



Rule and Procedure for Accreditation of Engineering Education

(3rd Revision)

Guideline Document for Accreditation of Engineering Educational Program
6-Year Accreditation Cycle
Starting Academic Year 2024



(Translation Document)



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for**

**Accreditation of Engineering Educational Program
6-Year Accreditation Cycle
Starting Academic Year 2024**

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Document Control Table

Revised No.	Revised Items
3	<p>Chapter 1</p> <ul style="list-style-type: none"> - For the 6-Year accreditation cycle starting academic year 2024 <p>Chapter 2 and Chapter 3</p> <ul style="list-style-type: none"> - Correct spelling and change credit requirement from curriculum with credit requirement from 120 to 150 credits to curriculum with credit requirements of not less than 120 credits. - Section 3.4 changing requirement from self-evaluation report in 5 printed copies to self-evaluation report in electronic document. - Section 3.6 adding details of accreditation decision meeting. <p>Chapter 4</p> <ul style="list-style-type: none"> - Section 4.1.1 adding TABEE Committee functions and responsibilities relating to educational qualification recognition of overseas graduates. - Section 4.2 adding EAC and EAC functions and responsibilities. - Adjusting functions and responsibilities of the program evaluating team relating to exit meeting (omitting the suggestion during the exit meeting) <p>Chapter 5</p> <ul style="list-style-type: none"> - Adjusting exit meeting procedure carried out by PEV team leader. - Adjusting program visit schedule. - Adding details of accreditation decision meeting <p>Chapter 6 adjust wordings for concise and better understanding</p> <ul style="list-style-type: none"> - Criterion 1: adding “counseling on student’s wellbeing” and “a procedure for improving student knowledge base in case of necessity” - Criterion 3: revising program outcomes to be in line with WA GAPCs 4 and adding students’ knowledge profiles requirement to support program outcomes assessment. - Program Outcome 1 revising and adding “computing” - Program Outcome 2 adding “with consideration of sustainable development”. - Program Outcome 3 adding sustainable development such as; whole-life cost, net zero carbon - Program Outcome 4 changing “complex engineering problem” to “engineering problem” - Program Outcome 7 adding “effectively communicate in Thai and English languages” - Program Outcome 8 changing heading to “The Engineer and the World” and adjusting wordings relating to sustainable development and adding “economy and legal framework” - Program Outcome 9 adding “national and international laws”, and adding “Demonstrate and understanding of the need for diversity and inclusion.” - Program Outcome 11 adding “independent and lifelong learning, adaptability to new and emerging technologies, and critical thinking in the context of technological change” - Adding knowledge profiles TK1 to TK9 for supporting program outcomes assessment - Criterion 5: adding “knowledge profiles and content appropriately and adequately in quantity and quality”, omit credit requirement for general education

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Revised No.	Revised Items
3	<p>Chapter 7</p> <ul style="list-style-type: none"> - Revising accreditation schedule <p>Chapter 8, 9,10</p> <ul style="list-style-type: none"> - Correction spelling and revising wordings <p>Chapter 14</p> <ul style="list-style-type: none"> - Adjusting qualification of program advisor or advisory panel <p>Attachment 1</p> <ul style="list-style-type: none"> - Adding terms and definition <p>Attachment 2, Attachment 3, Attachment 4</p> <ul style="list-style-type: none"> - Revising wording and report template according to revised R&P Ver3 <p>Attachment 8</p> <ul style="list-style-type: none"> - Adding WA graduate attributes and knowledge profiles for reference

Table of Contents

	Page
1. Introduction	1
2. Definition, Objectives and Scope of Accreditation	1
2.1 Definition	1
2.2 Objectives	1
2.3 Scope of Accreditation	1
3. Accreditation Principles	2
3.1 Accreditation Procedure	2
3.2 Accreditation Cycle	2
3.3 Educational Program Eligible to Accreditation	2
3.4 Application and Preparation Prior to Program Visit	3
3.5 Program Evaluation	4
3.6 Consideration for Accreditation Result	4
3.7 Revision of Accredited Program Curriculum	5
3.8 Appeal Request	5
3.9 Publicizing of Accredited Program	5
3.10 Confidentiality	5
3.11 Accreditation Cost	5
3.12 Conflict of Interest	6
4. Appointments and Functions of Subcommittee, Working Group, Program Evaluating Team, and Coordinating Staff	6
4.1 TABEE Subcommittee	6
4.2 Engineering Program Accreditation Commission (EAC)	7
4.3 Intervenor Working group	7
4.4 Program Evaluating Team	7
4.5 Designated TABEE Subcommittee Member for Coordinating Program Visit and Accreditation Report	10
4.6 Coordinating Staff	10
5. Accreditation Procedure	10
5.1 Document Review	11
5.2 Program Visit	11
5.3 Accreditation Reporting	14
6. Accreditation Criteria	15
6.1 Criterion 1 Students	15
6.2 Criterion 2 Program Educational Objectives	16
6.3 Criterion 3 Program Outcomes	16
6.4 Criterion 4 Continuous Improvement	19
6.5 Criterion 5 Curriculum	19
6.6 Criterion 6 Faculty	20
6.7 Criterion 7 Facilities	20

Table of Contents

	Page
6.8 Criterion 8 Institutional Support	20
7. Schedule	21
8. Program Curriculum Eligible to Accreditation	22
9. Application, Documentation, and Preparation Prior to Program Visit	23
10. Accreditation Administration	24
11. Accreditation Result and Reporting	24
12. Appeal	27
13. Publicity of Accredited Program	27
14. Assistance to Educational Institution	27
15. List of Accreditation Documents	28
16. Attachment	28
Attachment 1 Terms and Definitions	29
Attachment 2 Template for Program Self-Evaluation Report	36
Attachment 3 Checklist for Program Evaluation	65
Attachment 4 Template for Accreditation Report	83
Attachment 5 Description of Knowledge Contents for Basic Engineering and Specific Engineering	101
Attachment 6 Council of Engineers Regulations for Recognition of Degree, Certificate or Diploma Pertaining to the Regulated Engineering Practices (2 nd Amendment) 2018	117
Attachment 7 Council of Engineers Rule on Accreditation of Engineering Education 2017	122
Attachment 8 Washington Accord Graduate Attributes and Knowledge Profiles	125

1. Introduction

This Rule and Procedure for Accreditation of Engineering Education (3rd revision) shall be used as a reference document for accreditation of engineering education program that offers a bachelor degree of engineering within the Kingdom of Thailand for the 6-year accreditation cycle starting academic year 2024. This document is prepared and approved by The Council of Engineers Thailand (COET) according to The Council of Engineers Rule for Accreditation of Engineering Education (2017).

2. Definitions, Objectives and Scope of Accreditation

2.1 Definitions

For organizations and personnel involving in accreditation of engineering education to have thoroughly understanding of related roles, functions, principles procedures, and operational framework of the accreditation of engineering educational program, the Thailand Accreditation Board of Engineering Education (TABEE), therefore, provides the explanation of definitions and terms relating to the accreditation as they are prescribed in **Attachment 1 Terms and Definitions**.

2.2 Objectives

The Thailand Accreditation Board for Engineering Education (TABEE), the Council of Engineers Thailand (COET), sets up the objectives of accreditation of engineering educational program as followings;

1. To evaluate program outcomes and quality of engineering education program management as prescribed by TABEE of the Council of Engineers Thailand and corresponding to recognized international educational accord.
2. To promote educational institution for providing quality education and continuous quality improvement to program students.
3. To publicize, to inform and to ensure society, students and individuals that engineering graduate from the accredited program has adequately attained program outcomes according to required graduate attributes for engineering profession and corresponding to recognized international educational accords.

2.3 Scope of Accreditation

The accreditation of engineering educational program prescribed within this document is used for recognition of engineering educational program at the bachelor degree level with equivalent to 4 years education period and graduation requirements of not less than 120 credits in semester system.

3. Accreditation Principles

Accreditation of engineering education is an evaluation process on management of educational program that the Council of Engineers Thailand (COET) offers to educational Institutions in Thailand on a requisition for accreditation of the engineering educational program.

The educational institution should voluntarily follow on rules and procedures prescribed within this document and additional operating guidelines relating to the accreditation of engineering education of the COET.

3.1 Accreditation Procedure

Accreditation procedure, that is operated by TABEE of COET, is considered as an evaluation process on educational program outcomes and effectiveness of program management that is administrated by educational institution to confirm that graduate of the engineering program has adequately attained graduate attributes required in engineering professional practice.

3.2 Accreditation Cycle

Accreditation cycle is limited to 6 academic years starting from the COET approved academic year.

3.3 Program Curriculum Eligible to Accreditation

Program curriculum eligible to TABEE accreditation is characterized as follow.

3.3.1 Full-time Curriculum

Full-time program curriculum at bachelor degree level equivalent to 4 academic years education that has been approved by the university board for 4 years educational program with credit requirement of not less than 120 credits in semester system specified by The Commission on Higher Education Standards (CHES) or other relevant regulating authority for quality of higher education.

The program must have curriculum structure that provides adequate student's knowledge profiles throughout the teaching and learning and application of knowledge contents on basic sciences and mathematics, basic engineering, and specific engineering to solve and design on complex engineering problems, adequately for engineering professional practice according to accreditation criteria described in the document.

3.3.2 New Curriculum

Full time program curriculum at bachelor degree level equivalent to 4 academic years education that does not yet have program graduate and has been approved by the university board for 4 years educational program with credit requirement not less than 120 credits in semester system specified by The Commission on Higher Education Standards (CHES) or other relevant regulating authority for quality of higher education.

The program must have curriculum structure that provides adequate student's knowledge profiles throughout the teaching and learning and application of knowledge contents on basic sciences and mathematics, basic engineering, and specific engineering to solve and design on complex engineering problems, adequately for engineering professional practice according to accreditation criteria described in the document.

3.3.3 Multi-Disciplinary Curriculum

In case that the full-time engineering program curriculum is multi-disciplinary program or combined engineering fields curriculum, TABEE shall accredit for only a major field of engineering.

3.3.4 Curriculum with Optional Courses

In case that the full-time engineering curriculum provides optional courses or tracks for students to select for graduation, resulting different graduate attributes according to each option or track with different constituencies requirements. The educational institution applying for program accreditation shall provide document and evident support for every option or track. In case that the engineering program partially offers teaching and learning in some specific option of the curriculum, TABEE shall accredit only to the specific options that are presented in program self-evaluation report and support document provided by the educational program.

3.3.5 Curriculum with Several Campus Sites

In case that the full-time engineering curriculum provides teaching and learning at different teaching campus sites, and/or different educational environments, and/or with different faculties and institutional support, TABEE should evaluate program outcomes specifically for each program in each faculty and in each campus site.

3.3.6 Curriculum under Cooperation between Educational institutions Domestically and with International Institutions

TABEE has not yet established accreditation procedure for the program operating under cooperation between educational institutions that offers teaching and learning in different campus system and TABEE shall consider accepting accreditation and accreditation procedure for each specific case.

3.4 Application and Preparation Prior to Program Visit

Educational institution applying for program accreditation should submit program self-evaluation report and supporting documents printed in electronic document format to COET Website: <https://service.coe.or.th/instituteAuthen/institutelogin> according to accreditation schedule described within this document or according to COET announcement on changing of the schedule.

In case that the program self-evaluation report does not follow report template, insufficient quality, or lack of contents and support documents as they are described in this document, TABEE shall notify rejection of accreditation application to the educational institution and the educational

institution should re-submit application for program accreditation with revised program self-evaluation report for the next academic year.

The educational institution should submit additional support documents requested by COET in time according to the schedule. In case of inappropriately delay submission of document, the program evaluating team may consider postponing or cancelling the program visit accordingly.

In case that educational institution prefers to submit program self-evaluation report in English version, shall submit a request official letter to TABEE Committee for consideration.

3.5 Program Evaluation

Program evaluation shall be carried out by a team of program evaluator, appointed by COET under nomination of TABEE, to evaluate program outcomes and effectiveness of program quality management according to accreditation criteria prescribed within this document.

A program evaluating team shall consist of 3 evaluators selected from academia and professional practitioners relating to the specific engineering of the program. One designated program evaluator of the team shall be appointed to review program interim report for program monitoring during the accreditation cycle.

3.6 Consideration for Accreditation Result

Program evaluating team and a designated TABEE subcommittee member for coordinating the program visit set up meeting for consideration of program accreditation result and accreditation reporting according to the report template. The accreditation report is then further reviewed by an intervenor working group for reducing of any courses that may lead to conflict of interest.

The program evaluating team leader shall present the reviewed accreditation report during the TABEE Decision Meeting. The meeting should consist of TABEE's Engineering Program Accreditation Commission (EAC), other program evaluating team leaders (This Decision Meeting may be arranged by program discipline or by educational institution, whichever is appropriate.), and the intervenor working group. The Decision Meeting shall start with intervenor group's presentation and report with opinion which may or may not be aligned with the program evaluating team's suggestion for accreditation decision. The meeting then discusses on intervenor's report and the program evaluating team suggestion for accreditation decision until the program accreditation decision has reached an appropriate satisfaction. The secret ballot for program accreditation decision is consequentially arranged. The accreditation decision arranged by the decision meeting is considered concluded. The list of accreditation results which are approved during the decision meeting shall be consequently an agenda seeking for approval during the TABEE meeting and later is sent to COET board meeting for endorsement and later informing the educational program for accreditation result.

The program evaluating team may consider program accreditation results as follows.

1. Full accreditation for accreditation cycle of 6 years.
2. Accreditation with requirements for a period not exceeding 3 years. Review report on program improvement is required for program monitoring.
3. Provisional accreditation (For the new program curriculum which does not have program graduate.) The provisional accredited program must submit program self- evaluation report after completing 2 classes of program graduation.)
4. Defer accreditation.
5. Decline accreditation or revoke accreditation.

Detailed description of accreditation result and conditions is tabulated in accreditation result table demonstrated in Chapter 11 Accreditation Result and Reporting.

3.7 Revision of Accredited Program Curriculum

In case of minor revision of program curriculum and no change in program educational objectives and program graduate attributes, the educational institution should notify TABEE of such revision of program curriculum and remain program accreditation result until completion of accreditation cycle.

In case of revision of program educational objectives and changes in program outcomes or graduate attributes, the educational institution should re-apply for program accreditation within the starting year of that program curriculum.

3.8 Appeal Request

In case of decline accreditation or revoke accreditation, the educational institution may wish to file appeal request for revision of accreditation result, Chapter 12 Appeals describes step procedure for appeal of accreditation result.

3.9 Publicizing of Accredited Program

TABEE secretariat is responsible for updating registration of accredited engineering program and publicize list of accredited programs on COET website at www.coe.or.th

3.10 Confidentiality

TABEE subcommittee, intervenor working group, and TABEE secretariat shall consider document and reports used for program evaluation and program accreditation as confidential matter and shall not disclose or publicize such documents without written permission from educational institution or from appropriate owner.

3.11 Accreditation Cost

Educational institution is responsible for cost and expenditures of preparation of program self-evaluation report and support documents, accreditation requisition fee, and program visit fee according to announcement of COET upon reception of acceptance letter for application of program accreditation.

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During preliminary document review, program visit, and accreditation reporting, COET shall bear all expenses and costs taken place upon program evaluators and TABEE coordinating staff and other team members.

