WP 2 - Curriculum Development I: Curriculum Structure and Courses

Outcome 2.5 – Preparation for Accreditation of the curriculum

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1. Executive Summary

Task 2.5 in the MSIE4.0 project is about preparation for accreditation of the curriculum. That means the MSc in IE curriculum will be accredited by appropriate regulator on each partnering Thai university. The accreditation would be result of individual attempts, starting with curriculum acceptance at faculty and university levels and preparation of formal application. In this project, all Thai partners cannot launch this MSIE 4.0 curriculum as a new one. However, all of them, confirm to revise their existing curricula and put most of the courses in the revised ones.

For the progress of the curriculum accreditation, at the end of the project, only KMUTNB had finished a major revision of the existing curriculum since June 2020, and the admission using the revised curriculum (MSIE4.0) already done since August 2021. Only the "Digital Factory was added to the revised curriculum since the MSIE4.0 curriculum has not yet completed. However, KMUTNB will put all of the courses in the MSIE4.0 curriculum to the revised curriculum once the MSIE4.0 curriculum is completed. Additionally, three Thai universities, including Prince of Songkla University (PSU), Khon Kaen University (KKU), and Chiangmai University (CMU) are in the process of revising their existing curriculum. They plan for graduate admission next semester (June 2021). At the end of the project, PSU will be completely reviewed by the faculty board. KKU will be completely reviewed by the Graduating committee, while CMU is in the process of preparing the document to propose to the Pre-screening committee. However, for the other Thai universities including Asian Institute of Technology (AIT) and Thammasat University (TU), they have the plan to implement the MSIE4.0 curriculum as well. AIT will have the new submission plan for approval which is expected to be in January 2021 for August 2021, while TU plan for admission with the revised curriculum (MSIE4.0) in May 2022. As for EU partners the outcome of the project, namely MSIE4.0 curriculum, is being considered for complex or partial implementation. CUT, one of European partners, is preparing new Master curriculum on Quality and Production Management that would be based on MSIE4.0 curriculum. Additionally, CUT includes also some courses from MSIE4.0 in curriculum on Design and Project Management. The planned date to finish up with faculty, university and Ministry of Education accreditation is September 2021 for both of the programs. This date is also marking the launch of the programs for students. UPB is currently working on a new master program (its intended name is Applied Informatics in Industrial Engineering) in which the MSIE4.0 curriculum would be used as major source of courses and reference point for general structure. The new program is intended to start in October 2021.

2. Introduction

In this project, Task 2.5 in the MSIE4.0 project is about preparation for accreditation of the curriculum. That means the MSc in IE curriculum will be accredited by appropriate regulator on each partnering Thai university. The accreditation would be result of individual attempts, starting with curriculum acceptance at faculty and university levels and preparation of formal application. In this report, various sections are presented; curriculum approval Procedure of Thai university, progress to implement the MSIE4.0 curriculum, timeframe for achieving accreditation, and conclusion. Details on each section are presented below.

3. Curriculum Approval Procedure of Thai University

In Thailand, the both existing and new curriculum must be approved from the Higher Education Commission (OHEC) and the Office of the Civil Service Commission. The existing curriculum must be revised every 5 years. Steps taken for achieving accreditation for major curriculum revision are similar consisting of 3 main steps which are (1) Faculty review, (2) university review, and (3) the Higher Education Commission (OHEC) and Office of the Civil Service Commission review. The process begins with a school informing a university academic council about a curriculum revision, and submitting the member list of the curriculum development committee for approval. The committee will revise the curriculum and submit to a school academic committee for approval. The curriculum is then sent to committees at the university level starting from a curriculum development screening committee, followed by the academic council and a university council respectively. After achieving internal approval, the curriculum is submitted to the Office of the Higher Education Commission, Ministry of Higher Education, Science, Research and Innovation for accreditation.

