

Sample Curriculum Preparation

Clarification

Details stipulated herein only serve as examples which have been prepared by the Education Development and Services Office (EDS office). The details of the curriculum can be modified as appropriate, provided that the curriculum covers all topics prescribed by the Office of the Permanent Secretary of the Ministry of Higher Education, Science, Research and Innovation (OPS MHESI). The specific format of the program may vary.



Curriculum..... Program.....

(Multidisciplinary Program) or (Interdisciplinary Program)

Select one based on the nature of the program as specified in Part 2
(2.3.1) Determining learning outcomes b) Program philosophy and objectives

(International Program) or (English Program)

Select one as per the program details submitted to KMUTT by the Faculty

(5 Year Program)

Only applicable to programs with a duration of five years

New Curriculum B.E. or Revised Curriculum B.E.

Select one and specify the year in which the curriculum was proposed to KMUTT by the Faculty

Department/Program..... Faculty.....

King Monngkut’s University of Technology Thonburi

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Part 2 Program design and concept

2.1) Rationale for modification and process involved in defining the concept of the program

Show the analysis of external factors: skill mapping based on domestic demand, the manufacturing/industrial sectors/ employers (labor market), current students, and other important stakeholders, as well as the internal factors, which were then be used in designing the program. The linkage between the foregoing information and the program design and modification as well as the intended learning outcomes should also be demonstrated.]

2.1.1) Voice of Customer (VOC) process and converting VOC to Voice of Production (VOP) for program modification

[Explain the stakeholder engagement process; detail how stakeholder groups and their representatives were selected, including the tools, methods, and time period of the survey and survey results.]

- The program should demonstrate the stakeholder selection process and criteria, including the appropriateness of the selected stakeholders. Stakeholders who are selected as representatives of their respective groups must be able to provide actual information in line with the results which are expected from that particular group.
- The program must reflect the stakeholder engagement process, selection of stakeholder groups and representatives of those groups, including the tools, methods, time period of the survey, and analysis and summary of findings from all survey results.
- Show the linkage between the program and the policies, vision, and mission of KMUTT and the relevant faculty
- The program must also show the conversion from VOC to VOP for program modification

2.1.1.1) Labor Market

Process of conducting surveys to obtain data, ranging from the selection of stakeholders, the appropriate number of representatives, including the use of tools, methods, time period of the survey, survey results and analysis of the findings from the survey results.

2.1.1.2) Current Students

Process of conducting surveys to obtain data, ranging from the selection of stakeholders, the appropriate number of representatives, including the use of tools, methods, time period of the survey, survey results and analysis of the findings from the survey results.

2.1.1.3) Other stakeholder groups

This group comprises, for example, executives, alumni, instructors, and support staff. Show the process of conducting surveys to obtain data, ranging from the selection of stakeholders, the appropriate number of representatives, including the use of tools, methods, time period of the survey, survey results and analysis of the findings from the survey results.

2.1.2) Externalities analysis:

2.1.2.1) Analysis of labor market demand and domestic supply (quantitative)

Analysis and estimates of demand (quantitative) comprises two parts: (1) demand of prospective students; and (2) demand of alumni of the program in the labor market. Show the current and future market demand, including the number of existing curricula or programs in the country similar to the proposed program. [Demonstrate that this program is in demand in the labor market and that it is competitive compared with other comparable programs.]

Examples

Skill Mapping is the process of collating and identifying the necessary skills for a particular work position at hand (demand side) in comparison with the skills that students will attain from the program (supply side) in order to facilitate in national human capital resource planning and designing programs that truly respond to the market demand.

2.1.2.1) Peer benchmarking

[Peer benchmarking is the analysis which involves the identification of peers and competitors in the context of the proposed program, analysis and discussion, and summary of the overview of the program so as to determine the market segment where the program lies and its market positioning. This analysis should also highlight the program's key strengths and intended competitive edge.]

2.1.2.1) Risks and impacts from external factors

These include: technology shifts; policy changes; and shifts in respect of other environmental factors in the global context. This is an analysis of macro-environmental factors which may have an impact on the program and include, for example demography, economic conditions, social conditions, culture, technology, politics, and relevant policies or laws. The objective is to determine areas of opportunity or obstacles from externalities, as well as the potential impacts of those externalities on the program. The program needs to produce graduates whose skills are in line with

the national policy trends, and the mission and strategy of the institution (KMUTT), the latter which corresponds with the national policy trends, and in accordance with higher education grouping.

2.1.3) Internalities Analysis

Internalities analysis refers to the current state analysis of the organization to identify key weaknesses and potential issues of concern in the context of operations which may have an impact on the revision of the program as detailed below.