3.12 Conflict of Interest

TABEE subcommittee, working groups, program evaluating teams, and accreditation secretariat and coordinating staff shall consider prevention all courses that may lead to conflict of interest among constituencies, occurring during accreditation activities.

4. Appointments and Functions of TABEE Subcommittee, Working Group, Program Evaluating Team, and Coordinating Staff

4.1 TABEE Subcommittee

COET Board appoints TABEE subcommittee to operate on accreditation of engineering program accordingly to the Council of Engineers Rule on Accreditation of Engineering Education (2017).

4.1.1 Functions and Responsibilities of TABEE Subcommittee

- 1) To accredit engineering program domestically according to criteria and guides prescribed by the Council of Engineers Thailand.
- 2) To administrate and develop work systems for accreditation of engineering education to attain the international recognition of quality engineering education and engineering profession.
- 3) To propose amendment of rules and regulations relating to the accreditation of engineering education.
- 4) To prepare operational plan and budget for development of work system relating to the accreditation of engineering education.
- 5) To train human resources and program evaluators for the accreditation of engineering education.
- 6) To publicize, to coordinate and experiences transfer of international activities relating to accreditation of engineering education to educational institution, professional practitioner, and corresponding constituencies.
- 7) To prepare documents for recognition of accreditation system according to international accord on accreditation of engineering education.
- 8) To publicize list of engineering education program which are accredited by the Council of Engineers
- 9) To give recommendation for educational quality improvement to educational institution in accordance with graduate attributes for engineering profession.
- 10) To propose Board of the Council of Engineers Thailand the appointment of working group as it is necessary to assist the work of accreditation.
- 11) To operational report to the Board of the Council of Engineers Thailand.
- 12) To operate on other COET assigned functions.

4.2 Engineering Program Accreditation Commission (EAC)

TABEE subcommittee nominates EAC to COET board for appointment.

4.2.1 Functions and Responsibilities of EAC

- 1) To improve accreditation system and documents accordingly to Washington Accord requirements.
- 2) To supervise the program accreditation accordingly to Washington Accord requirements and the accreditation procedures and conditions, which are published in TABEE's Rules and Procedures for accreditation cycle and the academic year announced by COET.
- 3) To arrange the accreditation decision meeting.
- 4) To propose result of accreditation decision meeting for TABEE's approval.
- 5) To operate on other matters upon TABEE's request.

4.3 Intervenor Working Group

TABEE subcommittee nominates Intervenor working group to COET board for appointment.

4.3.1 Functions and Responsibilities of Intervenor Working Group

- 1) Initial reviews on program self-evaluation report and support documents for quality and contents conforming to self-evaluation report template and reports to TABEE subcommittee for consideration acceptance of the program accreditation application.
- 2) Reviews accreditation reports which are prepared by program evaluating teams for the conformity and prevention all courses that may lead to conflict of interest.
- 3) Attends Decision Meeting

4.4 Program Evaluating Team

The 3- program evaluating team, appointed by TABEE of The Council of Engineers Thailand, shall consist of a team chair and 2 program evaluators. The program evaluating team should consist of an academia, professional practitioner relating to the specific engineering of the program to be accredited.

The evaluator team shall be coordinated by TABEE secretariat for the related accreditation activities, appointment for program visit, and additional request for documents from educational institution.

During the program visit, with permission from the educational institution, there may be Observer(s) attaching to the evaluator team.

4.4.1 Functions and Responsibilities of Program Evaluating Team

1. **Preliminary Document Review.** During preliminary review of program self-evaluation report, the program evaluating team may acquire for some clarifications and request

for additional documents from educational institution. In case that the educational institution is not able to provide the appropriate document as requested or delay submission of the requested document in time, the evaluator team may consider postponing or cancelling the program visit.

2. Program Visit. Program evaluating team and TABEE coordinating staff make appointment for program visit according to notified accreditation schedule. Step procedures for program visit are listed as following.

- 1) Reviewing teaching and learning course portfolio relating to basic engineering and specific engineering subjects that are taught by the program teaching staff for the knowledge content, homework, assignment, term report that are given to students during classes, and the class evaluation.
- 2) Meeting with Dean, program chair, program executives about schedule and activities of the program visit and listening to presentation about overview of the educational institution and program administration evaluators may ask for clarifying issues on program self-evaluation report and program quality management in accordance with the prescribed TABEE program outcomes.
- 3) Evaluating class teaching and learning, laboratory equipment, laboratory facilities, library, information technology support system, and academic environment as prescribed in TABEE accreditation criteria.
- 4) Interviewing program chair, teaching staff, laboratory staff and supporting staff for evaluation of program quality management, program teaching and learning responding to program objectives, program outcomes, and program graduate attributes for professional practice which are prescribed in the curriculum.
- 5) Interviewing program students (from all classes) to ensure program outcomes and program graduate attributes for professional practices. The program evaluating team should specify the number and academic condition of students required for the interview.
- 6) Interviewing program graduates to ensure program graduate attributes for professional practices, the number and condition of which are to be specified by the program evaluating team.
- 7) Interviewing program alumni who currently practice engineering profession in the industry to ensure program graduate attributes required for professional practices, the number and condition of which are to be specified by the program evaluating team.

3. Exit Meeting. During exit meeting, program evaluating team must wrap up program visit and inform to institutional executive, program chair and program executives as followings.

- 1) Steps towards accreditation reporting.
- 2) List of factual findings during the program visit detailed explanations or suggestions are not necessary provided.

4. Accreditation Reporting. Program evaluating team shall prepare accreditation report as followings.

- 1) Program evaluating team arranges meeting and conclude the fact-finding report which represent the factual finding during the program visit. This fact-finding report shall be sent to the educational program for acknowledgement or else rebutting.
- 2) Program evaluating team arranges meeting to conclude the program evaluation according to program evaluation checklist and complete the accreditation report using accreditation report template.
- 3) Program evaluating team leader (Evaluator team members may participate the meeting.) carries out meeting with intervenor working group for accreditation report review and editing for prevention of courses that may lead to conflict of interest or appeals.
- 4) Program evaluating team leader (evaluator team members may participate in the meeting.) shall present accreditation report and suggestions in the TABEE Decision Meeting.

4.4.2 Program Evaluator Qualifications

A program evaluator, who is appointed by COET, has following qualifications.

- 1) Complete at least a bachelor degree of engineering in related field of engineering program to be accredited, and
- 2) Pass TABEE program evaluator training course, and
- 3) Has a good attitude towards engineering education and outcomes-based accreditation of engineering education, and
- 4) In case of academia, he/she should have experiences in teaching and research in an institutional education which emphasis on outcome-based education, or
- 5) In case of professional practitioner, he/she should have experiences or participation in professional practice of related field of engineering program to be accredited, or
- 6) Be a member of professional society relating to the field of engineering program to be accredited.

4.4.3 Program Evaluating Team Leader

Program evaluating team Leader, who is appointed by COET, coordinates with TABEE secretariat to set up meeting with other members of program evaluating team as prescribed in Section 4.4.1 Functions and Responsibilities of Program evaluating team. The program evaluating team leader has functions and responsibilities as follows.

- 1) Advise team members and coordinating with TABEE secretariat about rule and procedure of accreditation of engineering education as prescribed in this document.
- 2) Lead program evaluator meeting to complete accreditation report according to prescribed program evaluation checklist and accreditation report template.

- 3) Carry out meeting with intervenor working group to review accreditation report for the conformity and prevention all courses that may lead to conflict of interest.
- 4) Present accreditation report and suggestion in the TABEE Decision Meeting.

The program evaluating team leader must have professional experiences, or have/had been an executive of accredited program or used to be TABEE program evaluator or passed TABEE program evaluator training course. The team leader must be capable to advise on rule and procedure of accreditation engineering education.

4.5 Designated TABEE Subcommittee Member for Coordinating Program Visit and Accreditation Report

In case of an educational institution with multiple-program visits on the very same campus site, TABEE shall assign a designated TABEE subcommittee member for coordinating the program visit and accreditation reporting for that specific campus site.

The designated TABEE subcommittee member shall coordinate among program evaluating teams for program visit and preparation of accreditation reports for the conformity of the accreditation reports.

4.6 Coordinating Staff

TABEE secretariat shall be assigned to coordinate among TABEE subcommittee, program evaluating teams, and educational institution on administrative work, appointment, documentation, and data archive to facilitate the program accreditation to attain transparency and the set forth accreditation schedule.

5. Accreditation Procedure

The accreditation of educational program is an evaluation process that the Thailand Accreditation Board for Engineering Education (TABEE), the Council of Engineers Thailand, provides to educational institution. This evaluation is for recognition of program outcomes and effective quality management of the program as they are described in program self-evaluation report, submitted together with requisition letter for accreditation of educational program within accreditation schedule of this document or within timeframe specified in an announcement for accreditation schedule.

Upon reception of requisition letter and program self-evaluation report, TABEE intervenor working group shall Initially review the program self-evaluation report and support documents for quality and contents conforming to self-evaluation report template and reports to TABEE subcommittee for consideration acceptance of the program accreditation application.

TABEE thus nominates designated TABEE subcommittee members for coordinating program visit and accreditation report (in case of multiple-program visits), program evaluating teams and observers on program visit for COET appointment on evaluation of program outcomes and quality management of the program. The evaluation team, then, shall review program

self-evaluation report and document support relating program quality management in accordance with accreditation criteria.

The program accreditation consists of 3 work processes;

- 1) Document review
- 2) Program visit
- 3) Accreditation reporting

The program evaluating team shall review the program self- evaluation report and supporting documents using program evaluation checklist provided by TABEE, then arranges the program visit to confirm program outcomes, additional clarifications, and inform program executives about factual findings in the exit meeting.

Program evaluating team later arranges team meeting for preparation of accreditation report according to report template, discusses with intervenor working group for report review, and presents the accreditation report with suggestion in TABEE Decision Meeting. The EAC's approved list of accreditation result is further processed for TABEE approval.

5.1 Document Review

During the review, evaluator team may need some clarifications and request for additional explanation and supporting documents from educational institution. In case of requesting for additional clarifications and supporting documents, the educational program is not able to appropriately submit the requested documents in proper due time. The program evaluating team may consider postponing or cancelling the program visit.

In case that the educational institution has properly clarified and has submitted requested document, the evaluator team shall notify TABEE coordinating staff for later appointment for program visit.

Or else, in case that the above- mentioned documents are not substantial to program evaluation, the evaluator team may request the educational institution to prepare and present to the evaluator team during the program visit.

In case that the evaluation team, after the document review, considers that the program outcomes and program management do not comply with the criteria set forth by TABEE and insufficiently attains the program quality below prescribed accreditation criteria. The evaluation team may consider decline accreditation or revoke accreditation without further making appointment for program visit.

5.2 Program Visit

The program visit is a 2- day visit according to the prepared schedule and notifying letter for program visit, in case of program monitoring, program evaluator may consider only report

review on progressive report or arrange 1-day program visit as it is appropriately needed. The evaluation team should perform as follows,

- 1) Reviewing teaching and learning course portfolio relating to basic engineering and specific engineering subjects that are taught by the program teaching staff for the knowledge content, homework, assignment, term report that are given to students during classes, and the class evaluation.
- 2) Meeting with Dean, program chair, program executives about schedule and activities of the program visit and listening to presentation about overview of the educational institution and program administration. Evaluators may ask for clarification relating to program self-evaluation report and program quality management.
- 3) Evaluating class teaching and learning, laboratory equipment, laboratory facilities, library, information technology support system, and academic environment as prescribed in TABEE accreditation criteria.
- 4) Individually interviewing program chair, teaching staff, laboratory staff and supporting staff for evaluation of program quality management, program teaching and learning to attain program objectives, program outcomes, and program graduate attributes for engineering professional practice.
- 5) Interviewing program students (from all classes) to ensure program outcomes and program graduate attributes for engineering professional practices. The program evaluating team should specify the number and academic condition of students required for the interview.
- 6) Interviewing program graduates to confirm program graduate attributes for engineering professional practices, the number and condition of which are to be specified by the program evaluating team.
- 7) Interviewing program alumni who currently practice engineering profession in the industry to confirm program graduate attributes required for professional practices, the number and condition of which are to be specified by the program evaluating team.
- 8) During exit meeting, program evaluating team must wrap up program visit and inform to institutional executive, program chair and program executives as followings.
 - 1) Steps towards accreditation reporting.
 - 2) List of factual findings during the program visit. Detailed explanations or suggestions are not necessary provided.

In case of multiple- program visit on the same campus site, TABEE shall assign a designated TABEE subcommittee member to lead the program visit and meet with institutional executives for visiting schedule and activities. The appointment of multiple- program visit should not be more than 5 programs each time.

An exemplar of program visit here below is tentatively scheduled and is given to the educational program for visiting preparation as following;

Day 0 (Prior to program visit)

Time	Activities
18.00 - 21.00 hr.	Program evaluating teams and TABEE designated subcommittee member have dinner together; review visiting schedule and identify clarification issues needed during the program visit.

Day 1 (Program visit)

Time	Activities
9.00 - 9.45 hr.	Program evaluating teams meet with Dean, program chair, program executives about schedule and activities of the program visit and listening to presentation about overview of the educational institution administration and development plan.
9.45 - 10.15 hr.	Each program evaluating team meets with program chair, program executives for presentation on program administration and self-evaluation report.
10.15 - 10.30 hr.	Each program evaluating team reviews on issues needed for clarification relating to self-evaluation report.
10.30 - 12.00 hr.	Each program evaluating team assesses classroom teaching and learning, laboratory equipment, laboratory facilities, library, information technology support system.
12.00 - 13.00 hr.	Lunch break.
13.00 - 13.15 hr.	Each program evaluating team reviews on issues and draft list of questions for institution and program.
13.15 - 14.45 hr.	Each program evaluating team reviews on course portfolio and support documents.
14.45 - 15.15 hr.	Each program evaluating team Interviews alumni and constituencies from industries.
15.15 - 15.45 hr.	Each program evaluating team Interviews program graduates.
15.45 - 17.00 hr.	Program evaluators individually Interviews program students.
17.00 - 18.00 hr.	Back to Hotel.
18.00 - 21.00 hr.	Each program evaluating team arranges team meeting; exchanging/summary on factual findings, drafting exit meeting statement.

Day 2 (Program visit)

Time	Activities
9.00 - 10.00 hr.	All program evaluating teams and designated TABEE subcommittee meet with institutional executive, program chair, program executives.
10.00 - 11.00 hr.	Program evaluators separately interview program faculty staff, question on program, course outcomes improvement and curriculum review.
11.00 - 12.00 hr.	Program evaluators separately Interview program staff, teaching assistance and/or laboratory staff.
12.00 - 13.00 hr.	Lunch break

Time	Activities
13.00 - 13.40 hr.	Program evaluators review course portfolio and SER supporting documents
13.40 - 14.00 hr	Each program evaluating team interviews program chair/ program executives and finalize on clarification issues with program chair/program executives
14.00 - 15.30 hr.	Visiting teams and designated TABEE subcommittee arrange meeting to conclude on exit meeting and exit statement.
15.30 - 16.00 hr.	- Visiting teams and designated TABEE subcommittee arrange exit meeting with institutional executives, program chair, program executives. - Designated TABEE subcommittee member or evaluator team leader(s) reads exit statement.

