SCHOOL OF CHEMICAL & ENERGY ENGINEERING

DOCTOR OF PHILOSOPHY

FIELD OF RESEARCH: BIOPROCESS ENGINEERING

PROGRAMME SPECIFICATIONS

The Doctor of Philosophy Field of Research: Bioprocess Engineering (PKKB) is offered on a full-time basis. The duration of study is in between minimum of three (3) years to a maximum of eight (8) years.

The assessment of the research program is based on the progress report, supervisor's evaluation, research proposal and viva.

General Information

1. Awarding Institution			Universiti Teknologi Malaysia
2. Teaching Institution			Universiti Teknologi Malaysia
3. Programme Name			Doctor of Philosophy
4. Final Award			Doctor of Philosophy Field of research: Bioprocess Engineering
5. Programme Code			PKKB
6. Professional or Statutory Body of Accreditation			MQA
7. Language(s) of Instruction			English
8. Mode of Study (Conventional, distance learning, etc)			Research
9. Mode of operation (Franchise, self-govern, etc)			Self-governing
10. Study Scheme (Full Time/Part Time)			Full Time
11. Study Duration			Minimum : 3 years Maximum : 8 years
Type of Semester	No. of Semesters		No of Weeks/Semester
	Min	Max	
Normal	6	16	14

Short	-	-

Course Classification

No.	Classification	Credit Hours	Percentage
i.	University Elective (1 course)	3	
ii.	Research Methodology	HW	
iii.	Research (Minimum 6 semesters)	0	
iv	Thesis	0	
	Total	**3**	

Program Educational Outcomes (PEO)

PEO 1: Graduates are able to in-depth knowledge in bioprocess engineering related areas.

PEO 2: Graduates are able to formulate, solve and conduct problems through effective and critical thinking skills.

PEO 3: Graduates are able to organize relevant knowledge and expertise through effective oral and written communications.

PEO 4: Graduates able to develop relevant knowledge, promote professional and ethical responsibilities including contemporary issues and environmental awareness.

Program Learning Outcome (PLO)

PLO 1: Incorporate continuing and advanced knowledge in bioprocess engineering related areas.

PLO 2: Formulate hypothesis, design and reorganize experiments/research scientifically to solve and evaluate observed phenomena.

PLO 3: Analyze and evaluate critically problems in related areas through effective thinking skills, particularly in situations with limited information and to provide solutions through the application of appropriate tools and techniques.

PLO 4: Display ideas and technical findings in both written and oral forms effectively.

PLO 5: Plan and perform research undertakings professionally, ethically and responsibly.

PLO 6: Perform lifelong learning for the needs of continuing professional development.

GRADUATION CHECKLIST

To graduate, students must pass all the stated courses and assessment in this checklist. It is the responsibility of the students to ensure that all courses and

assessment are taken and passed. Students who do not complete any of the assessment are not allowed to graduate.

NO.	CODE	COURSE	CREDIT EARNED (JKD)	CREDIT COUNTED (JKK)	TICK (√) IF PASSED
SCHOOL OF CHEMICAL & ENERGY ENGINEERING COURSES					
1	UXXX XXX3	University Elective (1 course)			
2	UKKP 0010	Research Methodology			
3	PKKB XX00	Research (Minimum 2 semesters)			
4		Thesis			
5		Publication (minimum one (1) refereed article or two (2) indexed conference proceedings accepted as published in SCOPUS/ERA/WOS)			

DOCTOR OF PHILOSOPHY

FIELD OF RESEARCH: CHEMICAL ENGINEERING

PROGRAMME SPECIFICATIONS

The Doctor of Philosophy Field of Research: Chemical Engineering (PKKK) is offered on a full-time basis. The duration of study is in between minimum of three (3) year to a maximum of eight (8) years.

The assessment of the research program is based on the progress report, supervisor's evaluation, research proposal and viva.