2.1.3.1) Track record analysis

Analysis of relevant information for at least the past five years, such as the rate of graduation, drop outs, duration of program study, job status of graduates, alumni career advancement (in the case of students who have existing employment), self-evaluations, and other subjects such as a SWOT analysis based on internal environmental factors]

2.2) Product concept of the program

- Demonstrate how the program utilizes survey and analysis results from Item 2.1 for determining program learning outcomes, or which issues were selected for making the proposed program amendments and how;
- How the survey and analysis results from Item 2.1 are utilized to formulate the product concept of the program; comprising:

2.2.1) Qualifications of graduates

2.2.2) Target group

2.2.3) Market positioning

2.2.4) Competitive edge

2.2.5) Revision guidelines/ key revised content

2.3) Program design

- How the product concept of the program (Item 2.2) evolved into the details of the program, comprising:

2.3.1) Program learning outcomes

2.3.1.1) Concept or background or process through which program learning outcomes (PLOs) were determined

Demonstrate how the program, which was based on the analysis of the survey results in Items 2.1 and 2.2, were utilized in determining the program learning outcomes (PLOs) or which issues were taken into consideration for revising the program.

Matters for consideration in the review and certification process:

- Students show change or improvement in different aspects of the PLOs in their course of study and accumulate learning such that they are likely to be confident that they will be able to achieve the overall designated PLOs for the program
- The PLOs based on each level of study must be in accordance with the characteristics of the program, institution of education, profession, and the national and global context. They must consist of at least 4 components: knowledge, skills, ethics, and identity [4 topics under the Teaching Quality Framework (TQF), Clarification and PLOs composition]

2.3.1.2) Philosophy, importance, and key objectives of the program

- Specify the philosophy, importance, and key objectives for introducing a new program (or revising an existing program) (why was the program established? why should it be offered to students?); this philosophy must be in line with the philosophy of higher education and academic/ professional standards or the targeted qualities, knowledge and competencies of graduates which the institution aims to produce
- The program philosophy is the principle to which the program will adhere in producing graduates. This philosophy must correspond with the importance, PLOs, teaching strategies, outcome monitoring and evaluation, and targeted professions following graduation, all of which form the underlying basis for Outcome Based Education (OBE)

2.3.1.3) Program Learning Outcomes (PLOs)

2.3.1.4) Stage Learning Outcomes (Stage-LOS)

- Stage-Learning Outcomes (Stage-LOS) is the process of evaluating student learning outcomes which is conducted in stages and continuously over the course of learning under a program, with the objective of determining whether students achieve the learning outcomes set at each stage. If students do not achieve the relevant level of learning at a particular stage, instructors would then be able to make adjustments to the method of instruction in order to facilitate students to achieve the outcomes linked to that particular stage of learning.
- Stage-LOS set control points or check points for the expected learning outcomes. They are described as overarching learning outcomes which reflect the aptitude or competencies of students which are developed (as a result of learning) from one stage to the next. This should correspond with the CLOs of other courses which students also take at that particular stage. Instructors should be confident that in their final year of study, students will have achieved all PLOs. Stage-LOS do not need to be determined on an annual basis. They may be determined independent of a time period or year of study, provided that the time period and method of evaluation for each stage are specified.

2.3.1.5) Table showing the relationship between program learning outcomes and desired qualifications of graduates of KMUTT (KMUTT student QF), and the learning outcomes under the national standards for higher education

2.3.2) Program and coursework structure design and course

Matters for consideration in the review and certification process:

- The program needs to identify stakeholders and methods for deriving the demand and expectations, which are then utilized for determining PLOs which reflect the demand and expectations of those stakeholders. This needs to cover how the matters are in line with the standards for PLOs and reflect student development targets in the short and long term
- How does the design of the structure of the curriculum, courses or modules relate to the expected PLOs of the program? Do they enable students to develop knowledge, skills, and academic and professional competencies for students in practice?

2.3.2.1) Program product design concept and contents of the program to be used for enabling students to achieve the set PLOs in accordance with the OBEM framework

[Demonstrate the concept of how the PLOs are utilized to design the structure and contents of the courses in the program in a manner that is appropriate for students' development - show how the

program structure, sequence, appropriateness, and integration were derived, as well as what characteristics of the program embody modernity.]