In case of program monitoring or program re-evaluation, an exemplar of 1-day program visit here below is given to the educational program for visiting preparation as following;

Time	Activities
9.00 - 9.30 hr.	Program evaluating team or a designate evaluator arranges meeting with program chair/ program executives about visiting objectives, mission, schedule, and activities.
9.30 - 10.00 hr.	Program evaluating team or a designate program evaluator listens to presentation on program progressive report and improvements. Question/answer session.
10.00 - 12.00 hr.	Program evaluating team or a designated program evaluator or reviewer examines course portfolio and documents, and/or visit laboratory equipment, laboratory facilities, library, information technology support system, or other educational facilities, that is required for improvement.
12.00 - 13.00 hr.	Lunch break.
13.00 - 14.00 hr.	Visiting team arranges meeting to conclude on exit meeting and exit statement.
14.00 - 14.30 hr.	Designated TABEE subcommittee or program evaluating team leader or designated program evaluator arranges exit meeting with program chair, program executives.

5.3 Accreditation Reporting

Program evaluating teams meet with designated TABEE subcommittee member for coordinating program visit and accreditation report to conclude factual findings, weakness, concern, observation, and suggestion for improvement and prepare accreditation report according to prescribed report template.

Program evaluating team leaders and designated TABEE subcommittee member accreditation report meets with intervenor working group to review accreditation report for the conformity and prevention all courses that may lead to conflict of interest and appeal issues. It is not necessary that the result of discussion is conclusive. The intervenor working group and program evaluating team may possibly stand on different opinions.

The program evaluating team leader shall present the reviewed accreditation report during the TABEE Decision Meeting. The meeting should consist of TABEE's Engineering Program Accreditation Commission (EAC), other program evaluating team leaders (This Decision Meeting

Rule and Procedure for Accreditation of Engineering Education (3rd Revision)
Document Number: 01/2023
Revision Dated: 2 Nov 2023

may be arranged by program discipline or by educational institution, whichever is appropriate.), and intervenor working group. Decision Meeting shall start with intervenor group's presentation and follow by program evaluating team's accreditation report. The presentation by intervenor working group may not be aligned with the program evaluating team's suggestion for accreditation decision. The meeting then discusses on intervenor's report and program evaluating team suggestion for accreditation decision until the program accreditation decision has reached an appropriate satisfaction. Secret ballot for program accreditation decision is consequentially arranged for voting. The accreditation decision arranged by the decision meeting is considered concluded. The list of accreditation results which are approved during the decision meeting shall be consequently an agenda seeking for approval during the TABEE meeting and later is sent to COET board meeting for endorsement and later informing the educational program for accreditation result.

The program evaluating team may consider program accreditation result as follows.

- 1) Full accreditation for accreditation cycle of 6 years.
- 2) Accreditation with requirements for a period not exceeding 3 years. Review report on program improvement is required for program monitoring.
- 3) Provisional accreditation (For the new program curriculum which does not have program graduate.). The provisional accredited program must submit program self- evaluation report after completing 2 classes of program graduation.)
- 4) Defer accreditation.
- 5) Decline accreditation or revoke accreditation.

Detail description of accreditation result and conditions are written in format of accreditation result in Chapter 11 Accreditation Result and Reporting.

6. Accreditation Criteria for Academic Year 2019-2024

These accreditation criterions are based on evaluation of program outcomes requires that an educational institution acquiring for accreditation of engineering education to submit supporting evidence, document and report, to TABEE for consideration recognition of quality education management and attainment of quality educational component in accordance with TABEE criteria. The accreditation criteria shall be described as following;

6.1 Criterion 1 Students

Quality and professional competence of program graduates are essential components of program outcomes evaluation.

An educational institution seeking for accreditation is required to have process for assessment of student learning outcomes with adequate student advisory on activities towards his/her profession career development, as well as counseling on student's wellbeing. The program must have formative and summative assessments and program monitoring throughout the education period to ensure that the program students have attained both quality and attributes set forth in the curriculum objectives.

*Rule and Procedure for Accreditation of Engineering Education (3rd Revision)
Document Number: 01/2023
Revision Dated: 2 Nov 2023*

Since quality and readiness of students entry to program are essential components leading to attainment of program outcomes, an educational institution seeking for accreditation must have program control procedures and admission statement for selecting student enrollment or admission of student to the program, a procedure for improving student knowledge base in case of necessity, the transfer of educational credits from other institutes to the program, and work procedures for program teaching and learning to ensure that the students are able to graduate from the program with the quality and attributes as prescribed by the program.

6.2 Criterion 2 Program Educational Objectives

An educational program seeking for accreditation of engineering education must have a program statement describing the program objectives, of which indicates that graduate of the program should attain expected program outcomes for engineering professional practice in the program discipline.

An educational program seeking for accreditation of engineering program must have the following components;

- 1) **Curriculum objectives** that have been published and distributed. The curriculum objectives and contents must be corresponding to institutional mission and complying with TABEE criteria.
- 2) **Process to establish the curriculum objectives** which are corresponding to result of assessment and periodical review of the curriculum. The curriculum objectives set forth by the program should serve societal demand for engineering profession career development from all constituents beneficiary of program outcomes.
- 3) **Curriculum, program teaching and learning, and program management** that serve to achieve the set forth curriculum objectives and the program outcomes.
- 4) **Program outcomes assessment and evaluation process** that have been used for reviewing and improvement of curriculum for program students to benefit from quality education.

6.3 Criterion 3 Program Outcomes

This program outcomes used as accreditation criteria is a statement indicating that the program graduates are expected to attain knowledge profile, professional skills and behavioral attributes as they are required in engineering field of professional practice.

The educational institution must submit evidence to TABEE; showing alignment between curriculum objectives and program outcomes.

Program outcomes as they are indicated by attributes of program graduates are as following;

1. Knowledge of Mathematics, Science and Engineering

Ability to apply knowledge of mathematics, natural science, computing, engineering fundamentals and a specific engineering to conceptualize the engineering models, definitions, and/or to respectively apply methodologies, processes, and/or engineering systems in the work place. (according to knowledge profiles TK1 to TK4)

2. Engineering Problems Analysis

Ability to identify, formulate, research literature review, solve, and analyze complex engineering problems reaching substantiated conclusions using principles of mathematics, natural sciences and engineering sciences with holistic considerations for sustainable development. (according to knowledge profiles TK1 to TK4)

3. Design and Development Solutions for Complex Engineering

Ability to design and find solutions for complex engineering problems and design systems, components or processes that meet identified needs with appropriate consideration for society, cultural, public health and safety, professional code of practices, and sustainable development; such as, whole-life cost, net zero carbon, as well as environmental considerations. (according to knowledge profiles TK5)

4. Investigation

Ability to conduct investigations, diagnosis, and evaluation of engineering problems using research- based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions. (according to knowledge profiles TK8)

5. Modern Tool Usage

Ability to create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering problems, with an understanding of the limitations. (according to knowledge profiles TK2 and TK6)

6. Individual and Team Work

Function effectively as an individual, and as a member or leader in diverse and inclusive teams, and in multi-disciplinary, as well as in various settings. (according to knowledge profiles TK9)

7. Communication

Communicate effectively and inclusively in Thai and English languages with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

8. The Engineer and The World

Understand and responsible for engineering professional practice to society, economy, environmental contexts, sustainable development, and legal framework including capability to evaluate the impact of professional engineering work in the solution of complex engineering problems to: society, environment, and sustainable development. (according to knowledge profiles TK1, TK5 and TK7)

9. Ethics

Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice and adhere to relevant to national and international laws. Demonstrate and understanding of the need for diversity and inclusion. (according to knowledge profiles TK9)

10. Project Management and Finance

Demonstrate knowledge and understanding of the principles of economic, and engineering management under consideration of risk and uncertainties.

11. Lifelong Learning

Recognize the need for, and have the preparation and ability to engage in; independent and lifelong learning, adaptability to new and emerging technologies, and critical thinking in the context of technological change. (according to knowledge profiles TK8)

The above-mentioned 11 program outcomes are in line with Washington Accord Graduate Attributes and Knowledge Profiles (2021) (Attachment 8)

Knowledge profiles supporting program outcomes

An educational program should provide curriculum through course teaching and learning for students to have knowledge profiles adequately supporting the assessment of program outcomes as described in table below.

No.	Knowledge Profiles
TK1	A systematic, theory-based understanding of the natural sciences applicable to the discipline and awareness of relevant social sciences.
TK2	Conceptually-based mathematics, numerical analysis, data analysis, statistics and formal aspects of computer and information science to support detailed analysis and modelling applicable to the discipline.
TK3	A systematic, theory-based formulation of engineering fundamentals required in the engineering discipline.
TK4	Engineering specialist knowledge that provides theoretical frameworks and bodies of knowledge for the accepted practice areas in the engineering discipline; much is at the forefront of the discipline.
TK5	Knowledge, including efficient resource use, environmental impacts, whole-life cost, re-use of resources, net zero carbon, and similar concepts, that supports engineering design and operations in a practice area.
TK6	Knowledge of engineering practice (technology) in the practice areas in the engineering discipline.
TK7	Knowledge of the role of engineering in society and identified issues in engineering practice in the discipline, such as the professional responsibility of an engineer to public safety and sustainable development.
TK8	Engagement with selected knowledge in the current research literature of the discipline, awareness of the power of critical thinking and creative approaches to evaluate emerging issues.
TK9	Ethics, inclusive behavior and conduct. Knowledge of professional ethics, responsibilities, and norms of engineering practice. Awareness of the need for diversity by reason of ethnicity, gender, age, physical ability etc. with mutual understanding and respect, and of inclusive attitudes.

6.4 Criterion 4 Continuous Improvement

The program must regularly use appropriate, documented processes for monitoring, assessing and evaluating program outcomes that students and graduates of the program are attained.

The results of these evaluations must be systematically utilized as input for the continuous improvement of the program.

6.5 Criterion 5 Curriculum

The program curriculum must specify program knowledge profiles and contents appropriately and adequately in quantity and quality to serve program educational objectives and required program outcomes for each field of professional practice.

The program curriculum structure must include following areas of knowledge contents.

- 1) College level mathematics and basics sciences (including experimental experiences) appropriately to the program discipline, with combined educational work load of not less than 30 credits in semester system or equivalent to educational load of one academic year.
- 2) Basic engineering and specific engineering topics(including experimental experiences) appropriately to the program discipline to provide a bridge between mathematics and basic sciences, and basic engineering for student to appropriately use in engineering design and solving of complex engineering problems according to engineering work requirements, with combined educational work load of not less than 45 credits in semester system or equivalent to educational load of one and a half academic years.
- 3) General education that complements the technical contents of the curriculum and is consistent with program educational objectives and institutional objectives.

The program curriculum must provide engineering practice and engineering projects that allow students to have engineering design experiences and solving complex engineering in the final year of education which allow students to use the knowledge and skills acquired in earlier course work and incorporating appropriate engineering standards and multiple realistic constraints.

6.6 Criterion 6 Faculty

Educational institute must provide adequate number of faculty. The faculty must have the educational qualification with professional competence relevance to the program discipline. The faculty must also provide adequate student advisory relating to students' professional career development and other activities related with professional society and industry.

The program teaching staff must demonstrate, both academic and professional competence, regarding student advisory and student career development including teaching and student evaluation for the continuous quality improvement of teaching to achieve learning outcomes as prescribed in curriculum objectives.

6.7 Criterion 7 Facilities

The educational program must provide continuously support to the program with adequate facilities, including classrooms, laboratories, library, and other supporting infrastructure to accommodate academic environment, academic development, professional activities of student, as well as quality education. The program must continuously stimulate student learning opportunities by provision of modern tools and equipment, information technology and communication network for student and academic staff to serve requirements for academic development and extra-curriculum activities in accordance with curriculum educational objectives.

6.8 Criterion 8 Institutional Support

Institutional support and program leadership must be adequate to ensure the quality and continuity of the program. Institutional financial support provided to the program must be adequate to meet program needs. Resources available to the program must be sufficient to promote, retain,

Rule and Procedure for Accreditation of Engineering Education (3rd Revision)
Document Number: 01/2023
Revision Dated: 2 Nov 2023

and provide for the continued professional development of a qualified faculty. Resources must be sufficient to acquire, maintain, and operate infrastructures, facilities and equipment appropriate for the program, so that program outcomes can be attained. In addition, the educational institution must provide adequate supporting staff and educational services for program teaching and learning and program management.

7. Schedule

TABEE set up a schedule for program accreditation as shown in table below.

No.	Activities	Schedule
1	Educational institution submits requisition for accreditation application and program self-evaluation to COET printed in electronic document format.	1 st week of May
2	Intervenor working group reviews self-evaluation reports and notifies TABEE to issue acceptance letter for accreditation.	1 st week of June
3	Educational institution makes payment to COET for accreditation requisition.	July
4	COET appoints program evaluating teams, designated TABEE subcommittee members for coordinating program visits.	July
5	Program evaluating teams, designated TABEE subcommittee members for coordinating program visits review self-evaluation reports; consider issues needed for clarification and request for additional documents from the program.	August - September
6	COET request Educational Institution explanation on issues for clarification and supporting documents, and Educational Institution submits requested documents.	4 th week of September
7	Program evaluating teams, designated TABEE subcommittee members for coordinating program visits review explanation on clarification issues and additional support documents from the educational institution.	October
8	COET notifies appointment schedules for program visit and requests for payment on program visit fee.	4 th week of October
9	Educational institution makes payment for program visit fee.	November
10	Program evaluating teams, designated TABEE subcommittee members for coordinating program visits make a program visit.	November - December
11	Program evaluating team sends fact-finding report to the program for acknowledgement or else rebutting.	1 week after the program visit
12	Educational Institution submit additional explanatory note on fact finding report prior to accreditation reporting	1 week after schedule #11
13	Program evaluating team and designated TABEE subcommittee prepare and send accreditation report and suggestions to intervenor working group for report review.	February

No.	Activities	Schedule
14	Intervenor working group reviews accreditation report and send back to program evaluating team for revision.	March
15	COET arranges decision meeting on the accreditation result.	March
16	TABEE subcommittee approves on list of accreditation result.	April
17	COET endorses on accreditation result	May
18	COET notifies educational institution for the accreditation result.	May

8. Program Curriculum Eligible to Accreditation

Program curriculum eligible to TABEE accreditation is characterized in Section 3.3 as followings.

- 1) full-time curriculum
- 2) new curriculum
- 3) multi-disciplinary curriculum
- 4) curriculum with optional courses
- 5) curriculum with several campus sites
- 6) curriculum under cooperation between educational institutions domestically and with international institutions

The full-time curriculum, or equivalent to a curriculum at bachelor degree level that is approved by the educational institutional board, must be or equivalent to 4 years educational program with total credits for graduation of not less than 120 credits in semester system according to curriculum specification announced by The Commission on Higher Education Standards (CHES) or other relevant regulating authority for quality of higher education.

The engineering program curriculum must have curriculum structure that includes knowledge profiles and contents and application of; college level basic sciences and mathematics, basic engineering and specific engineering topics for engineering design and solving of complex engineering problems sufficiently for engineering professional practice. The program curriculum must provide engineering practice and engineering projects that allow students to have engineering design experiences and solving complex engineering in the fourth year of education which allow students to use the knowledge and skills acquired in earlier course work and incorporating appropriate engineering standards under constraints of the professional practice.

The outcomes-based program curriculum must emphasis on student's program outcomes according to prescribed TABEE criteria and must have full-time students studying in all program classes with at least 2 classes of program graduates.