Even though steps taken for achieving accreditation for major curriculum revision are similar, each university may have different committees for both faculty and university review levels. For example, the process to obtain a curriculum approval of KKU, TU, and KMUTNB is presented in Figure 1, while that of PSU and AIT is shown in Figures 2 and 3, respectively. From Figure 1, the process is begun with the curriculum development committee deliver the curriculum (both new and existing curricular) to the faculty committee to review. If the curriculum meets all criteria, then it is screened by the university committee before submitting to the educational council for review. If the curriculum meets all standards, it is approved by the university council. The final stage is the Higher Education Commission (OHEC) and the Office of the Civil Service Commission review. Recognition and recommendation from the OHEC may be required. If the curriculum meets all requirements, it is approved by the OHEC and received the letter of degree verification by the Office of the Civil Service Commission. Normally, OHEC will approve the curriculum and the Office of the Civil Service Commission issues the letter of degree

verification within 2 years. During achieving approval from the OHEC, the university can open for graduate admission.

For Asian Institute of Technology (AIT), the process is slightly different. The process is completed internally. The revised curriculum can be offered after receiving approval from the institute academic senate. Approval from the Office of the Higher Education Commission is not required.

4. Progress of the MSIE4.0 curriculum implementation

4.1. Thai Partners

Regarding the implementation of the developing curriculum, the majority of the project partners confirm their commitment to implement the curriculum. Due to the regulation on the number of faculty members assigned solely for a curriculum, all Thai partners cannot launch the MSIE 4.0 curriculum as a new one. However, all of them, confirm to revise their existing curricula and put most of the courses in the revised curricula. Since the process of curriculum revision will take time. The Thai partners will first introduce some courses as elective courses or special topic courses in their current curricula to show their strong commitment.

For the progress of implementing the MSIE4.0 curriculum, presently, only KMUTNB had finished a major revision of the existing curricula since June 2020 and the admission implementing the revised curriculum (MSIE4.0) already done since August 2021. However, only the Digital Factory was added to the revised curriculum since the MSIE4.0 curriculum has not yet completed. KMUTNB will put all of the courses in the MSIE4.0 curriculum to their revised curriculum once the MSIE4.0 curriculum is completed. While three Thai universities, including Prince of Songkla University (PSU), Khon Kaen University (KKU), and Chiangmai University (CMU) are in the process of revising their existing curriculum. They plan for graduate admission next semester (June 2021). However, for the other Thai partners including Asian Institute of Technology (AIT) and Thammasat University (TU) have the plan to implement the MSIE4.0 curriculum as well.

The details of Partner university plans and progress on accreditation are summarized as follows:

- **AIT:**

For AIT, the initial plan was to submit the revised curriculum for approval in January 2020 and offer to new students in August 2020. Unfortunately, the AIT team could not execute as planned due to the document of the curriculum was not available at that time because of the long delay of the outcomes 2.1 and 2.2. Besides, the unexpected COVID-19 pandemic has affected significantly on the other parts of the project requiring the AIT team to take prompt actions to bring the project back on track. As a result, the plan has been on hold. However, two courses from the curriculum have been offered in August 2020 to new students as planned. Furthermore, AIT will continue to offer the other courses from the curriculum in the coming

January 2021 and August 2021 semesters. The new submission plan for approval is expected to be in January 2021 for August 2021.

- **Thamasat University (TU)**

Since the existing curriculum is still valid, TU will do a major revision of the existing curricula in March 2021 and will put most of the MSIE 4.0 courses in the revised curriculum. They plan for admission with the revised curriculum (MSIE4.0) in May 2022. Timeframe for achieving accreditation is detailed in the next section.

4.2. EU Partners

CUT is actually engaged in preparing two new curricula for MSc: one in Quality and Production Management (QPM) and the second one in Design and Project Management (DPM). New curriculum of QPM will be based on MSIE4.0 curriculum, would include most (or even all) of the courses developed in MSIE4.0 project and would be prepared in both Polish and English languages. The accreditation process of MSc QPM should go through Faculty of Management board and its Business Advisory Council, University Commission for Studying Programs and University Senate, and finally should be accepted by Ministry of Science and Education. It is estimated that all the accreditation steps should be completed by September 2021 that would enable recruitment of students for academic year of 2021/2022. The second program on DPM would include only product design oriented courses from MSIE4.0 curriculum (4 courses) and would be developed within similar scheme as QPM program.

UPB is currently working on a new master program (its intended name is Applied Informatics in Industrial Engineering) in which the MSIE4.0 curriculum would be used as major source of courses and reference point for general structure. The new program is intended to start in October 2021.