2.3.2.2) Comparison between the structure of the program and the Notification of the Higher Education Standards Committee Re: Standard criteria for curricula at the undergraduate/ graduate level of studies B.E. 2565 (2022)

a) Comparison between the structure of the program and the specifications under the Notification of the Higher Education Standards Committee Re: Standard criteria for curricula at the undergraduate/ graduate level of studies B.E. 2565 (2022)

Category	Number of credits			Difference in number of credits
	Higher Ed criteria	Existing program B.E.25....	Revised program B.E. 25...	
1. Core courses	≥ 24			
2. Specialization courses				
2.1 Specialization.....	≥ 72 (4 ปี)			
2.2 Specialization.....	≥ 90 (5 ปี)			
2.3 Specialization.....				
2.4 Specialization.....				
3. Electives	≥ 6			
Total number of credits	≥ 120			

b) Comparison showing the difference in the courses under the existing program and the revised program [in the case of revision]

Existing program B.E. 256...	Revised Program B.E. 256...	Remarks
List the courses based on their categories as appearing in the program structure	List the courses based on their categories as appearing in the program structure	Clearly specify the changes e.g. changes in the Thai/ English course names, additional number of credits, revised course descriptions, new course offerings, canceling courses, changing the category of courses

List the courses which are available to students outside of the program (if any)	List the courses which are available to students outside of the program (if any)	
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c) Key contents or rationale for the revision [in the case of a revision]

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2.3.2.3) Details of the structure of the program and courses

a) Total number of credits in the program credits

b) Program structure [by category]

- a. Core courses** **31 credits**
- b. Specialization courses** **108 credits**
 - Foundations of Engineering 22
 - Foundations of Science and Mathematics 21
 - Compulsory core courses in Environmental Engineering 56
 - Electives in Engineering 9
- c. Electives** **6 credits**
- d. OBEM**

c) Courses [course call numbers, course names (Thai/ English), number of credits, categories, course descriptions, CLOs] – may be appended

d) Components relating to practical experience [internships/ cooperative education/ WILs/

Practice school] (if any)

- Learning outcomes from fieldwork experience
- Duration
- Number of credits
- Preparation
- Learning management
- Evaluation process

e) Specifications relating to projects or research (if any)

- Learning outcomes
- Duration
- Number of credits
- Preparation
- Learning management
- Evaluation process

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2.3.3) Learning design concept

Organizing the learning process in order to enable students to achieve the set learning outcomes

Matters for consideration in the review and certification process:

- How was the learning process organized in order to enable students to learn , know how to acquire life-long knowledge, and create a growth mindset?
- The learning process needs to ensure that students are able to apply the materials that they had learnt to real-life work in practice and respond to the demand of key stakeholders in line with the expected learning outcomes

2.3.3.1) Learning design concept to improve program learning objectives (PLOs) and course-level learning outcomes

- Explain the learning path and teaching strategies that will be employed in the course of instruction of the different courses in the program such that students would be able to achieve the program learning outcomes. The learning design for the method of instruction and class activities need to be aligned with and appropriate for PLOs and CLOs of the curriculum
- Explain the teaching strategies to be used in the OBEM courses in order to enable students to achieve the learning outcomes
- Explain the learning path and the design concept behind how the strategy for improving learner outcomes were derived. Make sure that the relationship between the PLOs/CLOs, the selected teaching strategies, and the learning evaluations strategies for constructive alignment is demonstrated

2.3.3.2) Learning Path and study plan

Study plan (For recording in the New Acis system)

Year of study	Semester	Course name	Number of credits
XXX	xxx Course name	x(x-x-x)
XXX	xxx Course name.....	x(x-x-x)
Total			x(x-x-x)
Number of hours /week			= x

2.3.3.3) Table showing the relationship between PLOs and CLOs (PLO-CLO curriculum mapping) or other formats

Example

Bachelor's/ Undergraduate level programs should be organized separately by year of study. Graduate degree level programs should be organized by the core requirements and electives and the plan of study, whereby the relevant level of learning outcomes should be designated as numbers of letters.

1.1 Undergraduate/ Bachelor's degree level (by year of study)

Course	PLO 1			PLO 2		PLO 3		PLO 4	
	1A	1B	1C	2A	2B	3A	3B	4A	4B
Semester: 1, Year of study: 1									
XXX xxx	1				1		1		
XXX xxx		2				1		1	
Semester: 1, Year of study: 2									
XXX xxx			2	1					1
XXX xxx			2			2			
Semester: 2, Year of study: 1									
XXX xxx		3							
XXX xxx			3	3					
Semester: 2, Year of study: 2									
XXX xxx	3				3			3	
XXX xxx						3			
Electives									
XXX xxx									

1.2 Graduate/ Master's Degree level (it is recommended that this section be organized by core compulsory courses, electives, and by the plan of study)

Course	PLO 1			PLO 2		PLO 3		PLO 4	
	1A	1B	1C	2A	2B	3A	3B	4A	4B
Plan of study 1.2									
Core courses									
XXX xxx	3				3			3	
XXX xxx						3			

Course	PLO 1			PLO 2		PLO 3		PLO 4	
	1A	1B	1C	2A	2B	3A	3B	4A	4B
Plan of study 2.2									
XXX xxx	3				3			3	
XXX xxx						3			
Electives									
XXX xxx									

2.3.4) Learning evaluations design

Monitoring and evaluation of learning outcomes based on PLOs

Matters for consideration in the review and certification process:

- How were monitoring and evaluation of learning outcomes designed, using the methods, equipment, and credible criteria which reflect the true learning outcomes of students?
- What methods are used in order to review, check, and ensure that the feedback is received and used for improving instruction both for the instructor as well as students. This is for the purpose of ensuring that students achieve the expected PLOs and CLOs.