9. Application, Documentation, and Preparation Prior to Program Visit

An educational institution applying for program accreditation should submit requisition letter for program accreditation together with program self-evaluation report and supporting documents, printed in electronic document format, to COET according to accreditation schedule described within this document or according to COET announcement on changing of the schedule.

In case that the program self-evaluation report does not follow report template, insufficient quality or lack of required contents and support documents as they are described in this document, TABEE shall notify rejection of accreditation application to the educational institution and the educational institution should re-submit application for program accreditation with revised program self-evaluation report for the next academic year.

The educational institution should submit additional support documents requested by COET in time according to the schedule. In case of inappropriately delay submission of document, the program evaluating team may consider postponing or cancelling the program visit accordingly.

The educational program should carry out readiness review prior to self-evaluation reporting and program visit as following;

- 1) Review the TABEE prescribed accreditation requirements and criteria for the accreditation cycle year as they are specified in “Rule and Procedure for Accreditation of Engineering Education” and establishes essential educational quality work processes for achievement of curriculum objectives and program outcomes.
- 2) Review and examine effectiveness of quality processes which lead to continuous quality improvement.
- 3) Documentation and data collecting; program management plans, minute of meetings, operational guidelines, work reports, assessment and survey reports relating to program outcomes, and including student survey, alumni survey, and stakeholder survey reports. The document and filings must be prepared for document review and program evaluation.
- 4) Prepare self-evaluation report together with support documents for the program accreditation, printed in electronic document format, and submits to COET Website: <https://service.coe.or.th/instituteAuthen/institutelogin> according to TABEE accreditation schedule.
- 5) During the program visit, the educational program must comprehensively prepare all program course files (course portfolio) containing; course syllabus, course teaching plan, knowledge content, teaching note, references, home works, problems, assignments, study reports, course evaluation, examples of examination paper, and examples graded examination answer sheets. The document must be ready for program evaluating team to cross-check various program course learning outcomes and the program outcomes.
- 6) During program supporting laboratory visit, the educational program must provide, for evaluator cross-checking the evident and document support to demonstrate the usage and maintenance of laboratory equipment containing; name of responsible staff,

Rule and Procedure for Accreditation of Engineering Education (3rd Revision)

Document Number: 01/2023

Revision Dated: 2 Nov 2023

laboratory equipment works schedule, laboratory and equipment instruction manual, safety manual, list of experiment and instruction, experiment problems, example of experiment.

7) Program must provide written explanation to all questions from evaluator.

The program evaluation team shall evaluate program outcomes and effectiveness program quality management according to the program evaluation checklist based on; program self-evaluation report, support documents and referenced program quality evaluation reports, program reference documents, reports and program data recordings.

10. Accreditation Administration

TABEE secretariat office is responsible as administrative work of program accreditation. The office shall coordinate among program evaluating teams and the educational programs for appointment, meeting, document filing, and report forms to ensure transparency and achievement of program accreditation according to accreditation schedule.

11. Accreditation Result and Reporting

Each program evaluating team shall meet with related designated subcommittee for program visit and reporting according to Section 5.3 Accreditation Reporting

The program accreditation results are listed as follows.

- 1) Full accreditation for accreditation cycle of 6 years.
- 2) Accreditation with requirements for a period not exceeding 3 years. Review report on program improvement is required for program monitoring.
- 3) Provisional accreditation (For the new program curriculum which does not have program graduate.). The provisional accredited program must submit program self-evaluation report after completing 2 classes of program graduation.)
- 4) Defer accreditation.
- 5) Decline accreditation or revoke accreditation.

Detailed description of accreditation result and conditions is tabulated in accreditation result table as followings.

Accreditation Result Table	
Accreditation Status	Full accreditation
Period	6 years
Requirements	None
Findings	All accreditation criteria met, may have suggestions
Program Reporting Obligations	Interim report(after 3 years) and/or report on improvement and significant development based on accreditation suggestions.
TABEE Follow-Up Review	EAC-TABEE appoints reviewer to read interim report.

Expected Outcome of Follow-Up Review	No change to accreditation status, unless there are the major program changes in program objectives and program outcomes.
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Accreditation Result Table	
Accreditation Status	Accreditation with requirements
Period	Not more than 3 years (1-3 years depending on time requirement for improvement to be addressed.)
Requirements	<ol style="list-style-type: none"> 1. Last program evaluating team or 1 selected evaluator reviews or new appointed program evaluating team, reviews Self-Evaluation Report and supporting documents showing requirements have been met. 2. Report review may include, <ol style="list-style-type: none"> 1) Program visit and/or, 2) Review Self-Evaluation Report for program accredited with requirements to evaluate that requirements have been met and /or, 3) Program executive meeting for demonstration of program improvement on the requirements.
Findings	One or more accreditation criteria are found weakness, need for improvement are suggested.
Program Reporting Obligations	Self-Evaluation Report for program accredited with requirements and supporting documents demonstrating requirements have been met.
TABEE Follow-Up Review	Program evaluating team reviews Self-Evaluation Report according to requirements and report to EAC and next to TABEE for approve of accreditation result.
Expected Outcome of Follow-Up Review	<ol style="list-style-type: none"> 1. Upon completing requirements, TABEE may approve full accreditation status to be 6 years from previous full program evaluation. 2. If requirements not met, TABEE may consider continuing accreditation with requirements, or defer accreditation, or else decline accreditation or revoke accreditation.

Accreditation Result Table	
Accreditation Status	Provisional accreditation
Period	Not more than 3 years
Requirements	N/A
Findings	<ol style="list-style-type: none"> 1. New curriculum offered not less than 3 years and do not have program graduates 2. Development of the program outcomes is undertaken and it is likely that program can satisfy accreditation requirements by the time student graduates. 3. Evaluator team may have suggestions for improvement.
Program Reporting Obligations	N/A

TABEE Follow-Up Review	N/A
Expected Outcome of Follow-Up Review	Program prepares Self-Evaluation Report and apply for accreditation upon completing 2 graduation classes

Accreditation Result Table	
Accreditation Status	Defer accreditation
Period	1 year
Requirements	N/A
Findings	<ol style="list-style-type: none"> 1. One or more accreditation criteria are not met (deficiency), requires suggest on improvement 2. Do not have assessment on program outcomes, do not have or cannot confirm program outcomes (graduate attributes) on course portfolio
Program Reporting Obligations	Revise Self-Evaluation Report and supporting documents and improve on weaknesses and deficiencies.
TABEE Follow-Up Review	Same program evaluating team carries out SER review and re-program visit.
Expected Outcome of Follow-Up Review	TABEE may consider either decline accreditation or revoke accreditation or award accreditation.

Accreditation Result Table	
Accreditation Status	Decline accreditation or revoke accreditation
Period	Requires at least 2 years for improvement. Need re-application for accreditation and submission of self- evaluation report
Requirements	N/A
Findings	<ol style="list-style-type: none"> 1. Program does not have assessment on program outcomes, do not have or cannot confirm program outcomes (graduate attributes) on course portfolio. 2. Program outcomes do not match accreditation criteria. 3. Program outcomes assessments and course portfolio are not adequately recorded for the program evaluating team to consider completion of the accreditation review accordingly to accreditation schedule. 4. Program cannot improve on weaknesses or deficiencies after last defer accreditation.
Program Reporting Obligations	N/A
TABEE Follow-Up Review	N/A
Expected Outcome of Follow-Up Review	N/A

12. Appeal

An educational program that is considered declined or revoked accreditation, may appeal for the reconsideration of accreditation result by filing an appeal request with factual document to TABEE within 30 days from the stamped receiving date of accreditation result letter.

TABEE as a subcommittee shall review the appeal request by considering the additional factual documents submitted by the educational program within 60 days from the stamped date of receiving appeal request. The decision on the appealed accreditation result is considered final.

13. Publicity of Accredited Program

The TABEE secretariat office is responsible for registration TABEE accredited program. The list of accredited engineering programs shall be published on the Council of Engineers Thailand website at: www.coe.or.th

14. Assistance to Educational Institution

An educational institution seeking for the Council of Engineers Thailand for assistance or advisory on development of new program curriculum or improvement of program curriculum prior to application for program accreditation, may request TABEE suggestion for professional advisor who has experiences in program accreditation to participate in program advisory panel. The nominated professional advisor by TABEE may review, comment or report to the program indicating program quality management and readiness of the program for accreditation.

The educational institution is expectedly shall be responsible for all costs associated with advisory reports and arrangements relating to the activity of nominated advisor from the Council of Engineers Thailand.

The TABEE nominated advisor on advisory panel shall not pose conflict of interest with the program. As a result, he/she would not be later appointed as program evaluator of the program under his/her advisory, or even be as pointed as a designated TABEE subcommittee member coordinating program visit of the program under his/her advisory.

The advisory report and guidance made by nominated advisor shall not be taken as assurance or reference for that program during the TABEE program accreditation.

TABEE does not recommend that TABEE nominated advisor be appointed as a member of industrial advisory board that may influence the program management and consequentially may lead to conflict of interest. However, TABEE may otherwise nominate professional practitioner from related industry or from related professional society that may be benefit to the program management.

15. List of Accreditation Documents

No.	Document	Used by
1	Rule And Procedure for Accreditation of Engineering Education	educational institution, COET, TABEE subcommittee, working group, program evaluating team
2	Template for Self-Evaluation Report	Educational institution
3	Program Evaluation Checklist	Program evaluating team
4	Request Form for Program Clarification and Additional Document	Program evaluating team for preliminary document review
5	Appointment Form for Program Visit	Program evaluating team for program visit
6	Template for Accreditation Report	Program evaluating team for accreditation reporting

16. Attachment

1. Terms and Definitions
2. Template for Program Self-Evaluation Report
3. Checklist for Program Evaluation
4. Template for Accreditation Report
5. Description of Knowledge Contents for Basic Engineering and Specific Engineering
6. Council of Engineers Regulations for Recognition of Degree, Certificate or Diploma, Pertaining to the Regulated Engineering Practices (2nd Amendment) 2018
7. Council of Engineers Rule on Accreditation of Engineering Education 2017
8. Washington Accord Graduate Attributes and Knowledge Profiles

Attachment 1

Terms and Definitions

#	Terms	Explanation
1	Engineering program accreditation	An evaluation process on quality of educational program outcomes and effectiveness of program management that the Council of Engineers Thailand carries out for educational institutions in Thailand upon request for program accreditation, to confirm that graduate of the engineering program has adequately attained graduate attributes required in engineering professional practice.
2	Engineering program	The engineering program includes program curriculum, curriculum structure, program courses, program management, faculty, teaching assistance, laboratory instructor, supporting staff, teaching and learning infrastructure, and the use of program resources to attain the program graduate attributes according to prescribed curriculum objectives.
3	Accreditation result	The consideration of TABEE Subcommittee given to an educational program and/or academic institution. The result of accreditation includes; full accreditation, accreditation with requirements, provisional accreditation, defer accreditation, decline accreditation or revoke accreditation.
4	Program evaluator team, program evaluator panel	A team of academia and engineering professional practitioner that have been accepted by an educational program to evaluate program outcomes and program quality management and prepare accreditation report according to accreditation criteria and report template for the accreditation of engineering educational program.
5	Assessment, evaluation	A process of systematic monitoring and evaluation of program management includes review of work processes, operational documents, teaching documents, exercise, examination papers, teaching evaluation and reports, for consideration of program management quality, whether the program has attained curriculum objectives, program outcomes and continuous improvement.
6	Graduate attributes	Educational program outcomes, that specify scope of knowledge, professional competence and skill, attitude and behavior of program graduates that are required for engineering professional practice.
7	Learning outcome	Outcomes that students are expected to attain from studying the program courses. The learning outcomes should conform to behavioral objectives described in course syllabus. The learning outcomes combining the extra-curriculum activities should assist students to attain program graduate attributes.

#	Terms	Explanation
8	Self-evaluation report, self-assessment report	A documental report which an educational program seeking for accreditation has prepared and combining with factual documents according to prescribed self-evaluation report template and submit to TABEE secretariat office for the use of program evaluation. The report shows work system and quality of educational program management, learning outcomes, monitoring and assessment of the program outcomes to achieve curriculum objectives and program graduate attributes in accordance with prescribed accreditation criteria.
9	Accreditation cycle	A 6-year period of accreditation cycle. Upon completing of accreditation period, The program must request for accreditation of the next accreditation cycle according to the prescribed accreditation criteria of the next accreditation cycle.
10	Course portfolio	Program course files containing; course syllabus, course teaching plan, knowledge content, teaching note, references, home works, problems, assignments, study reports, course evaluation, examples of examination paper, and examples graded examination answer sheets.
11	Quality cycle	The Deming Cycle: Plan – Do – Check – Act; process and operational planning on activities and projects; review and assessment of activities and project outcomes; and using that of activities or projects outcome assessment requirements for correction used for continuous quality improvement.
12	Program visit, site visit, on site visit	The program evaluation requires a program evaluator team to evaluate the educational program quality at program location to review classroom, the use of educational resources, academic environment, and to interview faculty, supporting staff and students to confirm the quality of education management as described in the self-evaluation report. The team of 3 program evaluators, consisting of academia and engineering professional practitioner relating to the program field of specialization, shall carry the program visit according to prescribed schedule.
13	Observer	External/ invited guests to monitor on program evaluator team during the program visit. Observer is not allowed to participate in questioning, or make comment, or participate in team decision during the program visit.

