and methods of detection will also be discussed

FST 5205
(Food Diagnostics)
3(1 + 2)

This course aims to allow students to conceptualize current technologies and their feasibility for analyzing biomolecules that could be applied to problems in food safety based on target/diagnostic molecules. Food diagnostics covers new demand for routine monitoring and verification of pathogen or genetically modified foods using analytical methods capable of detecting, identifying, and quantitating either the DNA (introduced) or the protein(s) expressed. This will includes suitable analytical methods for raw and processed foods and non-culturable pathogen in foods.

FST 5301
(Postharvest Biochemistry and Physiology of Food Commodities)
3(3 + 0)

This course covers post-harvest biochemical and physiological changes in food commodities (fruits, vegetables, meat and seafood) and quality of food commodities – criteria and factors affecting their quality).

FST 5401
(*Food Engineering and Processing)*
3(3 + 0)

The principles in pre-processing operations, thermal processing, non-thermal processing, low temperature preservation and dehydration of foods. Concepts and applications of size reduction and material handling in pre-processing operation, heat treatment in pasteurization and sterilization and ozonation and dehydration. Shelf-life attributes of food commodities during storage. Case studies of selected food commodities. An intergrated production system for a food powder processing line.

FST 5402
(Physical Properties of Foods)
3(3 + 0)

Physical properties of foods that are important in handling, preparing, processing, preserving, packaging, storing and distribution of foods. Topics covered include the properties of water in foods, rheological properties of solid and liquid foods, properties of particulate foods, thermal, aerodynamic and hydrodynamic, electromagnetic and optical properties of foods. Recent developments in methods of measurement of physical properties will also be covered.

FST 5501
(Industrial Food Biotechnology)
3(3 + 0)

This course shall discuss the involvements of biotechnology in the food and food ingredient industries, and research in food science and technology. Topics that shall be covered will include the applications of fermentation, enzyme, plant cell culture and recombinant DNA technologies, the applications of biomolecules as agents in the analysis of food components, and issues on the potentials of up and coming technologies (e.g. metabolic engineering and nanotechnology), societal and public attitudes towards new foods, `halal-haram' issues and laws that regulate the use of biotechnology processes in food systems.

FST 5502
(Food Bioprocessing)
3(3 + 0)

This course shall (i) expose the student to the evolution of enzymes and microbial applications in the development of `green technology' especially the food industry and (ii) discuss the technological roles of enzymes and microorganisms from the following aspects: classes and properties of enzymes, basis of enzyme reaction kinetics, sources and chemical reactions catalysed by endogenous and commercial food enzymes, the commercial enzyme market; applications of enzymes in food processing, important groups of food microorganisms, types of

food fermentation, applications of microorganisms in the production of food products and industrial metabolites, and current issues.

FST 5903
(Seminar)
1(0 + 1)

This course involves training, preparation and presentation of research project. Every graduate student is required to prepare and present his/her results at the end of the study program.

PMK 5001
(Special Topic)
3(3 + 0)
The course requires students to retrieve for scientific information on selected topics and critically analyse the information in order to strengthen the students' knowledge in the area of food management.

PMK 5101
(Food Choice and Acceptability)
3(3 + 0)

Food choice and method of determining product acceptability. Models of food choice behaviour. Sensory characteristics of food and their importance. Methods of assessing food quality characteristics and their acceptability. Social factors that affect food choice by consumers.

PMK 5102
(Strategic Foodservice Operation)
3(3 + 0)

This course covers operation management from strategic perspective. It will include functions of sub-system in the food service operation namely purchasing, production, distribution and service.

PMK 5903
(Seminar)
1(0 + 1)

This course involves training, preparation and presentation of research project. Every graduate student is required to present his/her results at the end of his/her study program.

Ph.d

FST 6001
(Special Topic)
3(3 + 0)

The course requires students to retrieve for scientific information on selected topics and critically analyse the information in order to strengthen the students' knowledge in the area of food science and technology or food biotechnology.

FST 6101
(Issues in Food Science)
3 (3 + 0)

*Current issues will be identified by the course coordinator and topics for discussion will vary from year to year. Topics discussed include those in the field of food chemistry and biochemistry, food safety and microbiology, functional foods and health claims, GMO, nutritional labeling, "halal" food and other relevant topics. Latest finding on association between degenerativ*e diseases and food intake will also be discussed.

FST 6201
(Food Safety Issues)
3 (3 + 0)

Current issues will be identified by the course coordinator. Topics for discussion will vary from year to year. Examples of topics for discussion are as follows: "emerging foodborne pathogens", "risk analysis", predictive microbiology", "food biotechnology", "GMO", "non-thermal processing technologies", "food supplement and regulations", "neutraceuticals", "food labeling and international food safety regulations", "food safety analsyis" and other relevant topics.