2.3.4.1) Design concept for monitoring and evaluation of PLOs, CLOs and graduation from the program

- Explain the strategy for the monitoring and evaluation which will be applied for the different courses in the program which will be used to evaluate learning outcomes of students to determine whether they are able to achieve the PLOs. The design concept of the monitoring and evaluation of students must be aligned with and appropriate for the PLOs and CLOs of the program. The monitoring and evaluation method must be accurate, credible (there are monitoring and evaluation standards in place), and fair. The monitoring and evaluation strategy should be designed at the beginning of a course, during a course, and at the end of a course. Include mechanisms for obtaining feedback from instructors in a timely manner in order to utilize the same for improving student learning.
- Demonstrate the steps or process for monitoring, measuring, and evaluating students from time to time/ guaranteeing that students achieving the PLOs upon graduation.
- Explain the strategies for monitoring and evaluation which will be used for OBEM modules in order to enable students to achieve the expected learning objectives.

- Sample rubrics may be added in this section (if any) or included as part of the Appendix section

2.3.4.2) Graduation criteria for the program

Specify the criteria for graduation from the program, such as:

- Compliance with regulations of KMUTT or any conditions other than those prescribed in the regulations of KMUTT (please specify)
- Students achieve all PLOs

The program must contain an explanation of the methods for monitoring and evaluation, as well as evaluation plans, when these will be conducted, the frequency of the evaluations, and time periods of evaluation, etc.

2.3.5) Design concept for supporting materials

2.3.5.1) Preparedness and potential of program instructors and staff

- All program instructors and staff: supervising professors overseeing the program/ program instructors/ teaching support staff/ others
- [The program demonstrates that the program instructors and staff possess adequate competence and preparedness and are able to facilitate students to achieve the set PLOs and are in alignment with other applicable criteria]

[Provide an analysis and evaluation which shows that program instructors and staff possess adequate preparedness to enable students to achieve the set PLOs and are in alignment with other required applicable criteria]

Matters for consideration are:

- The quantity of program instructors and staff is complete and in accordance with the applicable criteria.
- The qualifications, characteristics, and competencies of the program instructors and staff are aligned with all prescribed criteria and the policies of KMUTT, the Faculty and the Department.
- The ratio between the number of program instructors and staff to the number of students is appropriate (compared with the standard criteria of the Office of the Permanent Secretary of the Ministry of Higher Education, Science, Research and Innovation (OPS MHESI))

- The qualifications, characteristics, competencies, knowledge and expertise of the program instructors and staff are in accordance with the requirements of the program, which facilitates students to achieve the PLOs etc.

- Development guidelines for program instructors and staff

[The program has a selection, nomination, management, monitoring, evaluation and guidelines for the development of new and existing program instructors and staff for the purposes of quality assurance and to ensure that the program will enable students to achieve the PLOs.]

Matters to be considered:

- Guidelines for the selection and nomination of program instructors and staff
- Guidelines for preparations for new program instructors and staff
- Guidelines for the promotion and development of knowledge and skills for new and existing program instructors and staff
- Measurement and evaluation of the capacity of program instructors and staff etc.

2.3.5.2) Facilities & Infrastructure management and student support services

[The program shows the format of facilities and infrastructure management and how student support services are prepared to facilitate the development of learning to enable students to achieve the PLOs]

Matters to be considered:

- Student support facilities and services (which can comprise key resources or specialized equipment necessary for the program) which facilitate learning to enable students to achieve the PLOs
- Assessment of the adequacy and readiness of the facilities & infrastructure and student support services which will help promote the set learning outcomes, such as whether they are adequate considering the number of students, whether students are able to gain easy access to the same, and whether services, facilities and infrastructure are appropriate, and funding is adequate.
- The management plan for facilities & infrastructure and student support services must be able to ensure that the supporting materials and services are prepared and adequate for students at all times.