UMinho is currently not developing new programs for MSc studies close to Industrial Engineering field of knowledge but would use the partial outcomes of MSIE4.0 to revise its existing curricula and the content and pedagogical approach within existing courses. It has already been the case for pilot tested courses and would be considered further for the next occasion on revising the curricula.

5. Timeframe for achieving accreditation for MSIE4.0 curriculum in partnering Thai Universities

At the end of the project, the partnering Thai universities are categorized into three groups:

(1) the university already revised the curriculum. For this group, only KMUTNB had done a major revision of the existing curricula since June 2020 and the admission of the revised curriculum (MSIE4.0) already done since August 2021. Only the "Digital Factory was added to the revised curriculum.

(2) the universities are preparing the curriculum for accreditation. Three partnering Thai Universities; PSU, KKU, and CMU are currently preparing the curriculum for accreditation. They are in the process of submitting the revised curriculum by putting most of the courses in the MSIE4.0 curriculum for accreditation. Since these three universities may have different committees for both faculty and university review levels, timeframe to complete activities for achieving accreditation may be different. However, all three universities have the same due date for admission implementing the revised curriculum (MSIE4.0) which is June 2021. Considering the complete activity at the end of the project, PSU will be completely reviewed by the faculty board, KKU will be completely reviewed by the Graduating committee, while CMU is in the process of preparing the document to propose to the Pre-screening committee, and

(3) the universities which are about to prepare the curriculum for accreditation. The universities in this group are AIT and TU.

Timeframes for achieving accreditation of partnering Thai University are presented in Table 1 and for CUT in Table 2. As for UPB, since the process of development of new master program has been only launched, there is no detailed schedule yet, but the whole process should be finalized by October 2021.