#	Terms	Explanation
14	Complex engineering problem	<p>Engineering problems which cannot be resolved without in-depth engineering knowledge, much of which is at, or informed by, the forefront of the professional discipline, and have some or all of the following characteristics:</p> <ol style="list-style-type: none"> 1. Involve wide-ranging or conflicting technical, engineering and other issues. 2. Have no obvious solution and require abstract thinking, originality in analysis to formulate suitable models. 3. Requires research-based knowledge much of which is at, or informed by, the forefront of the professional discipline and which allows a fundamentals-based, first principles analytical approach. 4. Involve infrequently encountered issues. 5. Are outside problems encompassed by standards and codes of practice for professional engineering. 6. Involve diverse groups of stakeholders with widely varying needs. 7. Have significant consequences in a range of contexts. 8. Are high level problems including many component parts or sub-problems. <p>(by IEA GA and Professional Competencies)</p>
15	Complex engineering activities	<p>Complex activities means (engineering) activities or projects that have some or all of the following characteristics:</p> <ol style="list-style-type: none"> 1. Involve the use of diverse resources (and for this purpose resources includes people, money, equipment, materials, information and technologies). 2. Require resolution of significant problems arising from interactions between wide-ranging or conflicting technical, engineering or other issues, 3. Involve creative use of engineering principles and research-based knowledge in novel ways. 4. Have significant consequences in a range of contexts, characterized by difficulty of prediction and mitigation. 5. Can extend beyond previous experiences by applying principles-based approaches. <p>(by IEA GA and Professional Competencies)</p>
16	Broadly-defined Problems	<p>Engineering problems which cannot be pursued without a coherent and detailed knowledge of defined aspects of a professional discipline with a strong emphasis on the application of developed technology, and have the following characteristics:</p>

#	Terms	Explanation
		<ol style="list-style-type: none"> 1. Involve a variety of factors which may impose conflicting constraints. 2. Can be solved by application of well-proven analysis techniques. 3. Requires a detailed knowledge of principles and applied procedures and methodologies in defined aspects of a professional discipline with a strong emphasis on the application of developed technology and the attainment of know-how, often within a multidisciplinary engineering environment. 4. Belong to families of familiar problems which are solved in well-accepted ways. 5. May be partially outside those encompassed by standards or codes of practice. 6. Involve several groups of stakeholders with differing and occasionally conflicting needs. 7. Have consequences which are important locally, but may extend more widely. 8. Are parts of, or systems within complex engineering problems. <p>(by IEA GA and Professional Competencies)</p>
17	Broadly-defined Activities	<p>Broadly defined activities means (engineering) activities or projects that have some or all of the following characteristics:</p> <ol style="list-style-type: none"> 1. Involve a variety of resources (and for this purposes resources includes people, money, equipment, materials, information and technologies). 2. Require resolution of occasional interactions between technical, engineering and other issues, of which few are conflicting. 3. Involve the use of new materials, techniques or processes in non-standard ways. 4. Have reasonably predictable consequences that are most important locally, but may extend more widely. 5. Require a knowledge of normal operating procedures and processes. <p>(by IEA GA and Professional Competencies)</p>
18	Basic sciences	<p>Study of natural system and phenomena, based on systematically study of proven discovery, factual findings, and experimentation of lives and substances. Basic sciences can be categorized as physical science, biological science, and social science.</p>

#	Terms	Explanation
19	Mathematics	Knowledge, study, learning includes the study of such topics as quantity, structure, space and change. Mathematics seek and use pattern to formulate new conjectures ,they resolve the truth or falsity of conjectures by mathematical proof. Mathematics is a tool in study of sciences and engineering.
20	Program, educational program	An educational administrative unit set up by educational institution, including program chair, program management team, lecturer, teaching assistant, and supporting staff who organize educational tasks to achieve predetermined educational program objective that allow program graduate to attain required attributes. Program educational teaching and learning activities can be collectively described in program curriculum which include curriculum structure, described courses, units, or modules. A program may have major field of study, options or tracks.
21	Faculty	An educational administrative unit within university represents a group of university departments concerned with a major division of knowledge. Faculty is also referred to a responsible person for program teaching and learning, research, academic services relating to division of knowledge.
22	Program outcomes, program learning outcomes	Program learning outcomes actively describe knowledge, skills, and values graduates will be able to put into practice as a result of what they have learned in the program. Program learning outcomes also clarify the program's purpose and objectives for students and instructors to improve communication, shared expectations, and program coherence.
23	Program educational objectives	Program educational objectives are the broad statements that describe the career and professional accomplishments that the program is preparing graduates to achieve (3-5 years).
24	Capstone Design Course/Project	Capstone design course/project is an arrangement of a single or a combined courses that requires a group of 3-5 students to work on assignment project relating to engineering design and solving complex engineering problem in the final year of education. The capstone design project allows students to use the knowledge and skills acquired in earlier course work and incorporating appropriate engineering standards and multiple realistic

#	Terms	Explanation
		constraints. The project should require integration of at least 2 areas of engineering knowledge.
25	Knowledge profile	Outline and contents knowledge of the program curriculum, which are necessarily provided to program students through program teaching and learning activities, so that program student can achieve the expected program outcomes.

Attachment 2
Template for Program Self-Evaluation Report

(Translated Document)

Template for Program Self-Evaluation Report

Document For

Application of Accreditation of Engineering Program

6-Year Accreditation Cycle

Starting Academic year 2024

Prepared by

The Council of Engineers Thailand

1616/1 Lat Phrao Road,

Wangthonglang District, Bangkok 13010.

Website: <http://www.coe.or.th>

General Instruction

1. Guidelines for program self-evaluation report are developed to assist the program seeking for accreditation to use as a template for the self-evaluation report writing which is required by the Council of Engineers Thailand.
2. Name of the program which is printed on the report cover page must be exactly written in the same wording as it is approved for the program degree and in the same wording that is printed on an academic transcript and in the program published bulletin.
3. In the case that terminology used in self-evaluation report differs from the terminology used by the educational institute, terms and definitions should be clarified for understanding.
4. In case that curriculum tables and information are changed from tables and information given in the report, footnote or remarks of the table must be given for explanation.
5. The symbol "{word}" indicates that the program is required to prepare relevance statement or explanation replacing the symbol "{word}" on the program report template.
6. The explanation given on the report headings is printed in *italic font*.

Submission of Program Self-Evaluation Report

The educational program applying for accreditation must submit a copy of program self-evaluation report together with supporting documents, in printed electronic document format to COET Website: <https://service.coe.or.th/instituteAuthen/institutelogin>

Supporting Document Together with Program Self-Evaluation Report

Supporting document together with the self-evaluation report consists of

1. Program curriculum document which is approved by the board of the educational institution or else is approved by Office of The Higher Education Commission.
2. Publicized program curriculum or the general institution catalog covering course details and other institutional information applicable at the time of the review.
3. Official academic transcripts of recent graduates (1-2 years) and checklist completion of program graduation. The transcript must be accompanied by the program requirements for graduation and worksheets that the program uses to show how the graduate has fulfilled program requirements.
4. Supporting documents attached to the self-evaluation report.

Confidentiality Statement

The program self-evaluation report together with supporting documents used in program evaluation for TABEE accreditation is confidential. They are not allowed for public disclosure without written permission from the educational program, except tables and data of general information that do not specifically refer to program name or education institution.

Template for Program Self-Evaluation Report

The program may prepare self-evaluation report using report headings, tables, figures and data according to description given in the template as following;

Program Self-Evaluation Report

For 6-Year Accreditation Cycle

Starting Academic Year 2024

Submitted to

Thailand Accreditation Board of Engineering Education (TABEE)

Council of Engineers Thailand

For Accreditation of Engineering Program

{Program Name}

{Program Discipline/ Major}

{University Name}

{Address}

{Date}

Confidentiality Statement

The program self-evaluation report together with supporting documents used in program evaluation for TABEE accreditation is confidential. They are not allowed for public disclosure without written permission from the educational program, except tables and data of general information that do not specifically refer to program name or education institution.

TABLE OF CONTENTS

Page

Part 1. General Information	
Part 2. Criterion 1	Students
Part 3. Criterion 2	Program Educational Objectives
Part 4. Criterion 3	Program Outcomes
Part 5. Criterion 4	Continuous Improvement
Part 6. Criterion 5	Curriculum
Part 7. Criterion 6	Faculty
Part 8. Criterion 7	Facilities
Part 9. Criterion 8	Institutional Support
Part10. Attachments	
Attachment 1	Program Curriculum
Attachment 2	Program Course Syllabus
Attachment 3	Faculty Qualifications
Attachment 4	Classrooms, Library, Equipment and Laboratory
Attachment 5	Institutional Information

Program Self-Evaluation Report

{Program Name}

{Program Discipline/ Major}

{Degree Name}

{University Name}

Part 1. General Information

1. Program Name

Specify program name and engineering discipline/ major of the educational program which offers to students correspondingly both in Thai and in English.

2. Degree Name and Program Discipline

Specify full degree name and degree abbreviation correspondingly both in Thai and in English in accordance with university's regulation of which conforms to Announcement relating to Criteria on Degree Name and Degree Abbreviation published by Office of The Higher Education Commission, or the Office of Permanent Secretary, Ministry of Higher Education, Sciences, Research, and Innovation.

3. Program Discipline or Program Major Requesting for Accreditation

Specify program discipline or program field, branch or major or even for multidiscipline area that the program request for accreditation.

4. Name of Responsible Staff and Contact Address

Specify name of responsible staff, address, telephone number, fax number and e-mail address for the TABEE to contact and communicate for program visit such as; Dean, Department Head and Program Chair according to the table given below.

No.	Name	Position	Telephone	e-mail

*Rule and Procedure for Accreditation of Engineering Education (3rd Revision)
Document Number: 01/2023
Revision Dated: 2 Nov 2023*

5. Program History

Specify when the program was started and briefly describe list of curriculum changes and revisions by highlighting on modification that has taken place after the previous program evaluation. Please also indicate the university board approval date on the program requesting for accreditation. In case that the program has been accredited or evaluated for quality education, please specify name of organization and the date of accreditation.

6. Cooperation with other organization/ industries/or other educational Institution

Specify whether the program requesting for accreditation is directly responsible for program teaching or else the program is cooperative program between educational institution and other organization/industry or another educational institution. Name of cooperative organization/educational institution.

7. Campus location

Describe clearly where the program courses and classrooms are held. In case of having cross-campus program or having classroom arrangement in another campus, list all the campus locations that offer the program courses and clearly indicate which program campus is requesting for accreditation.

8. Public Disclosure

Provide information concerning all the places; where the program educational objective, expected learning outcomes, program outcomes, annual student enrollment and graduation data are posted or made accessible to the public. For information posted on the Web, please provide the URLs.

9. Summary and Suggestion(s) for Improvement from Previous Evaluation(s) and Report on Actions Taken for improvement.

Summarize issues and suggestion for improvement from previous accreditation report including; weaknesses, concerns, observations, and suggestions for improvement. Describe the actions taken for the program improvement, including effective dates of actions. If this is an initial accreditation, please also note so.

Part 2. Criterion 1 Students

1. Criteria for Student Admission to The Program

- 1.1 Describe criteria and method for student admission into the program.*
- 1.2 Specify number of students admitted to the program and minimum four years admission plan with different criteria.*
- 1.3 Describe assessment on performance of the program students from different program admission criteria to improvement on the criteria of program admission. (This assessment can use data from program students' grade performance with different criteria on program admission plan.)*
- 1.4 Explain improvement on criteria for program admission based on program requirement*

In case that admission system does not allow program the selection of student performance as required. Please explain how the program plans an activity to improve knowledge base of students entering to the program.

2. Evaluating Student Performance

- 2.1 Describe the process by which student performance and program graduate are evaluated and monitored for attainment of program outcomes and student learning outcomes. Please also demonstrate number of students in each class and program graduates for at least two consecutive academic years.*
- 2.2 Explain the result on student learning outcomes assessment (particular to student monitoring system on the courses with prerequisite condition). Demonstrate exemplar document and reports.*

3. Student Transfer and Course Credit Transfer

In case of student transfer, summarize the requirements and process for accepting transfer students and transfer course credit from other institution.

4. Advising and Guidance Relating to Professional Activities

- 4.1 Describe the process and responsible program faculty for academic advising and providing guidance to students relating to course teaching and learning, extra curriculum activity, as well as professional activity and practice. Include information on how often students are advised, advisory schedule, and warning system when certain student requires academic attention.*
- 4.2 The program may also demonstrate number of student advisor, number student advisee, advisory schedule and frequency, number of students per advisor, table showing activity and participation of student in that activity including exemplar document.*

5. Credit Transfer for joint academic program between educational institution and another organisation

Describe the requirements and process for awarding/transfer credit for study in other institution or another organisation; including professional practicing, training, student exchanging program, etc. domestically or overseas under cooperative project.

6. Graduation Requirements

Describe the graduation requirements for the program and the process for ensuring and documenting that each graduate completes all graduation requirements for the program.

7. Transcripts of Recent Graduates

The program will provide academic transcripts from some of the most recent graduates for each program options or tracks along with any needed explanation of how the transcripts are to be interpreted.

(These exemplar transcripts (without or cross-out graduate's name) should be submitted to program evaluator team leader separately from the self-evaluation report.)

Part. 3 Criterion 2 Program Educational Objectives

1. Institutional Mission

Provide the institutional mission statement.

2. Program Educational Objectives

List the program educational objectives (PEO) and program outcomes (PO)

Illustrate publicity document relating to the program educational objectives and program outcomes on website where these can be searched by the public.

3. Consistency of the Program Educational Objectives with the Mission of the Institution

Describe how the program educational objectives are consistent with the mission of the institution which educational targets are emphasized on the attainment of students' learning outcomes. (This information may be illustrated in description and table showing alignment between program educational objectives (PEO) and institutional mission.)

4. Program Constituencies

4.1 List the program constituencies with detail description.

4.2 Describe how the program educational objectives meet the needs and requirements of these constituencies (which may be periodically and systematically derived from meetings with Industrial Advisor Committee(IAC), alumni and others).

5. Process for Review of the Program Educational Objectives

5.1 Describe the process that periodically and systematically reviews the program educational objectives through involvement of various constituencies (including industrial advisory committee (IAC)).

5.2 Explain how this process is systematically utilized to ensure that the program's educational objectives remain consistent with the institutional mission and the program constituents' needs. (Information and data should be derived from summary and reports of annual assessment on all program outcomes.)

Part 4. Criterion 3 Program Outcomes

1. Program Outcomes

1.1 Demonstrate list the program outcomes or student outcomes and indicate where the program outcomes or student outcomes are located in curriculum documents and program documents.

1.2 Mapping linkage between program outcomes(PO) and program required courses.(This may be illustrated by a table showing alignment between program outcomes(PO) and program require courses.)

If the program outcomes or student outcomes are stated differently than those listed in Criterion 3 of (TABEE's Criterion 3), the educational program must provide a mapping between the curriculum's program outcomes and the program outcomes or student outcomes listed in Criterion 3(TABEE's Criterion 3) and show mapping TABEE's program outcomes stated in Criterion 3 with the program required courses. These mapping may be expressed in explanatory description and/or in table for clear understanding.

2. Relationship of Program Outcomes to Program Educational Objectives

Explain how the program outcomes or student outcomes for the program prepare graduates to attain professional attributes as they are described in the program educational objectives. This may be illustrated by using a table mapping program outcomes (PO) with program educational objectives (PEO).

If the program outcomes or student outcomes are stated differently than those listed in Criterion 3 of (TABEE's Criterion 3), the educational program must provide a mapping the curriculum's program educational objectives (PEO) with the program outcomes or student outcomes listed in Criterion 3(TABEE's Criterion 3).

Part 5. Criterion 4 Continuous Improvement

1. Program Outcomes

Description and tables may be used to present the following information:

1.1 A listing and description of assessment processes (direct assessment and in-direct assessment) which are used in the assessment of each program outcome as stated in TABEE criterion 3 (11 Pos) such as; data collecting processes including specific exam questions used in the course learning outcomes assessment, course portfolio, student portfolio, internally developed assessment exams, engineering project presentation, review exams by other agencies, oral exams, focus group interview, industrial advisory committee meetings, or other processes that are relevant and appropriate to the program, as well as list of program courses that are required for assessment of each TABEE's criterion 3 program outcome.

1.2 Number and the frequency with which these assessment processes are carried out for each program outcome as stated in TABEE criterion 3. Describe assessment tools for each program outcome assessment with exemplar on course learning outcomes assessment for that program outcome.

Each program outcomes assessment must utilize at least 3 assessment methods consisting both direct assessment and indirect assessment.

Specifically, each PO1 to PO3 must have at least 2 direct assessments, and

each PO4 to PO11 must have at least one direct assessment.

(i.e. each Pos 1-3: Minimum 2 direct and 1 indirect assessment; each Pos 4-11: Minimum 1 direct and 2 indirect or Minimum 2 direct and 1 indirect assessment.)

1.3 The expected level of attainment for each of program outcome as stated in TABEE criterion 3.

1.4 The results of the assessment on level of attainment for each of program outcome as stated in TABEE criterion 3.

1.5 The program outcomes assessment data must be of at least 2 consecutive academic year.

1.6 Summary of various assessment methods of each program outcome as stated in TABEE criterion 3, and analysis on achievement of improving attainment level for each program outcome.