2.3.5.3) Management of income and expenses of the program (program budget)

a) 5-year plan for admissions and graduates

- Number of students based on the program plan (for consideration by the Office of the Ministry of Higher Education, Science, Research and Innovation)

Details	2023	2024	2025	2026	2027
1.1 Master's Degree Candidates					
1 st year	2	2	2	2	2
2 nd year	-	2	2	2	2
3 rd year	-	-	2	2	2
Total	2	4	6	6	6
2.1 Master's Degree Candidates					
1 st year	2	2	2	2	2
2 nd year	-	2	2	2	2
3 rd year	-	-	2	2	2
Total	2	4	6	6	6
Total for all plans	4	8	12	12	12
Prospective graduates	-	-	4	4	4

- Total number of students in the program (for KMUTT consideration)

Details	2023	2024	2025	2026	2027
1.1 Master's Degree Candidates					
1 st year	2	2	2	2	2
2 nd year	1	2	2	2	2
3 rd year	1	1	2	2	2
Total	4	5	6	6	6
2.1 Master's Degree Candidates					
1 st year	2	2	2	2	2
2 nd year	1	2	2	2	2
3 rd year	2	1	2	2	2

Total	5	5	6	6	6
Total for all plans	9	10	12	12	12
Prospective graduates	3	2	4	4	4

b) Plan budget

- Tuition (For announcement of the adjusted tuition rates)
- Income (Unit: THB)
- Expenses (Unit: THB)

2.3.6) Mechanisms for modifying and improving the program for quality assurance purposes

2.3.6.1) Quality assurance

2.3.6.2) Graduates

2.3.6.3) Students

2.3.6.4) Professors

2.3.6.5) Program, teaching and evaluations

2.3.6.6) Supporting materials

2.3.6.7) Risks

Matters for consideration in the review and certification process:

- Quality planning, quality control, and management of risks which may arise during the operation of the program, as well as the ways in which complaints and appeals are handled
- How the program uses the data from the course evaluations for review and quality improvement purposes so as to enable students to achieve the standard learning outcomes prescribed and such that employers of graduates are confident that they will gain personnel with the appropriate competencies in line with their demand
- What methods are used for the communication and dissemination of course information to key stakeholders for acknowledgment

- The program explains the mechanisms or processes for quality assurance **which are conducted by the program itself**, whereby such explanation covers all issues such as those relating to graduates, students, the program, instruction, classes, etc. in order to ensure that students achieve the PLOs
- The process for quality assurance should show which activities will be conducted, how they will be conducted, when they will be conducted, who will be responsible for conducting the same, and how the results from the activities will be utilized going forward, how the review and assessment process is conducted; The aforementioned process must be **practicable** in order to continuously revise and improve quality, as well as to enable accommodation of post auditing by external auditors.
- Post auditing will be conducted with the goal being to seek control processes that ensure the achievement of learning outcomes in practice, as well as monitoring processes to allow for continuous improvements in order to achieve the set learning outcomes: (1) learning outcomes for students and graduates; (2) compliance with the post audit management as designed; and (3) continuous quality revision and improvement.
- **Quality assurance** means the conduct of activities or core missions in a systematic manner as designed by a plan, whereby quality control, quality auditing and quality assessments are conducted in order to gain confidence in the quality and standards of indices for assessing manufacturing systems and processes, products and results of the program

- **Internal Quality Control** is the core component which the program must integrate into its system.

The internal control mechanisms applicable to various components of the organization which will have an impact on the quality of graduates must be conducted in a systematic manner using appropriate internal control principles. The program must also have in place a system for monitoring and assessing internal controls.

- **Quality Auditing** means conducting auditing the operations of the system and internal control mechanisms which are put in place by the program. This is a systematic auditing process which is focused on determining whether the system has quality control systems in place, the extent to which it is used, and whether there are processes which lead one to reasonably believe that teaching is of high quality.

- **Quality Assessment** means the process of assessing the conduct of the overall program to determine the extent of quality change following the implementation of the quality assurance or quality control system.

The auditing and assessment of quality must be conducted in a systematic manner, subject to clear criteria and guidelines.

- **Suggestions:** The program should establish a plan for revising and improving the program for the purposes of quality assurance as follows:
 1. Specify the components or issues of the program for quality control
 - Components or issues for quality assurance are: graduates, students, professors, program, teaching, student evaluations, supporting materials, and overseeing of compliance with standards of the program, etc.
 - The determination of the components or issues for quality assurance may be considered based on the steps involved in the development of the program, ranging from program design, instruction, monitoring and evaluation, revising and improving the program, and program output & outcome.
 - The determination of components or issues for quality assurance may be considered from the program systematic processes, ranging from:
 - Inputs – quality assurance of inputs which will drive program quality, for example, students, professors, staff, and student support services etc.
 - Process – quality assurance of processes in implementing work in accordance in the set plan, namely the teaching and service provision (ranging from teaching and learning design, organization of learning activities, monitoring and evaluation of learning outcomes, and feedback assessments for improvement purposes)
 - Output & Outcome – quality assurance of the output and outcomes from operation of work, e.g. competencies of graduates, learning outcomes, employment rates, career advancement, and employee satisfaction etc.
 2. Identify the mechanisms or processes for quality control with respect to the various prescribed components
 3. Establish a system for auditing the performance of the internal control process
 4. Establish a process for program performance auditing
 - **Risk** is the probability that errors, damage, leaks, loss or undesirable events or acts which may occur under uncertain conditions. This may potentially occur in the future and may also have an impact on or lead to unsuccessful performance thus causing the inability to achieve the set program objectives and targets in terms of strategy, operations, finance, and management. Risks may also have an impact on the program survival as a whole.
 - **Program risks** are for example: the program is shut down, students do not apply to the program or the number of students successfully enrolling in the program is lower than the target number of enrolled