FST 6301
(Trends in Food Technology)
3 (3 + 0)

This course will involve students in critical discussions on trends in food technology. Topics for discussion include: Trends in the local and international food industries, product scanning and value chain analysis, current and emerging food processing technologies, technology and product prioritisation, competency and food technology mapping.

FST 6501
(Food Bioingredients)
3 (3 + 0)

This course shall discuss the classes, regulatory status of ingredients in foods, their functions and applications in food or food processing. Topics to be covered shall also include the technologies that are currently used to produce food bioingredients, and alternative technologies, current issues such as safety aspects of food bioingredients especially transgenic ingredients, ingredient labelling and others.

FST 6903
Seminar
(Seminar)
1(0 + 1)

This course involves training, preparation and presentation of project results. Every graduate student is required to prepare and present his/her result at the end of his/her study program.

10.0 LIST OF FREQUENTLY USED TELEPHONE NUMBERS

HEAD DEPARTMENT

Profesor Dr. Jinap Selamat	Dean	03-8946 8367
Prof. Madya Dr. Nazamid Saari	Deputy Dean	03-8946 8371
Prof. Madya Dr. Azizah Abdul Hamid	Deputy Dean	03-8946 8368
Profesor Dr. Russly Abdul Rahman	Deputy Dean	03-8946 8377
Prof. Madya Dr. Fatimah Abu Bakar	Head Department	03-8946 8387
Profesor Dr. Jamilah Bakar	Head Department	03-8946 8407
Profesor Dr. Mohd Yazid Abdul Manap	Head Department	03-8946 8353

ACADEMIC DIVISION

Prof. Madya Dr. Nazamid Saari	Deputy Dean	03-8946 8371
Norhayati Salamuddin	Administrative Assistant	03-8946 8371
Amiruddin Abdul Aziz	Administrative Officer	03-8946 8416
Ruzaini Tamin	Administrative Assistant	03-8946 8417
Suhaila Salleh	Administrative Assistant	03-8946 8417
Siti Nurul Huda Sheikh Ramli	Administrative Assistant	03-8946 8417
Mohd Affendy Arshad	Administrative Assistant	03-8946 8417
Mohd Sahami Napiah	General Worker	03-8946 8417

DEVELOPMENT AND STUDENT AFFAIRS DIVISION

Prof. Dr. Russly Abdul Rahman	Deputy Dean	03-8946 8377
Siti Amirah Azman	Administrative Assistant	03-8946 8377
Amiruddin Abdul Aziz	Administrative Officer	03-8946 8416
Md Munir Md Aris	Administrative Assistant	03-8946 8366

POST-GRADUATES, RESEARCH AND INNOVATION

Prof. Madya Dr. Azizah Abdul Hamid	Deputy Dean	03-8946 8368
Asmarani Abdullah	Secretary	03-8946 8368
Shaerin Azlin Abdul Rahman	Administrative Officer	03-8946 8347
Hamezan Muhammad@Ahmad	Science Officer	03-8946 8538
Mohd Fauzi Mohd Yusof	Administrative Assistant	03-8946 8369
Noorsafida Anuar	Administrative Assistant	03-8946 8369
Mohd Izra Yusman Abdul Rahman	Administrative Assistant	03-8946 8369
Nazizul Nadzir	Lab Assistant	03-8946 8384
Norliza Othman	Lab Assistant	03-8946 8384
Suraya Saad	Lab Assistant	03-8946 8384
Misiah Suboh	General Worker	03-8946 8384

INFORMATION TECHNOLOGY UNIT

Syed Izaharudden Syed Isa	IT Officer	03-8946 8403
Mohd Rizan Md Taib	IT Assistant Officer	03-8946 8405
Rusli Md Salleh	Technician	03-8946 8397
Syed Mohd Shamsol Kamal Syed Naimi	Technician	03-8946 8397
Mohd Hilmi Al-Hijiri Md Lazim	Administrative Assistant	03-8946 8405

RESEARCH LABORATORY

Food Biotechnology & Functional Food (FBFF)

Lab 1 (FBFF 1)	03-89415807
Lab 2 (FBFF 2)	03-89415807
Lab 3 (FBFF 3)	03-89418384

Food Processing & Post-Harvest (FPPH)

Lab 1 (FPPH 5)	03-89418349

Food Safety & Quality (FSQ)