General Information

<table>
<tr><td colspan="3">1. Awarding Institution</td><td>Universiti Teknologi Malaysia</td></tr>
<tr><td colspan="3">2. Teaching Institution</td><td>Universiti Teknologi Malaysia</td></tr>
<tr><td colspan="3">3. Programme Name</td><td>Doctor of Philosophy</td></tr>
<tr><td colspan="3">4. Final Award</td><td>Doctor of Philosophy
Field of research: Chemical Engineering</td></tr>
<tr><td colspan="3">5. Programme Code</td><td>PKKK</td></tr>
<tr><td colspan="3">6. Professional or Statutory Body of Accreditation</td><td>MQA</td></tr>
<tr><td colspan="3">7. Language(s) of Instruction</td><td>English</td></tr>
<tr><td colspan="3">8. Mode of Study (Conventional, distance learning, etc)</td><td>Research</td></tr>
<tr><td colspan="3">9. Mode of operation (Franchise, self-govern, etc)</td><td>Self-governing</td></tr>
<tr><td colspan="3">10. Study Scheme (Full Time/Part Time)</td><td>Full Time</td></tr>
<tr><td colspan="3">11. Study Duration</td><td>Minimum : 3 years
Maximum : 8 years</td></tr>
<tr><td rowspan="2">Type of Semester</td><td colspan="2">No. of Semesters</td><td>No of Weeks/Semester</td></tr>
<tr><td>Min</td><td>Max</td><td></td></tr>
<tr><td>Normal</td><td>6</td><td>16</td><td>14</td></tr>
<tr><td>Short</td><td colspan="2">-</td><td>-</td></tr>
</table>

Course Classification

No.	Classification	Credit Hours	Percentage
i.	University Elective (1 course)	3	
ii.	Research Methodology	HW	
iii.	Research (Minimum 6 semesters)	0	
iv	Thesis	0	
	Total	**3**	

The Programme educational objectives (PEOs) are listed below;

PEO1: Enable graduate to incorporate in-depth knowledge in chemical engineering related areas
PEO2: Formulate, solve and conduct problems through effective and critical thinking skills
PEO3: Enable graduate to organise relevant knowledge and expertise through effective oral and written communications
PEO4: Enable graduate to develop relevant knowledge, promote professional and ethical responsibilities including contemporary issues and environmental awareness.

The Programme learning outcomes (PLOs) are listed below;

PLO1: Able to demonstrate an in-depth advance knowledge in chemical engineering-related areas using the techniques and skills for chemical engineering practice.
PLO2: Ability to independently manage problem in scientific research, individually or collectively using acceptable methodologies and tools.
PLO3: Ability to articulate and convince ideas and findings through collaborative work, oral presentation and scientific/journal writing.
PLO4: Ability to perform intellectual honesty and integrity throughout the learning process
PLO5: Ability to perform lifelong learning from any resources.
PLO6: Ability to display work both independently and in team including providing motivation, and delegating tasks.

GRADUATION CHECKLIST
To graduate, students must pass all the stated courses and assessment in this checklist. It is the responsibility of the students to ensure that all courses and assessment are taken and passed. Students who do not complete any of the assessment are not allowed to graduate.

NO.	CODE	COURSE	CREDIT EARNED (JKD)	CREDIT COUNTED (JKK)	TICK (√) IF PASSED
SCHOOL OF CHEMICAL & ENERGY ENGINEERING COURSES					
1	UXXX XXX3	University Elective (1 course)			
2	UKKP 0010	Research Methodology			
3	PKKK XX00	Research (Minimum 6 semesters)			
4		Thesis			
5		Publication (minimum one (1) referred article or two (2) indexed conference proceeding accepted as published in SCOPUS/ERA/WOS			

DOCTOR OF PHILOSOPHY

FIELD OF RESEARCH: ENVIRONMENTAL ENGINEERING

PROGRAMME SPECIFICATIONS

The Doctor of Philosophy Field of Research: Environmental Engineering (PKKS) is offered on a full-time basis. The duration of study is in between minimum of three

(3) years to a maximum of eight (8) years.

The assessment of the research program is based on the progress report, supervisor's evaluation, research proposal and viva.