students, there are new competitors in the market, the program content is out of date thus it fails to meet the then current demand, program instructors (professors) resigned mid-semester, program instructors are unable to teach classes in accordance with the program, graduates fail to obtain jobs (due non-alignment with market demand), or many students fail or drop out of the program, etc.

○ **Risk Management** – the process of the program which is systematic and continuous in order for the organization to able to reduce grounds which are likely to cause damage, such that the seriousness of the potential damage and extent of such potential damage are maintained at a level that is acceptable for the program and which may be assessed, controlled and audited in a systematic manner, whereby the achievement of the program-level objectives (PLOs) or targets must be taken as core considerations.

Examples

Component: Students

1.1) Admissions and prerequisites before commencing studies

Mechanisms or process for admissions and prerequisites before commencing studies in the program:

The program has in place processes for admitting students for enrolment in accordance with the criteria of KMUTT. An average GPA and interviews requirements must be included, whereby an interviewing committee must be established, and students must be assessed and evaluated to determine whether they need to take additional preparatory courses before commencing studies in the program, and if so, which courses they need to take. This process also includes an initial assessment of the educational certificates, whereby the program has set in place clear criteria for and topics covered in interviews. There is a website which provides relevant information and points of contact for inquiries, and guidelines and public relations efforts for advertising the program to target students is disseminated. The target students are: students with a background in science, engineering, pharmaceutical science, or other relevant subjects, depending on the consideration of program committee. Moreover, the program has in place measures for preparing students prior to commencing their studies as follows:

- Procure that preparatory courses are offered to students to ensure that they are provided with additional preparation in areas which are lacking. If students are experiencing learning difficulties during the said preparatory courses, extracurricular activities are organized with the goal of providing additional knowledge training for students, whereby these activities are dependent on the learning assessments on the skills areas which students are lacking or lagging in preparedness;
- Moreover, the program has in place extracurricular activities during the entire period of study of students, such as programs for bolstering mathematics skills, English courses, journal clubs, research pitching competitions, and external site visits relating to bioengineering research;
- The program has in place activities to promote and increase the efficiency of learning through various types of practical training;
- The program supports students to seek exchange opportunities at laboratories in external agencies located in Thailand and overseas, and organizes initiatives that are designed to help students publicize their work at national academic conventions, etc.

All of the aforementioned programs and activities are initiatives which demonstrates how the program endeavors to enable students to increase their knowledge base, improve competencies, and skills in academia and in the context of the society.

Monitoring and evaluation:

The program has in place activities for analyzing and evaluating the admission of students in each academic year (once a year), once the selection process of students is complete. A working committee for admissions is established. The working committee will jointly analyze and assess the capacity for admitting students after the selection process is complete, based on the consideration of: the different channels for accepting applications to determine whether the

program would be able to take on a total number of students which is in line with their admissions targets (includes consideration of both the number of admitted students and their qualifications); whether the selection process is appropriate; what problems arose in that process; and these results will be utilized for revising the guidelines and planning for the next round of admissions in the following academic year, as well as information for improving the program going forward.

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Part 3 Program Specifications

- 1) **Course code:** 14-digit code in CHECO.....
- 2) **Program name** (Thai) : Bachelor of Engineering Program in Environmental Engineering
(English) : Bachelor of Engineering Program in Environmental Engineering
- 3) **Degree and program (Thai/ English)**
 - 3.1 Full name (Thai) : Bachelor of Engineering (Environmental Engineering)
(English) : Bachelor of Engineering (Environmental Engineering)
 - 3.2 Abbreviation (Thai) : WorSor.Bor. (Environmental Engineering)
(English) : B.Eng. (Environmental Engineering)
- 4) **Major (if any):** None
- 5) **Total number of credits in the program:** 145 credits
- 6) **Structure:** 4-year or 5-year undergraduate (Bachelor's) program/ 2-year graduate (Master's) program under Plan / 3-year Ph.D. program under Plan or 5-year Ph.D. program under Plan
- 7) **Type:** Academic or Professional or Technical Bachelor's Degree / Academic or Professional Master's Degree/ Academic Ph.D. Degree
- 8) **Language of instruction**
The language of instruction is Thai, with textbooks and supporting course materials in English and/or Thai.
- 9) **Inter-school collaborations**
A program specific to the institution which is being taught directly by the institution
or A program which is organized in collaboration with another institution as follows:
 - MOU-based collaboration:
 - Non-MOU based collaboration:

Specify whether this is a program specific to the institution which is being taught directly by the institution or one which is organized in collaboration with another educational institution/ agency under an MOU. The name of the educational institution / agency collaborating under an MOU must be specified. In the case of a collaboration under an MOU, supporting documentation should be appended, and the said MOU shall not have expired.