Lab 1 (FSQ 1)	03-89418351
Lab 1 (FSQ 2)	03-89415807

TEACHING LABORATORY

Microbiology lab	03-89468382
Biochemistry Lab	03-89468380
Food Processing	03-89468401
Food Engineering	03-89468390
Food Service Complex	
Pilot Plant	03-89468415

Student Health Centre	03-8946 7350

Emergency Line	999

SECURITY UPM

Security Centre (24 hours)	03-89467990
Traffic Unit	03-89466113
Special Task	03-89466117
CCTV Cell	03-89462066
Zon B Monitoring Section (Hostel)	03-89467992
General Office	03-89466114
Fax Number	03-89433468

FIREBRIDGED STATION

Seri Kembangan	03-89416281
Bangi	03-89254444
kajang	03-87364444

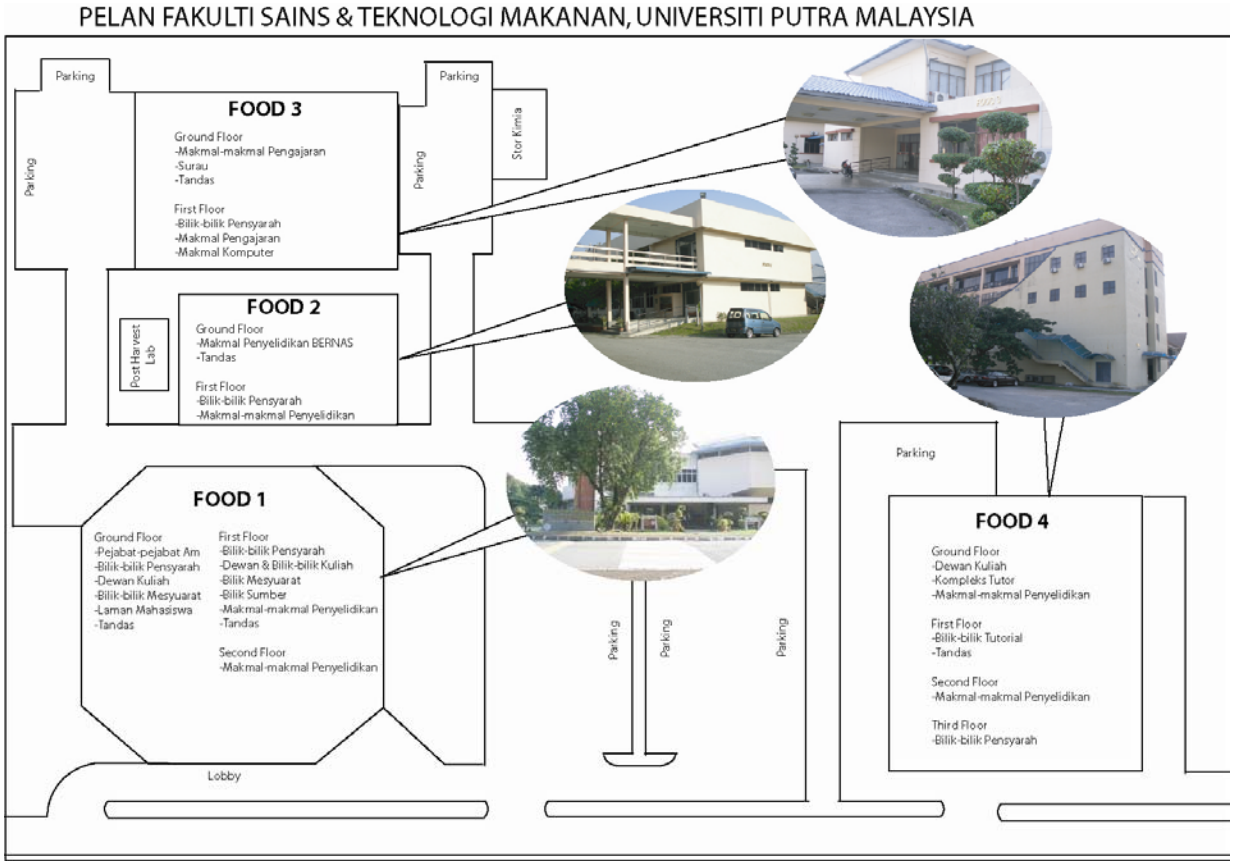
POLICE STATION

Serdang	03-8948 6222
Seri Kembangan	03-8948 6122

HOSPITAL

Hospital Serdang	03 8947 5555
Hospital Putrajaya	03 8888 0080

FSTM MAP



FOOD 5 - Pilot Plant

FOOD 6 - Food Service Complex

FOOD 7 – National Food Safety Research Lab (Infoport)