1.7 Description of recording and keeping of program outcomes and course learning outcomes assessment whereas educational program must be able to demonstrate details of outcomes assessment which can be reviewed either in form of embedded

Rule and Procedure for Accreditation of Engineering Education (3rd Revision)

Document Number: 01/2023

Revision Dated: 2 Nov 2023

questions attached to the Self-Evaluation Report or assessment documents attached to course portfolio.

2. Continuous Improvement

2.1 Describe and illustrate evident on assessments of students' attainment on each program outcome as stated in TABEE criterion 3 (11Pos) and other evident from each academic year that program outcomes assessment data has been carried out and systematically utilized for continuous improvement of the program.

2.2 Demonstrate process for continuous improvement such as; program administration procedure that allow program administrative team to utilize all result of evaluations and assessments to improve teaching and learning at course level and at program level with feedback procedures for course improvement.

2.3 Describe program improvement as a result program outcomes assessment, and describe program development plan as well as future review of program curriculum which is the result of last program evaluation such as; a procedure for utilizing result of program outcomes to obtain comments from program constituencies(students and EAC) for next curriculum review(changing PEO) and providing, and a brief rationale and concepts of planned changes at both course level and program level.

3. Additional Information

Copies of any of the assessment reports, or materials referenced in criterion 4 must be available for review at the time of the program visit. Other information such as; course portfolio, minutes from meetings where the assessment results were evaluated and where recommendations for improvement and action were made could also be included.

Part 6. Criterion 5 Curriculum

1. Program Curriculum

- 1.1 *Complete curriculum detailed description as shown in following Table 5-1. The detailed description includes description of program track or option, information on curricular structure, knowledge contents, course and credit offerings in the form of a recommended study plan by year and semester along with maximum section enrollments for all courses in the program. If there is more than one program track or option for a program curriculum, a separate Table 5-1 must be provided for each track or option. State whether the institution operates on quarters or semesters.*

In case of program outcomes assessment as described in criterion 4, the annually collected course learning outcomes are obtained from courses with different revision of program curricula, the program must describe both revisions of program curriculum.

- 1.2 *Describe alignments between courses outcomes and knowledge profiles described in curriculum detailed description and the program educational objectives.*

- 1.3 *Describe how the curriculum and its associated prerequisite structure support the attainment of the program outcomes. The prerequisite structure of the program's required courses should be illustrated in Table 5.2.*

- 1.4 *Describe how the program's knowledge profiles and the curriculum structure meets the requirements in terms of hours and depth of study for each specified subject area; i.e. 1) Mathematics and Basic Sciences, 2) Engineering Topics including basic engineering and specific engineering subjects, and 3) General Education.*

Program is allowed to demonstrate factual evident on allocated contents relating to mathematics and basic sciences in other program courses. Such factual evident must show the number of calculated credit load from full course credits based on class teaching schedule described in the related course syllabus. Endorsement letter issued by the faculty administrative unit, such as academic department is also required.

- 1.5 *Describe how the curriculum handle the major design experience and solving of complex engineering problem that prepares students for engineering practice using the knowledge and skills acquired in earlier coursework and incorporates with appropriate engineering standards and work constraints(Capstone design course).*

- 1.6 *If the program allows cooperative study course to satisfy curricular requirements and utilize that course learning outcomes as a part of solving complex engineering problem such as capstone design project, the program must show how the cooperative study course are arranged, how the program outcomes are evaluated comparing with program outcomes obtained by a student who does not taking the cooperative study course, and how the course learning outcomes respond to the program outcomes. Describe how the course learning outcomes are monitored and supervised by industrial work place and how the learning outcomes are responded to requirements of complex engineering problem.*

1.7 Describe each course learning contents and collectively arranged in course portfolio which include course syllabus, teaching notes, textbooks, exemplars of student's projects, assignments with teacher's comments, course evaluation (the exemplars on student course performance should represent student performance with good, average, and below average grade in an appropriate numbers). These course portfolios are kept available at the program for program review during the program visit and/or sent an electronic copy to program evaluating team as a part of document review prior to the program visit.

2. Course Syllabus

In Attachment 2 of the self-evaluation report, program must include a syllabus for each course used to satisfy the knowledge profiles and credit for mathematics, science, and specific engineering requirements required by Criterion 5 or by any applicable program criteria. (Course syllabus must be responding to the program course listing described in PEO and PO).

Table 5-1 Curriculum

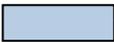
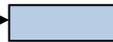
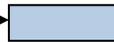
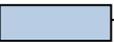
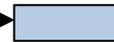
Program Name /Option

Course (Course Code, Title) <i>List all courses in the program by semester starting with the first semester of the first year and ending with the last semester of the final year.</i>	Indicate Whether Course is - Compulsory(C), - Approved Elective(A), - Free Elective (F)	Credit Hours			
		Basic Sciences & Math	Basic Engineering and Specific Engineering	General Education	Other
1st Semester					
<i>Course code, Title</i>					
2nd Semester					
<i>Course code, Title</i>					
3rd Semester					
<i>Course code, Title</i>					
4th Semester					
<i>Course code, Title</i>					
5th Semester					
<i>Course code, Title</i>					
6th Semester					
<i>Course code, Title</i>					
7th Semester					
<i>Course code, Title</i>					
8th Semester					
<i>Course code, Title</i>					
Total Credit Hours for Graduation					
Ratio of Credit Hours to Total Credit Hours					
TABEE Basic Requirements for Total Credit Hours	120	30	45	24	

Description of Course Code:

Exemplar of Table 5.2

Program Name/Option

Program Outcomes	Program Courses							
	1 st Year		2 nd Year		3 rd Year		4 th Year	
	1 st Semester	2 nd Semester	3 rd Semester	4 th Semester	5 th Semester	6 th Semester	7 th Semester	8 th Semester
Program Outcome 1								
								
								
Program Outcome 2								
								
Program Outcome 3								
Program Outcome 4								
Program Outcome 5								

Program Outcome 6-11								

Part 7. Criterion 6 Faculty

Illustrated in Attachment 3. Describe faculty qualifications including published papers, professional experiences and cooperative activity with professional society and industry

1. Faculty Qualifications

1) Fulltime Faculty

Complete Table 6.1.1, List of full-time faculty of the program who is responsible for program management, teaching, academic services, and advising.

Exemplar Table 6.1.1 Fulltime Faculty

No.	Academic Rank	Name	Degree	Field of Study	Grad. Year	Experiences (Year)

2) Part-Time Faculty

Complete Table 6.1.2, List part-time faculty who is responsible for program teaching.

Tale 6.1.2 Part Time Faculty

No.	Academic Rank	Name	Degree	Field of Study	Year	Experiences (Year)

2. Faculty Workload

Complete Table 6-2, Faculty Workload Summary and describe this information in terms of workload expectations or requirements.

Table 6.2 Faculty Workload

No.	Academic Rank	Name		Status (FT or PT)	Program Course	Load Hours/week			
						Admin	Teaching	Prof. Practice	Advising

Remark: Professional practice includes professional development and industrial services and/or professional training with national/international professional society.

3. Faculty Size

3.1 Describe the adequacy of the size of the faculty and describe the extent and quality of faculty involvement in interactions with students, student advising and counseling, university service activities, professional development, and interactions with industrial and professional practitioners including employers of students.

- 3.2 *Describe procedure and methodology to analyze the adequacy of size and quality of faculties based on program outcomes assessment, student survey, and stakeholders survey.*
- 3.3 *Describe procedure relating to student advisory including academic advice, professional advice, and student counseling (such as, new faculty orientation and periodic faculty training/seminar).*

4. Professional Development

- 4.1 *Provide detailed descriptions of professional development activities for each faculty member.*
- 4.2 *Describe process or procedure relating to professional development/practice such as; budget allocation for faculty's professional development/practice to participate in academic conference and seminar, sabbatical leave, organizing professional/industrial seminar which allow involvement of faculty, staff, and student.*

5. Authority and Responsibility of Faculty

- 5.1 *Describe the functions and responsibilities of the faculty with respect to course teaching arrangements, review of course contents, and course evaluation; their functions and responsibilities with respect to curriculum review and revision of program educational objectives, student learning outcomes, program outcomes, and level of student attainment on program outcomes as result of continuous improvement.*
- 5.2 *Describe functions and responsibilities of dean or institutional executives, program chair or program executives with respect to review and improvement of program quality for student attainment on program outcomes.*
- 5.3 *Describe each of faculty functions and responsibility toward the achievement of student attainment on program outcomes.*

Part 8. Criterion 7 Facilities

1. Offices, Classrooms and Laboratories

- 1.1 Summarize each of the program's facilities in terms of their ability to support the attainment of the program outcomes and to provide an atmosphere conducive to learning.*
- 1.2 Laboratory facilities including those containing computers and software, the associated tools, and equipment that support teaching and learning, safety device and accessories used in the laboratory and instruction. Complete Attachment 4 of self-evaluation report containing a listing of the major pieces of laboratory equipment used by the program in support of teaching and learning.*
- 1.3 Assessment on adequacy of program facilities, offices, classrooms, particularly laboratory safety devices, and safety measures to create safe environments for student to utilize program facilities, laboratories, and classrooms.*

2. Learning Center and IT System

- 2.1 Describe and list computing resources, information technology system (workstations, servers, storage, networks including software) which are used by student of the program. Include a discussion of the accessibility of university-wide computing resources available to all students via various locations such as; student housing, library, student union, off-campus, etc.*
- 2.2 State the hours the various learning centers are open to students to support attainment of program outcomes, academic activities, and professional development/practice, used by student and program faculty.*
- 2.3 Assessment on the adequacy of program facilities, learning center and computer resources, information technology system to support attainment of program outcomes.*

3. Guidance

Describe how students in the program are provided appropriate guidance regarding the use of the tools, equipment, computing resources, and laboratories.

4. Maintenance and Upgrading of Facilities

Describe the policies and procedures for maintaining and upgrading the tools, equipment, computing resources, and laboratories used by students and faculty in the program.

5. Library Services

5.1 Describe and evaluate the capability of the library (or libraries) to serve the program including the adequacy of the library's technical collection relative to the needs of the program and the faculty, the adequacy of inter-library loan and book order or subscriptions, and any other library services relevant to the needs of the program.

5.2 Assessment on the adequacy of library services.

6. Overall Comments on Facilities

Describe how the program ensures the facilities, tools, and equipment used in the program are kept up for their intended purposes. (Quality survey on user satisfaction may be included.)

Part 9 Criterion 8 Institutional Support

1. Program Leadership

1.1 Describe procedure and demonstrate evident on functions and responsibility of the university executives, institutional/faculty executives, and at program executives including program responsible faculty toward program management to ensure expected target with quality and continuous improvement of the program.

1.2 Explain how the executives and leaders (university level, institutional/faculty level) is involved in decision making that affect the program.

2. Program Budget and Financial Support

2.1 Describe procedure used to establish the program's budget, essentially based on results of program outcomes evaluation, and plan to obtain sufficient budget for program to achieve the targeted attainment.

2.2 Provide evidence of continuity of institutional support for the program, including the sources of financial support including both permanent (recurring) and temporary (one-time) funds.

2.3 Describe how teaching is supported by the institution in terms of employment funding for academic assistant, teaching assistants, course graders, teaching workshops, etc.

2.4 Describe how resources are provided to acquire, maintain, and upgrade the infrastructures, facilities, and equipment used in the program.

2.5 Assessment on the adequacy of the resources described in this section with respect to the students in the program being able to attain the program learning outcomes.

3. Staffing

3.1 Describe assessment on the adequacy of the staff including administrative, instructional, and technical.

3.2 Describe the provision on staff support from the institution

3.3 Describe and provide suggestion on recruitment, career training of supporting staff.

4. Faculty Hiring and Retention

4.1 Describe the process for hiring of new faculty.

4.2 *Describe procedure to secure resources for recruiting qualified replacement for retired faculty.*

4.3 *Describe strategies used to retain current qualified faculty.*

5. Support of Faculty Professional Development

Describe procedure and assessment on the adequacy of support for faculty professional development, how such activities such as; sabbaticals, travel, workshops, seminars, etc., are planned and supported.

Part 10. Attachments

Attachment 1 Program Curriculum

A copy of outcome-based program curriculum, approved by university board or institutional council.

Attachment 2 Program Course Syllabus

Containing all course syllabus of the program, demonstrating alignments of course learning outcomes and program outcomes.

Attachment 3 Faculty Qualifications

Containing Faculty CV, list of published papers, academic services, professional development activities, professional experience, professional license, member of professional society.

Attachment 4 Classrooms, Library, Equipment and Laboratory

Containing a listing and brief description of the major pieces of laboratory equipment used by the program in support of teaching and learning.

Attachment 5 Institutional Information

Brief information on educational institution and academic servicing units relating to teaching and learning and faculty development such as;

- *Institutional administration system*
- *Registrar and evaluation system*
- *Library service*
- *Student internship and job placement*
- *Student cooperative study center*
- *Information technology and computer network service center*
- *Equipment center*
- *Number of student enrollment and number of students on campus*
- *Number of faculty in the institution*
- *Number of supporting staff in the institution*

Attachment 3
Checklist for Program Evaluation

Checklist for Program Evaluation

Institution Name	
Program Name	
Designated TABEE Subcommittee for Program Visit Name	
Program Evaluator Team Leader Name	
1 st Program Evaluator Name	
2 nd Program Evaluator Name	
Coordinating Staff Name	
Program Visit Date	

Symbols used for program evaluation

(These symbol is used by program evaluator during program evaluation.)

Symbol	Description
D	Deficiency Program evaluator considers documentary evidence and program management on the issue does not comply with TABEE requirements. The program needs to clarify, correct, and provide explanation with evident to remove this symbol.
W	Weakness Program evaluator considers the documentary evidence and program management on the issue has some inconsistencies with TABEE requirements which affect the attainment on the program outcomes. The program needs to clarify or make corrective action for improvement.
C	Concern Program evaluator considers the documentary evidence and program management on the issue in line with TABEE requirements but there are still some points that may affect the attainment on the program outcomes. If the program later does not make corrective action for improvement, this concern may develop to be weakness in the next review.
R	Remark Program evaluator considers giving observations to the program which does not need to clarify or make corrective action.
S	Issue has been resolved Program evaluator considers the documentary evidence and program management on the issue has been satisfactorily clarified and provided with support evidence and the issue is in line with TABEE requirements. The clarification and evidence are justified to remove the symbol (D,W, or C) which was previously given.