- 10) **Conferring degrees**

Specify whether the degree comprises a single focus area or multiple focus areas (in the case of a dual-degree program) or other degrees completed during the course of the program, or a joint degree program with another higher education institution which has an existing MOU with KMUTT

11) Location of instruction

Faculty of Environmental Engineering, Engineering Department, KMUTT

12) Dates and times of instruction / paste the academic calendar using the existing form

Business hours (Mon – Fri, 08.30 am – 4.30 pm)

The date and time of instruction may be subject to change as appropriate.

Academic calendar

Semester 1 August – December

Semester 2 January – May; and

Special teaching period: June – August (if any)

Clearly specify the dates and times of instruction and designate all semesters during which the program is offered. The first and last month in which the program is offered must be clearly specified as follows:

Example

- Business hours (Mon – Fri, 08.30 am – 4.30 pm) and

- Outside of business hours (Mon – Fri, 6 pm – 8 pm and Sat – Sun, 09.00 am – 6 pm)

The date and time of instruction may be subject to change as appropriate

Academic calendar

Semester 1: August - December

Semester 2: January – May with a special teaching period between June and August (if any)

13) Educational system / use the existing form

The system divides each year of study into two semesters for full-time studies. Each semester has a duration of at least 15 weeks, whereby the mode of instruction comprises in-person classroom settings and/or the use of electronic media.

14) Full name, position and educational qualifications of the supervising professor overseeing the program (add * Program Director)

No.	Full Name	Educational qualifications (focus area), Educational institution, country (graduation year)

		(Organize by highest level of qualification to Bachelor's degree level of studies)

15) Qualifications of prospective students

1. Specify whether “Thai students” or “international students” or “Thai and international students” are eligible for enrolment
2. Specify the qualities and qualifications of the target students of the program, whereby the expected qualities and qualifications must be adequate to enable students to graduate in accordance with the curriculum
3. Qualities and qualifications of prospective students may be separate based on each plan of study

.....

16) Status and consideration/approval of the program

New program ⇒ Scheduled to commence (month)..... Year

Semester..... Academic year.....

Revised program ⇒ Scheduled to commence (month)..... Year

Semester..... Academic year.....

- Instruction began since (year).....specify the year in which the instruction of the program began.....
- Revised from the program (name)..... Subject..... New program/ revised program B.E. specify the name of the program/ subject and the year of the existing program prior to the revision

Considered by the Academic Council at Meeting No./.....

Date..... Month..... Year

Approved by the University Council at Meeting No.....

Date..... Month..... Year

The central administration of KMUTT will add information based on the consideration of the Academic Council and University Council after the program has been duly approved by the University Council

17) Preparedness for publication of a high-quality, standardized program

The department is prepared to engage in the publication of a high-quality, standardized program in accordance with the standards for higher education qualifications B.E. 2565 (2022)

Academic year

The publication period should have a duration equivalent to half of the duration of the program (at the beginning of the year of study)

For revisions which will become effective 1/2023, the “Year of publication” should be designated as per the following guidelines:

Bachelor’s Degree/ Undergraduate 4 year program = 2025 Academic Year or 5 year program = 2026 Academic Year

Master’s Degree/ Graduate 2 year program = 2024 Academic Year

PhD Program 3-5 year program = 2025 Academic Year

18) Possible career pathways following graduation

- (1)
- (2)
- (3)

Possible career pathways following graduation must be aligned with the program objectives and should be the core targeted profession for the program

Part 4 Appendix

- Appendix A Opinion of the external expert and suggestions
- Appendix B Program course descriptions
- Appendix C Background of program instructors and staff
- Appendix D Order appointing the committee for curriculum modification/ improvement
- Appendix E KMUTT Regulation on Undergraduate / Graduate Studies
- Appendix F Inter-school collaborations (if any)

Appendix A Opinion of the external expert and suggestions

Opinion of the external expert and suggestions

- Summary of the opinion of the external expert and their suggestions
- Specify clearly which parts need to be revised, where revisions were made, and report reflecting the quality of the teaching path in the program. The program must be aligned with the suggestions of the external expert.

Example

Full name

Position

Department

Expert in (field name) ... *(role of the expert as approved by the University Council, such as Academics)* ...