General Information

1. Awarding Institution			Universiti Teknologi Malaysia
2. Teaching Institution			Universiti Teknologi Malaysia
3. Programme Name			Doctor of Philosophy
4. Final Award			Doctor of Philosophy Field of research: Environmental Engineering
5. Programme Code			PKKS
6. Professional or Statutory Body of Accreditation			MQA
7. Language(s) of Instruction			English
8. Mode of Study (Conventional, distance learning, etc)			Research
9. Mode of operation (Franchise, self-govern, etc)			Self-governing
10. Study Scheme (Full Time/Part Time)			Full Time
11. Study Duration			Minimum : 3 years Maximum: 8 years
Type of Semester	No. of Semesters		No of Weeks/Semester
	Min	Max	
Normal	6	16	14
Short	-		-

Course Classification

No.	Classification	Credit Hours	Percentage
i.	University Elective (1 course)	3	
ii.	Research Methodology	HW	

iii.	Research (Minimum 6 semesters)	0	
iv	Thesis	0	
	Total	**3**	

Programme Educational Objectives (PEO)

PEO 1 Graduates are able to in-depth knowledge in environmental engineering related areas.
PEO 2 Graduates are able to formulate, solve and conduct problems through effective and critical thinking skills.
PEO 3 Graduates are able to organize relevant knowledge and expertise through effective oral and written communications.
PEO 4 Graduates able to develop relevant knowledge, promote professional and ethical responsibilities including contemporary issues and environmental awareness.

Programme Learning Outcomes (PLO)

PLO 1 Incorporate continuing and advanced knowledge in environmental engineering related areas.
PLO 2 Formulate hypothesis, design and reorganize experiments/research scientifically to solve and evaluate observed phenomena.
PLO 3 Analyze and evaluate critically problems in related areas through effective thinking skills, particularly in situations with limited information and to provide solutions through the application of appropriate tools and techniques.
PLO 4 Display ideas and technical findings in both written and oral forms effectively.
PLO 5 Plan and perform research undertakings professionally, ethically and responsibly.
PLO 6 Perform lifelong learning for the needs of continuing professional development.

GRADUATION CHECKLIST

To graduate, students must pass all the stated courses and assessment in this

checklist. It is the responsibility of the students to ensure that all courses and assessment are taken and passed. Students who do not complete any of the assessment are not allowed to graduate.

NO.	CODE	COURSE	CREDIT EARNED (JKD)	CREDIT COUNTED (JKK)	TICK (√) IF PASSED
SCHOOL OF CHEMICAL & ENERGY ENGINEERING COURSES					
1	UXXX XXX3	University Elective (1 course)			
2	UKKP 0010	Research Methodology			
3	PKKS XX00	Research (Minimum 2 semesters)			
4		Thesis			
5		Publication (minimum one (1) referred article or two (2) indexed conference proceeding accepted as published in SCOPUS/ERA/WOS			

DOCTOR OF PHILOSOPHY

FIELD OF RESEARCH: GAS ENGINEERING

PROGRAMME SPECIFICATIONS

The Doctor of Philosophy Field of Research: Gas Engineering (PKPG) is offered on a full-time basis. The duration of study is in between minimum of three (3) years to a maximum of eight (8) years.

The assessment of the research program is based on the progress report, supervisor's evaluation, research proposal and viva.

General Information

1. Awarding Institution			Universiti Teknologi Malaysia
2. Teaching Institution			Universiti Teknologi Malaysia
3. Programme Name			Doctor of Philosophy
4. Final Award			Doctor of Philosophy Field of research: Gas Engineering
5. Programme Code			PKPG
6. Professional or Statutory Body of Accreditation			MQA
7. Language(s) of Instruction			English
8. Mode of Study (Conventional, distance learning, etc)			Research
9. Mode of operation (Franchise, self-govern, etc)			Self-governing
10. Study Scheme (Full Time/Part Time)			Full Time
11. Study Duration			Minimum : 3 years Maximum : 8 years
Type of Semester	No. of Semesters		No of Weeks/Semester
	Min	Max	
Normal	6	16	14
Short	-		-

Course Classification

No.	Classification	Credit Hours	Percentage
i.	University Elective (1 course)	3	
ii.	Research Methodology	HW	
iii.	Research (Minimum 6 semesters)	0	
iv	Thesis	0	
	Total	**3**	

Programme Educational Objectives (PEO)

1. Graduates effectively incorporate the in-depth scholarship of gas engineering knowledge, research and problem solving skills to formulation and solution of diverse gas engineering problems taking into account safety, environmental, economic and societal impacts.
2. Graduates communicate effectively to convey and acquire technical ideas, information, and recommendations in a multi-disciplinary environment.
3. Graduates responsibly practice professional ethics with appreciation for the value of continuing professional development in maintaining their professional competence.