Items	Pre-visit	Day 1	Day 2	Exit Statement	Comments
Criterion 1 Students					
1. Criteria for Student Admission to the Program <ul style="list-style-type: none"> - 1.1 Check described criteria and method for student admission into the program are in place. - 1.2 Check specified number of students admitted to the program and minimum four years admission plan with different criteria are in place. - 1.3 Check the described assessment on performance of the program students from different program admission criteria to improvement on the criteria of program admission is in place. (This assessment can use data from program students' grade performance with different criteria on program admission plan.) - 1.4 Check improvement on criteria for program admission based on program requirement is in place. - In case that admission system does not allow program the selection of student performance as required. Please explain how the program plans an activity to improve knowledge base of students entering to the program. 					
2. Evaluating Student Performance <ul style="list-style-type: none"> - 2.1 Check described the process by which student performance and program graduate are evaluated and monitored for attainment of program outcomes and student learning outcomes and program has demonstrated number of students in each class and program graduates for at least two consecutive academic years. - 2.2 Check the explained result on student learning outcomes assessment (particular to student monitoring system on the courses with prerequisite condition). Also check demonstrated exemplar document and reports. 					
3. Student Transfer and Course Credit Transfer <ul style="list-style-type: none"> - In case of student transfer, check the summarized requirements and process for 					

Items	Pre-visit	Day 1	Day 2	Exit Statement	Comments
<i>accepting transfer students and transfer course credit from other institution.</i>					
<p>4. Advising and Guidance Relating to Professional Activities</p> <ul style="list-style-type: none"> - <i>4.1 Check the described process and identified responsible program faculty for academic advising and providing guidance to students relating to course teaching and learning, extra curriculum activity, as well as professional activity and practice. Include information on how often students are advised, advisory schedule, and warning system when certain student requires academic attention.</i> - <i>4.2 Check the program may demonstrate number of student advisor, number student advisee, advisory schedule and frequency, number of students per advisor, table showing activity and participation of student in that activity including exemplar document.</i> 					
<p>5. Credit Transfer for joint academic program between educational institution and another organization</p> <ul style="list-style-type: none"> - <i>Check the described requirements and process for awarding/transfer credit for study in other institution or another organisation; including professional practicing, training, student exchanging program, etc. domestically or overseas under cooperative project.</i> 					
<p>6. Graduation Requirements</p> <ul style="list-style-type: none"> - <i>Check the described the graduation requirements for the program and the process for ensuring and documenting that each graduate completes all graduation requirements for the program.</i> 					
<p>7. Transcripts of Recent Graduates</p> <ul style="list-style-type: none"> - <i>Check the program has provided academic transcripts from some of the most recent graduates for each program options or tracks along with any needed explanation of how the transcripts are to be interpreted.</i> <p><i>(These exemplar transcripts (without or cross-out graduate's name) should be submitted to program evaluator team leader separately from the self-evaluation report.)</i></p>					

Items	Pre-visit	Day 1	Day 2	Exit Statement	Comments
Criterion 2 Program Educational Objectives					
1. Institutional Mission - <i>Check the provided the institutional mission statement.</i>					
2. Program Educational Objectives - <i>2.1 Check the listed the program educational objectives (PEO) and program outcomes (PO).</i> - <i>2.2 Check the Illustrated publicity document relating to the program educational objectives and program outcomes on website where these can be searched by the public.</i>					
3. Consistency of the Program Educational Objectives with the Mission of the Institution - <i>Check how the program educational objectives are consistent with the mission of the institution which educational targets are emphasized on the attainment of students' learning outcomes. (This information may be illustrated in description and table showing alignment between program educational objectives (PEO) and institutional mission.)</i>					
4. Program Constituencies - <i>4.1 Check the listed program constituencies with detail description.</i> - <i>4.2 Check how the program educational objectives meet the needs and requirements of these constituencies (which may be periodically and systematically derived from meetings with Industrial Advisor Committee (IAC), alumni and others).</i>					
5. Process for Review of the Program Educational Objectives 5.1 <i>Check the described process that periodically and systematically reviews the program educational objectives through involvement of various constituencies (including industrial advisory committee (IAC)).</i> 5.2 <i>Check how this process is systematically utilized to ensure that the program's educational objectives remain consistent with the institutional mission and the program constituents' needs. (Information and data should be derived from summary and reports of annual assessment on all program outcomes.)</i>					

Items	Pre-visit	Day 1	Day 2	Exit Statement	Comments
Criterion 3 Program Outcomes					
<p>1. Program Outcomes</p> <ul style="list-style-type: none"> - 1.1 Check the demonstrated list the program outcomes or student outcomes and check where the program outcomes or student outcomes are located in curriculum documents and program documents. - 1.2 Check mapped linkage between program outcomes(PO) and program required courses. (This may be illustrated by a table showing alignment between program outcomes(PO) and program require courses.) - If the program outcomes or student outcomes are stated differently than those listed in Criterion 3 of (TABEE's Criterion 3), check the educational program has provided a mapping between the curriculum's program outcomes and the program outcomes or student outcomes listed in Criterion 3(TABEE's Criterion 3) and showed mapping TABEE's program outcomes stated in Criterion 3 with the program required courses. These mapping may be expressed in explanatory description and/or in table for clear understanding. 					
<p>2. Relationship of Program Outcomes to Program Educational Objectives</p> <ul style="list-style-type: none"> - Check how the program outcomes or student outcomes for the program prepare graduates to attain professional attributes as they are described in the program educational objectives. This may be illustrated by using a table mapping program outcomes (PO) with program educational objectives (PEO). - If the program outcomes or student outcomes are stated differently than those listed in Criterion 3 of (TABEE's Criterion 3), check the educational program has provided a mapping the curriculum's program educational objectives (PEO) with the program outcomes or student outcomes listed in Criterion 3 (TABEE's Criterion 3). 					

Items	Pre-visit	Day 1	Day 2	Exit Statement	Comments
Criterion 4 Continuous Improvement					
<p>1. Program Outcomes</p> <ul style="list-style-type: none"> - <i>Check description and tables has presented the following information:</i> - <i>1.1 A listing and description of assessment processes(direct assessment and in-direct assessment) which are used in the assessment of each program outcome as stated in TABEE criterion 3 (11 Pos) such as; data collecting processes including specific exam questions used in the course learning outcomes assessment, course portfolio, student portfolio, internally developed assessment exams, engineering project presentation, review exams by other agencies, oral exams, focus group interview, industrial advisory committee meetings, or other processes that are relevant and appropriate to the program, as well as list of program courses that are required for assessment of each TABEE's criterion 3 program outcome.</i> - <i>1.2 Number and the frequency with which these assessment processes are carried out for each program outcome as stated in TABEE criterion 3. Describe assessment tools for each program outcome assessment with exemplar on course learning outcomes assessment for that program outcome.</i> - <i>Each program outcomes assessment must utilize at least 3 assessment methods consisting both direct assessment and indirect assessment.</i> - <i>Specifically, each PO1 to PO3 must have at least 2 direct assessments, and</i> - <i>each PO4 to PO11 must have at least one direct assessment.</i> - <i>(i.e. each Pos 1-3: Minimum 2 direct and 1 indirect assessment; each Pos 4-11: Minimum 1 direct and 2 indirect or Minimum 2 direct and 1 indirect assessment.)</i> - <i>1.3 The expected level of attainment for each of program outcome as stated in TABEE criterion 3.</i> 					

Items	Pre-visit	Day 1	Day 2	Exit Statement	Comments
<ul style="list-style-type: none"> - 1.4 The results of the assessment on level of attainment for each of program outcome as stated in TABEE criterion 3. - 1.5 The program outcomes assessment data must be of at least 2 consecutive academic year. - 1.6 Summary of various assessment methods of each program outcome as stated in TABEE criterion 3, and analysis on achievement of improving attainment level for each program outcome. - 1.7 Description of recording and keeping of program outcomes and course learning outcomes assessment whereas educational program must be able to demonstrate details of outcomes assessment which can be reviewed either in form of embedded questions attached to the Self-Evaluation Report or assessment documents attached to course portfolio. 					
<p>2. Continuous Improvement</p> <ul style="list-style-type: none"> - 2.1 Check described and illustrated evident on assessments of students' attainment on each program outcome as stated in TABEE criterion 3 (11Pos) and other evident from each academic year that program outcomes assessment data has been carried out and systematically utilized for continuous improvement of the program. - 2.2 Check process for continuous improvement such as; program administration procedure that allow program administrative team to utilize all result of evaluations and assessments to improve teaching and learning at course level and at program level with feedback procedures for course improvement. - 2.3 Check described program improvement as a result program outcomes assessment, and describe program development plan as well as future review of program curriculum which is the result of last program evaluation such as; a procedure for utilizing result of program outcomes to obtain comments from program constituencies (students and EAC) for next curriculum review (changing PEO) and providing, and a brief rationale and concepts of planned changes at both course level and program level. 					

Items	Pre-visit	Day 1	Day 2	Exit Statement	Comments
<p>3. Additional Information</p> <p>- <i>Check copies of any of the assessment reports, or materials referenced in criterion 4 are available for review at the time of the program visit. Other information such as; course portfolio, minutes from meetings where the assessment results were evaluated and where recommendations for improvement and action were made could also be included.</i></p>					

Items	Pre-visit	Day 1	Day 2	Exit Statement	Comments
Criterion 5 Curriculum					
<p>1. Program Curriculum</p> <ul style="list-style-type: none"> - 1.1 Check curriculum detailed description as shown in following Table 5-1. The detailed description includes description of program track or option, information on curricular structure, knowledge contents, course and credit offerings in the form of a recommended study plan by year and semester along with maximum section enrollments for all courses in the program. If there is more than one program track or option for a program curriculum, a separate Table 5-1 must be provided for each track or option. State whether the institution operates on quarters or semesters. - In case of program outcomes assessment as described in criterion 4, the annually collected course learning outcomes are obtained from courses with different revision of program curricula, check the program has described both revisions of program curriculum. - 1.2 Check description and alignments between courses outcomes and knowledge profiles described in curriculum detailed description and the program educational objectives. - 1.3 Check how the curriculum and its associated prerequisite structure support the attainment of the program outcomes. The prerequisite structure of the program's required courses should be illustrated in Table 5.2. - 1.4 Check how the program's knowledge profiles and the curriculum structure meets the requirements in terms of hours and depth of study for each specified subject area; i.e. <ul style="list-style-type: none"> 1) Mathematics and Basic Sciences, 2) Engineering Topics including basic engineering and specific engineering subjects, and 3) General Education. - Program is allowed to demonstrate factual evident on allocated contents relating to mathematics and basic sciences in other program courses. Check such factual evident has showed the number of calculated credit load from full course credits based on class teaching schedule described in the related course syllabus. Check endorsement letter issued by the faculty administrative unit, such as academic department is also required. 					

Items	Pre-visit	Day 1	Day 2	Exit Statement	Comments
<p>- 1.6 If the program allows cooperative study course to satisfy curricular requirements and utilize that course learning outcomes as a part of solving complex engineering problem such as capstone design project, the program must show how the cooperative study course are arranged, how the program outcomes are evaluated comparing with program outcomes obtained by a student who does not taking the cooperative study course, and how the course learning outcomes respond to the program outcomes. Check how the course learning outcomes are monitored and supervised by industrial work place and how the learning outcomes are responded to requirements of complex engineering problem.</p> <p>1.7 Check how each course learning contents are collectively arranged in course portfolio which include course syllabus, teaching notes, textbooks, exemplars of student's projects, assignments with teacher's comments, course evaluation (the exemplars on student course performance should represent student performance with good, average, and below average grade in an appropriate numbers). These course portfolios are kept available at the program for program review during the program visit and/or sent an electronic copy to program evaluating team as a part of document review prior to the program visit.</p>					
<p>2. Course Syllabus</p> <p>- In Attachment 2 of the self-evaluation report, check program has included a syllabus for each course used to satisfy the knowledge profiles and credit for mathematics, science, and specific engineering requirements required by Criterion 5 or by any applicable program criteria. (Course syllabus must be responding to the program course listing described in PEO and PO).</p>					

Items	Pre-visit	Day 1	Day 2	Exit Statement	Comments
Criterion 6 Faculty					
1. Faculty Qualifications					
1.1 Fulltime Faculty <ul style="list-style-type: none"> - Check completed Table 6.1.1, List of full-time faculties of the program who is responsible for program management, teaching, academic services, and advising. 					
1.2 Part Time Faculty <ul style="list-style-type: none"> - Check completed Table 6.1.2, List part-time faculty who is responsible for program teaching. 					
2. Faculty Workload <ul style="list-style-type: none"> - Check completed Table 6-2, Faculty Workload Summary and describe this information in terms of workload expectations or requirements. 					
3. Faculty Size <ul style="list-style-type: none"> - 3.1 Check adequacy of the size of the faculty and describe the extent and quality of faculty involvement in interactions with students, student advising and counseling, university service activities, professional development, and interactions with industrial and professional practitioners including employers of students. - 3.2 Check procedure and methodology to analyze the adequacy of size and quality of faculties based on program outcomes assessment, student survey, and stakeholders survey. - 3.3 Check procedure relating to student advisory including academic advice, professional advice, and student counseling (such as, new faculty orientation and periodic faculty training/seminar). 					
4. Professional Development <ul style="list-style-type: none"> - 4.1 Check the detailed descriptions of professional development activities for each faculty member. - 4.2 Check process or procedure relating to professional development/practice such as; budget allocation for faculty's professional development/practice to participate in academic conference and seminar, sabbatical leave, organizing professional/industrial seminar which allow involvement of faculty, staff, and student. 					

<p>5. Authority and Responsibility of Faculty</p> <ul style="list-style-type: none"> - 5.1 Check the described functions and responsibilities of the faculty with respect to course teaching arrangements, review of course contents, and course evaluation; their functions and responsibilities with respect to curriculum review and revision of program educational objectives, student learning outcomes, program outcomes, and level of student attainment on program outcomes as result of continuous improvement. - 5.2 Check the described functions and responsibilities of dean or institutional executives, program chair or program executives with respect to review and improvement of program quality for student attainment on program outcomes. - 5.3 Check each of faculty described functions and responsibility toward the achievement of student attainment on program outcomes. - 5.4 Check faculty's educational background, qualification, academic activities or professional activities relating to professional society, industries as they are described in Attached 3 of self-evaluation report. 					
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Items	Pre-visit	Day 1	Day 2	Exit Statement	Comments
Criterion 7 Facilities					
1. Offices, Classrooms and Laboratories <ul style="list-style-type: none"> <li data-bbox="147 369 797 485">- 1.1 Check summary list of the program's facilities in terms of their ability to support the attainment of the program outcomes and to provide an atmosphere conducive to learning. <li data-bbox="147 520 813 762">- 1.2 Check laboratory facilities including those containing computers and software, the associated tools, and equipment that support teaching and learning, safety device and accessories used in the laboratory and instruction. Complete Attachment 4 of self-evaluation report containing a listing of the major pieces of laboratory equipment used by the program in support of teaching and learning. <li data-bbox="147 793 797 940">- 1.3 Check assessment on adequacy of program facilities, offices, classrooms, particularly laboratory safety devices, and safety measures to create safe environments for student to utilize program facilities, laboratories, and classrooms. 					
2. Learning Center and IT System <ul style="list-style-type: none"> <li data-bbox="147 1020 805 1255">- 2.1 Check described and list computing resources, information technology system (workstations, servers, storage, networks including software) which are used by student of the program. Include a discussion of the accessibility of university-wide computing resources available to all students via various locations such as; student housing, library, student union, off-campus, etc. <li data-bbox="147 1293 813 1440">- 2.2 Check the stated hours the various learning centers are open to students to support attainment of program outcomes, academic activities, and professional development/practice, used by student and program faculty. <li data-bbox="147 1478 805 1593">- 2.3 check assessment on the adequacy of program facilities, learning center and computer resources, information technology system to support attainment of program outcomes. 					
3. Guidance <ul style="list-style-type: none"> <li data-bbox="147 1671 797 1766">- Check how students in the program are provided appropriate guidance regarding the use of the tools, equipment, computing resources, and laboratories. 					