Approves the program, but has the following suggestions:

Suggestions	Program action
<p>Information which should not be included, as they are suggestions which do not reflect the quality of teaching, such as:</p> <p>1. The course name for course code number xxx123 or 23 does not match the name on page 145</p> <p>2. Many spelling errors were found</p>	<p>1. All inconsistencies have been rectified</p> <p>2. All spelling errors have been rectified</p>
Suggestions	Program action
<p>Good examples to be followed such as the program should provide training on communications skills and presentation skills to students</p>	<p>Courses XXX and YYY have been added to the program. These courses aim to provide students with training on presentation skills. All courses in the program have been requested to integrate presentations as part of the course component in order to help students improve their communications and presentation skills.</p>

Appendix B Program course descriptions

Program Course Details

Course code

Course name (Thai):

(English):

Number of credits: 3(3-0-6)

Category: Core requirement.....

Prerequisites: None

Course description: (Thai and English)

.....

Course-level Learning Outcomes (CLOs):

1.

2.

PLOs development by course level: (alignment with curriculum mapping)

OBEM Path: None / Yes OBEM modules as per the following details:

OBEM Course Code.....

OBEM Module 1 Name (Thai):

(English):

Learning outcomes of OBEM 1:

Percentage of all courses the module equates to:

OBEM Course Code

OBEM Module 2 Name (Thai):

(English):

Learning outcomes of OBEM 2:

Percentage of all courses the module equates to:

OBEM Course Code

OBEM Module 3 Name (Thai):

(English):

Learning outcomes of OBEM 3:

Percentage of all courses the module equates to:



Appendix C Background of program instructors and staff

Background of the professor [professor overseeing the program and program instructors]

Full Name (Thai)

Full Name (English)

1. Educational background

Year (B.E.) Ph.D. (.....), University....., Thailand

Year M.S. (.....), University of, U.S.A.

Year B.S. (.....), University of, U.S.A.

Qualifications and focus area

- Qualifications and focus area match the subject matter of the program
- Qualifications and focus area are related to the subject matter of the program (please explain)

.....

For instructors with qualifications and experience in subject areas which are related to the subject matter of the program, provide supporting information **such as**:

- Expertise in fermentation, animal cell culture and virus clearance, which is related to the research topics under the program
- Expertise in postharvest pathology, microbiology, food safety, and molecular biology in plant pathology, with the ability to advise on research works under the program

2. Highlight of Academic work over the past five years

Group 1 **Research** (specify the database from which information can be retrieved under the Notification of the HEC, such as scopus or web of science)

1.1 International journal (Weight: 1)

.....

1.2 National Journal (Weight: 0.4)

.....

1.3 International Conference (Weight: 0.4)

.....

1.4 National Conference (Weight 0.2)

.....

Group 2 Academic work of other types

2.1 Academic work in the field of Industry/ industrial development

.....

2.2 Academic work for teaching and learning development

.....

2.3 Academic work for public policy development

.....

2.4 Case studies

.....

2.5 Translations

.....

2.6 Dictionaries, encyclopedia, directories and other academic works of a similar nature

.....

2.7 Creative works in the field of Science and Technology

.....

2.8 Aesthetics, arts and creative works

.....

2.9 Patents

.....

2.10 Software

.....

Group 3 Academic works for community service

.....

Group 4 4.1 Textbooks

.....

4.2 Books

.....

4.3 Academic articles

.....

Recommendations

- Highlight 3-5 work achievements related to the subject and which are up-to-date
- Information should be complete and in accordance with citation principles. Refer to the academic citation manual on the EDS website for guidance.
- Achievements highlighted under this section and the disclosure of the same should be in the format as prescribed under the Notification of the Higher Education Commission (HEC)
- Work achievements under 1.1-1.4 must specify the database from which information can be retrieved under the Notification of the HEC, such as scopus or web of science.
- Clearly categorize the work achievement types based on the types of academic work annexed to the Notification of the HEC Re: Criteria and Methods for Consideration and Appointment of Candidates for the Position of Assistant Professors, Associate Professors and Professors.

3. Scope of work

3.1) Current scope of work

- Scope of work at the undergraduate/ graduate level (includes projects/ theses/ independent research)

Course code	Course name	Credits	Hours of instruction/ year of study (estimates)

- Other work responsibilities (if any)

.....

3.2) Scope of work for the program

- Scope of work at the undergraduate/ graduate level (includes projects/ theses/ independent research)

Course code	Course name	Credits	Hours of instruction/ year of study (estimates)

Appendix C Background of program instructors and staff

List of staff in the program [Support staff under 2.3.5.1, such as operational office staff/ arena staff/ professional technician instructors]

No.	Full name	All educational background information	Scope of work	Describe any work experience/ expertise relevant to the courses in this program