Programme Learning Outcomes (PLO)

1. Able to demonstrate an in-depth scholarship of their area of research in gas engineering.
2. Able to contribute to original research to broaden the boundary of knowledge in gas engineering through thesis or dissertation
3. Able to make critical analysis, evaluation and synthesis of new ideas in research problems related to gas engineering
4. Able to plan and perform independent research undertakings professionally, ethically and responsibly, and to lead research projects
5. Able to report research findings to peers at levels suitable for international publications
6. Able to recognize the needs for continuing professional development

GRADUATION CHECKLIST

To graduate, students must pass all the stated courses and assessment in this checklist. It is the responsibility of the students to ensure that all courses and assessment are taken and passed. Students who do not complete any of the assessment are not allowed to graduate.

NO.	CODE	COURSE	CREDIT EARNED (JKD)	CREDIT COUNTED (JKK)	TICK (√) IF PASSED
SCHOOL OF CHEMICAL & ENERGY ENGINEERING COURSES					
1	UXXX XXX3	University Elective (1 course)			
2	UKKP 0010	Research Methodology			
3	PKPG XX00	Research (Minimum 2 semesters)			
4		Thesis			

5		Publication (minimum one (1) refereed article or two (2) indexed conference proceedings accepted as published in SCOPUS/ERA/WOS)			

DOCTOR OF PHILOSOPHY

FIELD OF RESEARCH: PETROLEUM ENGINEERING

PROGRAMME SPECIFICATIONS

The Doctor of Philosophy Field of Research: Petroleum Engineering (PKKP) is offered on a full-time basis. The duration of study is in between minimum of three (3) year to a maximum of eight (8) years.

The assessment of the research program is based on the progress report, supervisor's evaluation, research proposal and viva.

General Information

1. Awarding Institution	Universiti Teknologi Malaysia
2. Teaching Institution	Universiti Teknologi Malaysia
3. Programme Name	Doctor of Philosophy

4. Final Award			Doctor of Philosophy Field of research: Petroleum Engineering
5. Programme Code			PKKP
6. Professional or Statutory Body of Accreditation			MQA
7. Language(s) of Instruction			English
8. Mode of Study (Conventional, distance learning, etc)			Research
9. Mode of operation (Franchise, self-govern, etc)			Self-governing
10. Study Scheme (Full Time/Part Time)			Full Time
11. Study Duration			Minimum : 3 years Maximum : 8 years
Type of Semester	No. of Semesters		No of Weeks/Semester
	Min	Max	
Normal	6	16	14
Short	-		-

Course Classification

No.	Classification	Credit Hours	Percentage
i.	University Elective (1 course)	3	
ii.	Research Methodology	HW	
iii.	Research (Minimum 6 semesters)	0	
iv	Thesis	0	
	Total	**3**	

Program Educational Objectives (PEO)

PEO 1: Graduates effectively incorporate the in-depth scholarship of petroleum engineering knowledge, research and problem solving skills to formulation and solution of diverse petroleum engineering problems taking into account safety, environmental, economic and societal

impacts.

PEO 2: Graduates communicate effectively to convey and acquire technical ideas, information, and recommendations in a multi-disciplinary environment.

PEO 3: Graduates responsibly practice professional ethics with appreciation for the value of continuing professional development in maintaining their professional competence.

Program Learning Outcomes (PLO)

PLO1: Able to demonstrate an in-depth scholarship of their area of research in petroleum engineering.

PLO2: Able to contribute to original research to broaden the boundary of knowledge in petroleum engineering through thesis or dissertation.

PLO3: Able to make critical analysis, evaluation and synthesis of new ideas in research problems related to petroleum engineering.

PLO4:Able to plan and perform independent research undertakings professionally, ethically and responsibly, and to lead research projects.

PLO5: Able to report research findings to peers at levels suitable for international publications.

PLO6:Able to recognize the needs for continuing professional development.