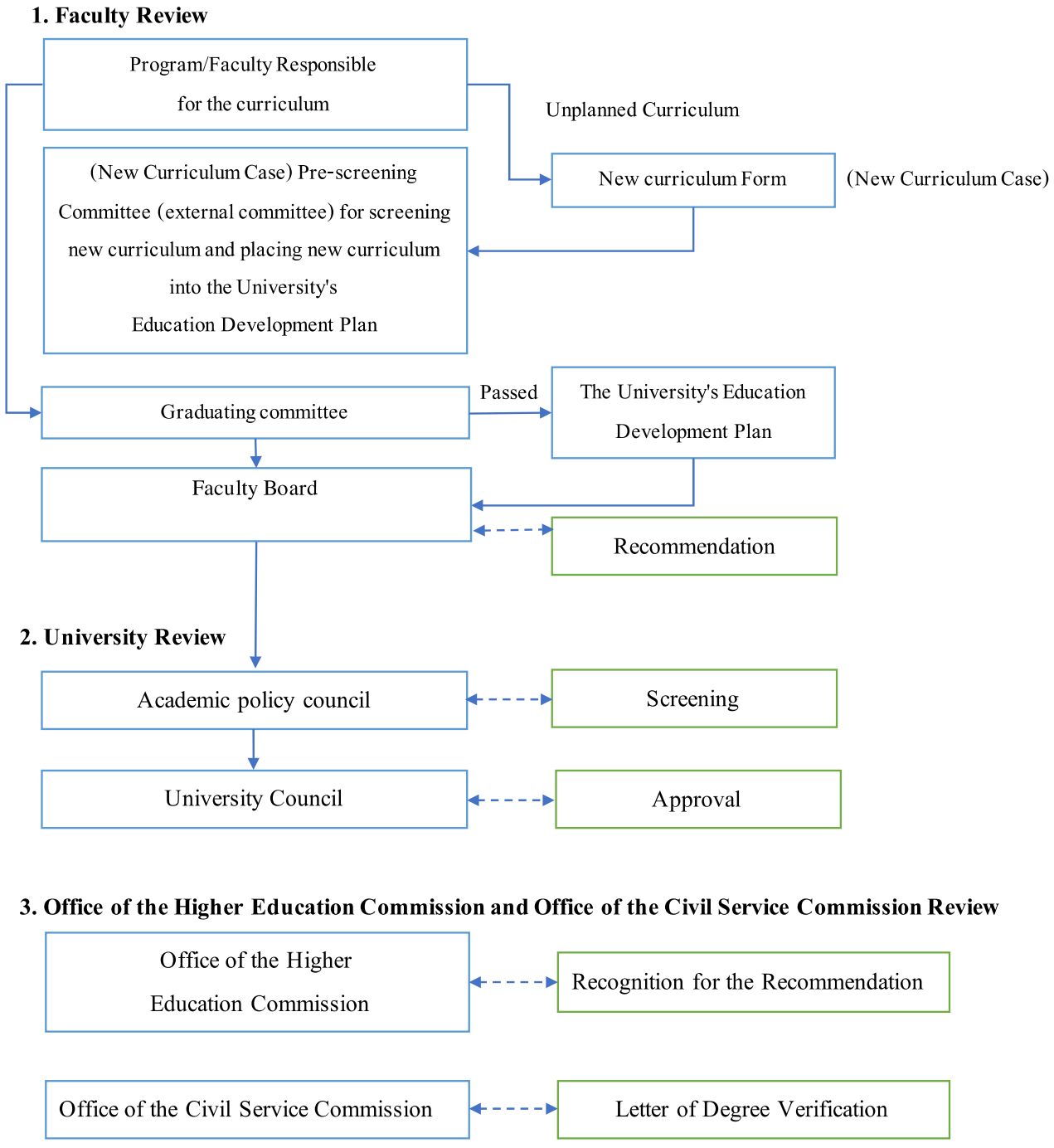

Figure 1 *Process to obtain a curriculum approval of KKU, TU, and KMUTNB*

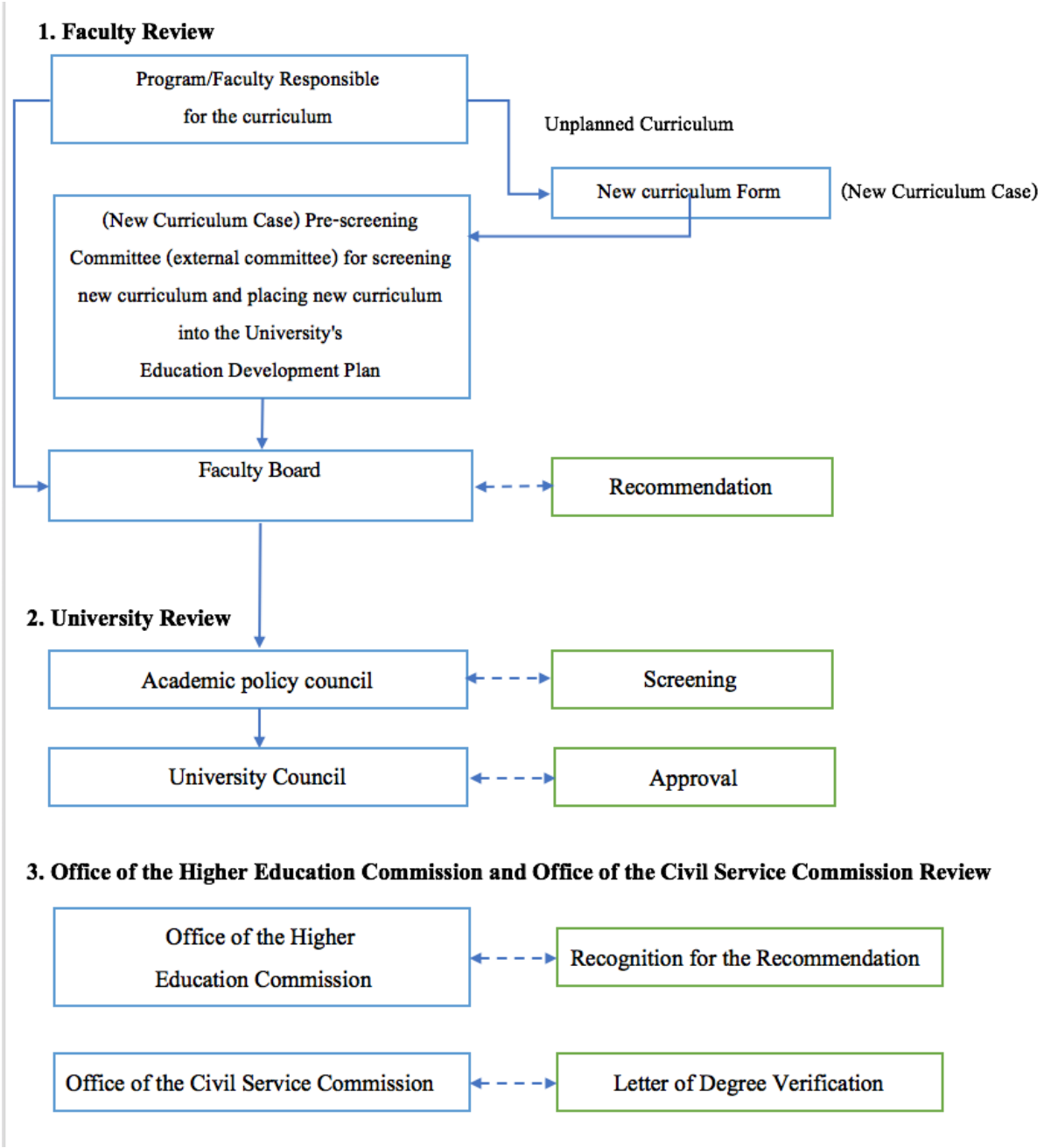

Figure 2 Process to obtain a curriculum approval of PSU

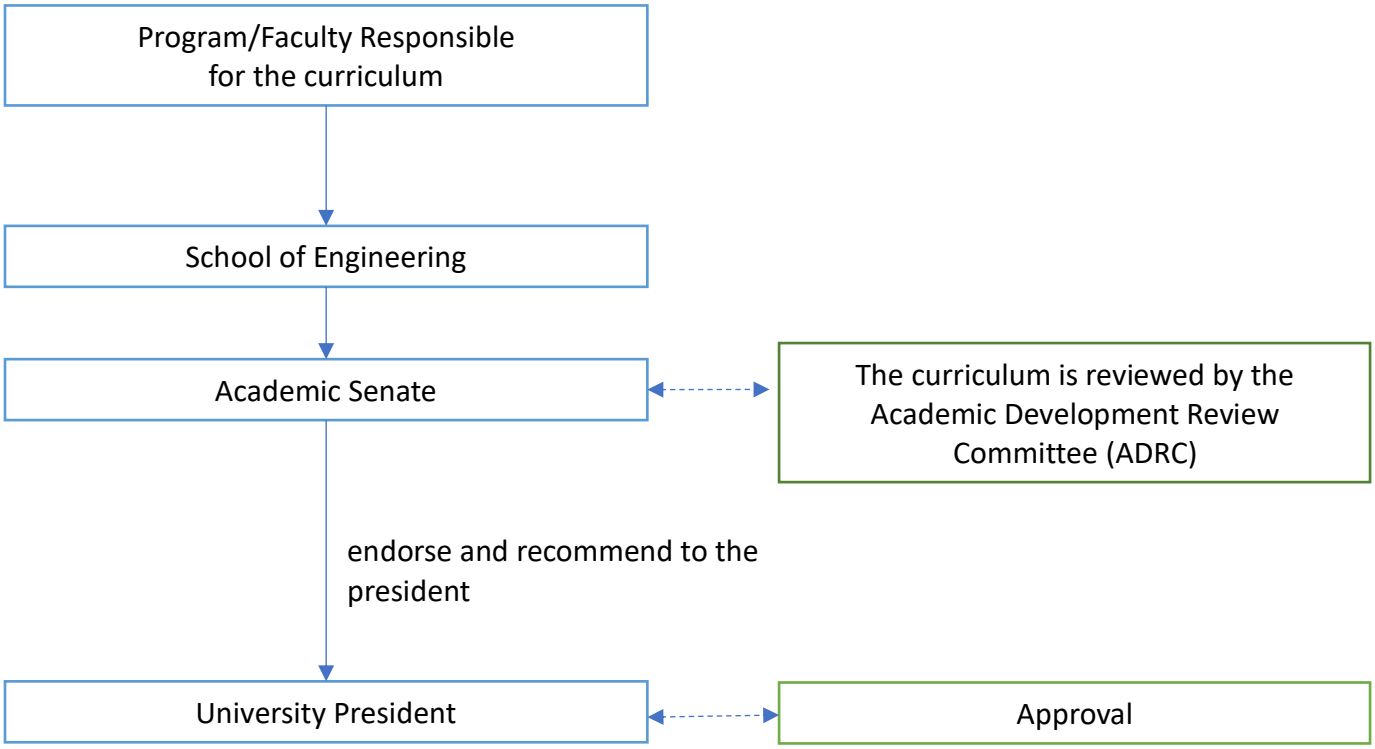

Figure 3 *Process to obtain a curriculum approval of AIT*

Table 1 Timeframe for achieving accreditation of partnering Universities

Activity	Timeframe for getting accreditation					
	PSU	KKU	CMU	TU	KMUTNB	AIT
Propose to Pre-screening committee (External committee)	October 2020	October 2020	November 2020	March 2021	June 2020	-
Propose to Graduating committee	-	October 2020	December 2020	April 2021	June 2020	-
Propose to faculty boards	October 2020	November 2020	-	May 2021	July 2020	-
Propose to university academic committee	November 2020	-	December 2020	June 2021	July 2020	-
Propose to academic policy council	December 2020	January 2021	January 2021	December 2021	August 2020	-
Propose to University council/ or institute academic senate	March 2021	February 2021	February 2021	January 2022	September 2020	January 2021
Due date for admission using the revised curriculum (MSIE4.0)	June 2021	June 2021	June 2021	May 2022	December 2020	August 2021
Get approval from the OHEC	Within 2 years					Must be approved by the institute academic senate

Table 2 Timeframe for achieving accreditation of CUT

Activity	Timeframe for getting accreditation
Propose to Pre-screening committee	November 2020
Propose to faculty boards and External committee	December 2020
Propose to university academic committee	February 2021
Propose to University council/ or institute academic senate	March 2021
Due date for admission using the revised curriculum (MSIE4.0)	October 2021
Approval by Ministry of Science and Education	September 2021