GRADUATION CHECKLIST

To graduate, students must pass all the stated courses and assessment in this checklist. It is the responsibility of the students to ensure that all courses and assessment are taken and passed. Students who do not complete any of the assessment are not allowed to graduate.

NO.	CODE	COURSE	CREDIT EARNED (JKD)	CREDIT COUNTED (JKK)	TICK (√) IF PASSED
SCHOOL OF CHEMICAL & ENERGY ENGINEERING COURSES					
1	UXXX XXX3	University Elective (1 course)			
2	UKKP 0010	Research Methodology			
3	PKKP XX00	Research (Minimum 2 semesters)			
4		Thesis			
5		Publication (minimum one (1) referred article or two (2) indexed conference proceeding accepted as published in SCOPUS/ERA/WOS			

DOCTOR OF PHILOSOPHY

FIELD OF RESEARCH: POLYMER ENGINEERING

PROGRAMME SPECIFICATIONS

The Doctor of Philosophy Field of Research: Polymer Engineering (PKKR) is offered on a full-time basis. The duration of study is in between minimum of three (3) year to a maximum of eight (8) years.

The assessment of the research program is based on the progress report, supervisor's evaluation, research proposal and viva.

General Information

1. Awarding Institution	Universiti Teknologi Malaysia
2. Teaching Institution	Universiti Teknologi Malaysia
3. Programme Name	Doctor of Philosophy
4. Final Award	Doctor of Philosophy Field of research: Polymer Engineering
5. Programme Code	PKKR
6. Professional or Statutory Body of Accreditation	MQA

7. Language(s) of Instruction			English
8. Mode of Study (Conventional, distance learning, etc)			Research
9. Mode of operation (Franchise, self-govern, etc)			Self-governing
10. Study Scheme (Full Time/Part Time)			Full Time
11. Study Duration			Minimum : 3 years Maximum : 8 years
Type of Semester	No. of Semesters		No of Weeks/Semester
	Min	Max	
Normal	6	16	14
Short	-		-

Course Classification

No.	Classification	Credit Hours	Percentage
i.	University Elective (1 course)	3	
ii.	Research Methodology	HW	
iii.	Research (Minimum 6 semesters)	0	
iv	Thesis	0	
	Total	**3**	

Program Educational Outcomes (PEO)

PEO 1: Graduates are able to incorporate in-depth relevant knowledge in engineering practices.

PEO 2: Graduates are able to apply a wide range of relevant knowledge formulate, conduct and solve problems effectively and innovatively through critical thinking skills.

PEO 3: Graduates are able to communicate effectively to convey and acquire technical information and recomendation intellectually, ethically and professionally.

PEO 4: Graduates able to adopt the latest relevant niche knowledge and technologies through life-long learning process by taking into account safety, environmental, economic and societal impacts

Program Learning Outcome (PLO)

PLO 1: Incorporate continuing and advanced knowledge in polymer engineering related areas.
PLO 2: Formulate hypothesis, design and reorganize research scientifically to solve problems.
PLO 3: Analyze and evaluate problems critically in polymer engineering area, through effective thinking skills particularly in situations with limited information and provide solutions using appropriate tools and techniques.
PLO 4: Display ideas and technical findings effectively in oral and written.
PLO 5: Conduct professional ethics in research with minimal supervision and adhere to legal, ethical and professional code of practice.
PLO 6: Adopt the latest relevant knowledge and technologies through life-long learning.

GRADUATION CHECKLIST

To graduate, students must pass all the stated courses and assessment in this checklist. It is the responsibility of the students to ensure that all courses and assessment are taken and passed. Students who do not complete any of the assessment are not allowed to graduate.

NO.	CODE	COURSE	CREDIT EARNED (JKD)	CREDIT COUNTED (JKK)	TICK (√) IF PASSED
SCHOOL OF CHEMICAL & ENERGY ENGINEERING COURSES					
1	UXXX XXX3	University Elective (1 course)			
2	UKKP 0010	Research Methodology			
3	PKKR XX00	Research (Minimum 2 semesters)			
4		Thesis			
5		Publication (minimum one (1) referred article or two (2) indexed conference proceeding accepted as published in SCOPUS/ERA/WOS			