6. Conclusion

In Task 2.5, the preparation for accreditation of the curriculum of each partnering Thai university is reported. To implement the MSIE4.0 curriculum, partnering Thai University must

revise the existing curriculum that is revised every 5 years to achieve the accreditation. Some universities can revise it before the end of the project, while some of them will do it next year. However, steps taken for achieving accreditation for major curriculum revision are similar consisting of 3 main steps which are (1) Faculty review, (2) university review, and (3) the Higher Education Commission (OHEC) and Office of the Civil Service Commission review. Even though steps taken for achieving accreditation for major curriculum revision are similar, each university may have different committees for both faculty and university review levels.

For the progress of the curriculum accreditation, at the end of the project, only KMUTNB had finished a major revision of the existing curricula since June 2020, and the admission implementing the revised curriculum (MSIE4.0) already done since August 2021. Only the "Digital Factory" course was added to the revised curriculum since the MSIE4.0 curriculum has not yet completed at the time. However, KMUTNB will put all of the courses in the MSIE4.0 curriculum to the revised curriculum since the MSIE4.0 curriculum is completed. Additionally, three Thai universities, including Prince of Songkla University (PSU), Khon Kaen University (KKU), and Chiangmai University (CMU) are in the process of revising their existing curriculum. They plan for graduate admission next semester (June 2021). At the end of the project, PSU will be completely reviewed by the faculty board. KKU will be completely reviewed by the Graduating committee, while CMU is in the process of preparing the document to propose to the Pre-screening committee. However, for the other Thai universities including Asian Institute of Technology (AIT) and Thammasat University (TU), they have the plan to implement the MSIE4.0 curriculum as well. AIT will have the new submission plan for approval which is expected to be in January 2021 for August 2021, while TU plan for admission with the revised curriculum (MSIE4.0) in May 2022. CUT, one of European partners, is preparing new Master curriculum on Quality and Production Management that would be based on MSIE4.0 curriculum. Additionally, CUT includes also some courses from MSIE4.0 in curriculum on Design and Project Management. The planned date to finish up with faculty, university and Ministry of Education accreditation is September 2021 for both of the programs. This date is also marking the launch of the programs for students. The similar due date for launching a new program is for UPB, the second of the EU partnering Universities, that has just launched the development process of a master program in Applied Informatics in Industrial Engineering. The program would be partially based on MSIE4.0 curriculum as well.

Despite some delay in accreditation processes among project Partners it is clear that the major outcome of the project, namely MSIE4.0 curriculum, has become building block for developing their educational offer within industrial engineering for the nearest future. It is also evident that the engagement within the project has brought deep insights into its educational approaches and methods and would certainly cause some more impacts concerning the quality of education and its most important outcomes: competences of graduates.