Items	Pre-visit	Day 1	Day 2	Exit Statement	Comments
<p>4. Maintenance and Upgrading of Facilities</p> <ul style="list-style-type: none"> - <i>Check the described policies and procedures for maintaining and upgrading the tools, equipment, computing resources, and laboratories used by students and faculty in the program.</i> 					
<p>5. Library Services</p> <ul style="list-style-type: none"> - <i>5.1 Check describe and evaluated the capability of the library (or libraries) to serve the program including the adequacy of the library's technical collection relative to the needs of the program and the faculty, the adequacy of inter-library loan and book order or subscriptions, and any other library services relevant to the needs of the program.</i> - <i>5.2 Check assessment on the adequacy of library services.</i> 					
<p>6. Overall Comments on Facilities</p> <ul style="list-style-type: none"> - <i>Check how the program ensures the facilities, tools, and equipment used in the program are kept up for their intended purposes. (Quality survey on user satisfaction may be included.)</i> 					

Items	Pre-visit	Day 1	Day 2	Exit Statement	Comments
Criterion 8 Institutional Support					
1. Program Leadership <ul style="list-style-type: none"> - 1.1 Check described procedure and demonstrated evident on functions and responsibility of the university executives, institutional/faculty executives, and at program executives including program responsible faculty toward program management to ensure expected target with quality and continuous improvement of the program. - 1.2 Check how the executives and leaders (university level, institutional/faculty level) is involved in decision making that affect the program. 					
2. Program Budget and Financial Support <ul style="list-style-type: none"> - 2.1 Check described procedure used to establish the program's budget, essentially based on results of program outcomes evaluation, and plan to obtain sufficient budget for program to achieve the targeted attainment. - 2.2 Check provided evidence of continuity of institutional support for the program, including the sources of financial support including both permanent (recurring) and temporary (one-time) funds. - 2.3 Check how teaching is supported by the institution in terms of employment funding for academic assistant, teaching assistants, course graders, teaching workshops, etc. - 2.4 Check how resources are provided to acquire, maintain, and upgrade the infrastructures, facilities, and equipment used in the program. - 2.5 Check assessment on the adequacy of the resources described in this section with respect to the students in the program being able to attain the program learning outcomes. 					
3. Staffing <ul style="list-style-type: none"> - 3.1 Check assessment on the adequacy of the staff including administrative, instructional, and technical. - 3.2 Check the described provision on staff support from the institution - 3.3 Check described and provided suggestion on recruitment, career training of supporting staff. 					

<p>4. Faculty Hiring and Retention</p> <ul style="list-style-type: none"> - <i>4.1 Check the described process for hiring of new faculty.</i> - <i>4.2 Check described procedure to secure resources for recruiting qualified replacement for retired faculty.</i> - <i>4.3 Check described strategies used to retain current qualified faculty.</i> 					
<p>5. Support of Faculty Professional Development</p> <ul style="list-style-type: none"> - <i>Check described procedure and assessment on the adequacy of support for faculty professional development, how such activities such as; sabbaticals, travel, workshops, seminars, etc., are planned and supported.</i> 					

Attachment 4
Template for Accreditation Report

Thailand Accreditation Board of Engineering Education
Council of Engineers Thailand

Accreditation Report

For

< Program Name >

< Educational Institution Name >

< Campus Location >

Prepared by

< Name of Program Evaluator Team Leader >

Signature

< Name of Program Evaluator >

Signature

< Name of Program Evaluator >

Signature

< Name of Designated TABEE Subcommittee >

Signature

< Date >

ACCREDITATION STATEMENT

Program Evaluating Team of Thailand Accreditation Board of Engineering Education (TABEE) has evaluated the *<Program Name >* program at *<Educational Institution Name>* *<Campus Location>*, and recommends accreditation result as following. *<Choose one of the following recommendations>*

- *Full accreditation for accreditation cycle of 6 years.*
- *Accreditation with requirements for a period not exceeding 3 years. Self- assessment report on program improvement is required for program monitoring.*
- *Provisional accreditation (For the new program curriculum which does not have program graduate.). The provisional accredited program must submit program self- evaluation report after completing 2 classes of program graduation.)*
- *Defer accreditation.*
- *Decline accreditation or revoke accreditation.*

In addition, accreditation result and requirements are described in accreditation result table as following. *<choose applicable accreditation result table below and complete the table appropriately.>*

Accreditation Result Table	
Accreditation Status	Full accreditation
Period	6 years
Requirements	None
Findings	<i><All accreditation criteria met, may have suggestions></i>
Program Reporting Obligations	<i><Interim report(after 3 years) on improvement and significant development based on accreditation suggestions.></i>
TABEE Follow-Up Review	<i><EAC-TABEE appoints reviewer to read interim report>.</i>
Expected Outcome Of Follow-Up Review	<i><No change to accreditation status, unless there are the major program changes in program objectives and program outcomes.></i>

Accreditation Result Table	
Accreditation Status	Accreditation with requirements
Period	<i><Not more than 3 years></i> <i><(1-3 years depending on time requirement for improvement to be addressed.)></i>
Requirements	<i><1. Last program evaluating team or 1 selected evaluator reviews Self-Evaluating Report and supporting documents showing requirements have been met.</i> <i>2. Report review may include,</i> <i>1) Program visit and/or,</i> <i>2) Review Self-Evaluating Report for program accredited with requirements to evaluate that requirements have been met and /or,</i>

	<i>3) Program executive meeting for demonstration of program improvement on the requirements. ></i>
Findings	<i><One or more accreditation criteria are found weakness, need for improvement are suggested..></i>
Program Reporting Obligations	<i><Self-Evaluating Report for program accredited with requirements and supporting documents demonstrating requirements have been met..></i>
TABEE Follow-Up Review	<i><Program evaluating team reviews Self-Evaluating Report according to requirements and report to EAC and next to TABEE for approve of accreditation result.></i>
Expected Outcome Of Follow-Up Review	<i><1. Upon completing requirements, TABEE may approve full accreditation status to be 6 years from previous full program evaluation. 2. If requirements not met, TABEE may consider continuing accreditation with requirements, or defer accreditation, or else decline accreditation or revoke accreditation.></i>

Accreditation Result Table	
Accreditation Status	Provisional accreditation
Period	<i><Not more than 3 years></i>
Requirements	N/A
Findings	<i><1. New curriculum offered not less than 3 years and do not have program graduates 2. Development of the program outcomes is undertaken and it is likely that program can satisfy accreditation requirements by the time student graduates. 3. Evaluator team may have suggestions for improvement.></i>
Program Reporting Obligations	N/A
TABEE Follow-Up Review	N/A
Expected Outcome Of Follow-Up Review	Program prepares self-evaluation report and apply for accreditation upon completing 2 graduation classes

Accreditation Result Table	
Accreditation Status	Defer accreditation
Period	1 year
Requirements	N/A
Findings	<i><1. One or more accreditation criteria are found weakness, need for improvement are suggested. 2. Do not have assessment on program outcomes, do not have or cannot confirm program outcomes (graduate attributes) on course portfolio or the quality of document and assessment on program outcomes are not up to minimum requirements for accreditation at that time but</i>

Accreditation Result Table	
	<i>the educational program still shows potential to improve its task to bring the quality of document and assessment on program outcomes up to minimum requirements for accreditation in a short period of time.></i>
Program Reporting Obligations	<i><Revise Self-Evaluation Report and supporting documents and improve on weaknesses and deficiencies.></i>
TABEE Follow-Up Review	<i><Same program evaluator team carries out Self-Evaluating Report and re- program visit.></i>
Expected Outcome Of Follow-Up Review	<i><TABEE may consider either decline accreditation or revoke accreditation or award accreditation with requirements.></i>

Accreditation Result Table	
Accreditation Status	Decline accreditation or revoke accreditation
Period	Requires at least 2 years for improvement. Need re-application for accreditation and submission of self-evaluation report
Requirements	N/A
Findings	<i><1. Program does not have assessment on program outcomes, do not have or cannot confirm program outcomes (graduate attributes) on course portfolio. 2. Program outcomes do not match accreditation criteria. 3. Program outcomes assessments and course portfolio are not adequately recorded for the program evaluating team to consider completion of the accreditation review accordingly to accreditation schedule and program evaluation team agrees that the educational program could not correct the weaknesses or deficiencies within the short period of time. 4. Program cannot improve on weaknesses or deficiencies after last defer accreditation.></i>
Program Reporting Obligations	N/A
TABEE Follow-Up Review	N/A
Expected Outcome Of Follow-Up Review	N/A

The recommendation of the program evaluating team is based on reviewing of educational program Self-Evaluation Report, support document, and evidence collected during the program visit, including observation obtained the program visits.

The reasons for making the above recommendation are based primarily on the following observations: *<Insert reasons if defer accreditation or decline accreditation is chosen>*

EXECUTIVE SUMMARY

During the period *<starting date to report date >*, a program evaluating team appointed by Thailand Accreditation Board for Engineering Education, The Council of Engineers Thailand, has conducted a program evaluation for accreditation of *< Program Name>* Program at *<Educational Institution Name> <Campus Location>* in accordance with TABEE prescribed accreditation criteria.

<Brief overview of educational program, including program general information, program history, and program constituents >

The review activities of the program evaluator team involved *<describe team activities, such as review of documentation, meetings program executives/ coordinator who provided program details and documents, and observations of program visits; include a statement explaining how the program evaluating team assured coverage of all aspects of the program visit, as well as all aspects accreditation criteria.>*

The report of the program evaluator team presents *< summarize the items covered in the report, which will probably include a description of the TABEE accreditation criteria, an overview of the program visits that were observed, an assessment on program outcomes, findings, weaknesses, concerns, observations, and actions or comments for program improvement, or any other issues that the program evaluating team believes should be highlighted.>*

The program evaluator team concludes that *<include, actions or comments for program improvement, and accreditation statement indicating recommendation for accreditation result to the educational program.>*

ACKNOWLEDGEMENTS

<Specify names and roles of individuals who facilitated the program evaluation >

TABLE OF CONTENTS

	Page
ACCREDITATION STATEMENT	i
EXECUTIVE SUMMARY	ii
ACKNOWLEDGEMENTS	iii
1. OVERVIEW OF EDUCATIONAL PROGRAM	
1.1 Program General Information	
1.2 Accreditation History	
1.3 Program Constituents	
2. PROGRAM EVALUATION	
2.1 Evaluator Team	
2.2 Designated Subcommittee Member for Coordinating Program Visit	
2.3 Evaluation Activities	
3. PROGRAM'S SUPPORT DOCUMENTS	
4. ASSESSMENT	
4.1 Criterion 1 Students	
4.2 Criterion 2 Program Educational Objective	
4.3 Criterion 3 Program Outcomes	
4.4 Criterion 4 Continuous Improvement	
4.5 Criterion 5 Curriculum	
4.6 Criterion 6 Faculty	
4.7 Criterion 7 Facilities	
4.8 Criterion 8 Institutional Support	
5. ACCREDITATION DECISION	
6. CONCLUSION	
APPENDIX	
Checklist for Program Evaluation	
Request Form for Program Additional Clarification and Additional Document	

1. OVERVIEW OF EDUCATIONAL PROGRAM

<Briefly describe education program to be accredited by TABEE, program general information and background are described in sub-headings>

1.1 Program General Information

<Briefly describe program general information and background that are explained in program self-evaluation report either in tabulated information or in short paragraphs.>

<background information about the educational institution, including location, type (publicly or privately funded, undergraduate only, research, etc.), when established, overall student enrolment numbers, programs / courses offered, financial situation (e.g., research funding from external sources), organizational structure, etc.>

<background information about the academic unit delivering the engineering program, including range of engineering disciplines covered by programs / courses, overall student enrolment numbers, annual number of degrees awarded, financial situation (e.g., research funding from external sources), organizational structure, etc.>

1.2 Accreditation History

<List dates and program accreditation activities, including weaknesses, concerns, observations, and actions or comments for program improvement, of which shall be monitored during the next accreditation review.>

Date	Accreditation Activities

1.3 Program Constituents

<List activities, requirements, and comments of program constituents who benefit from the program management >

2. PROGRAM EVALUATION

<Description of designated TABEE subcommittee member for coordinating program visit, program evaluator team and activities as they are provided in sub-headings. Description probably includes review of documentation, meetings program executives/ coordinator who provided program details and documents, and observations of program visits; include a statement explaining how the program evaluation team assured coverage of all aspects of the program visit, as well as all aspects accreditation criteria. >

2.1 Evaluation Team

<Provide Information about composition, qualifications, training, how evaluating team members are selected / assigned>

No.	Name	Position	Professional Background/organisation
1		Team Leader	
2		Team Member	
3		Team Member	

2.2 Designated Subcommittee Member for Coordinating Program Visit

<Name of designated TABEE subcommittee member for coordinating program visit, role and activities>

2.3 Evaluation Activities

<List evaluation activities such as review of document, meeting, meeting with executives/program coordinator, preparation for program visit, observations of program visit, program visit, and other related activities.>

No.	Date	Activities

3. PROGRAM'S SUPPORT DOCUMENTS

<List program documents and support documents as they are used or referred to within the report and during the program evaluation>

No.	Document/ references

4. ASSESSMENT

4.1 Criterion 1 Students

< Quality and professional competence of program graduates are essential components of program outcomes evaluation.

An educational institution seeking for accreditation is required to have process for assessment of student learning outcomes with adequate student advisory on activities towards his/her profession career development, as well as counseling on student's wellbeing. The program must have formative and summative assessments and program monitoring throughout the education period to ensure that the program students have attained both quality and attributes set forth in the curriculum objectives.

Rule and Procedure for Accreditation of Engineering Education (3rd Revision)
Document Number: 01/2023
Revision Dated: 2 Nov 2023

Since quality and readiness of students entry to program are essential components leading to attainment of program outcomes, an educational institution seeking for accreditation must have program control procedures and admission statement for selecting student enrollment or admission of student to the program, a procedure for improving student knowledge base in case of necessity, the transfer of educational credits from other institutes to the program, and work procedures for program teaching and learning to ensure that the students are able to graduate from the program with the quality and attributes as prescribed by the program.>

<List findings, weaknesses, concerns, observations, and actions or comments for program improvement, or any other issues that the program evaluation team believes should be highlighted.>

	Description
Findings	
Deficiencies	
Weaknesses	
Concerns	
Observations	
Action or comments for improvement	

4.2 Criterion 2 Program Educational Objective

< An educational program seeking for accreditation of engineering education must have a program statement describing the program objectives, of which indicates that graduate of the program should attain expected program outcomes for engineering professional practice in the program discipline.

An educational program seeking for accreditation of engineering program must have the following components;

Curriculum objectives that have been published and distributed. The curriculum objectives and contents must be corresponding to institutional mission and complying with TABEE criteria. Process to establish the curriculum objectives which are corresponding to result of assessment and periodical review of the curriculum. The curriculum objectives set forth by the program should serve societal demand for engineering profession career development from all constituents beneficiary of program outcomes.

Curriculum, program teaching and learning, and program management that serve to achieve the set forth curriculum objectives and the program outcomes.

Program outcomes assessment and evaluation process that have been used for reviewing and improvement of curriculum for program students to benefit from quality education.>

<List findings, weaknesses, concerns, observations, and actions or comments for program improvement, or any other issues that the program evaluation team believes should be highlighted.>

	Description
Findings	
Deficiencies	
Weaknesses	
Concerns	
Observations	
Action or comments for improvement	

4.3 Criterion 3 Program Outcomes

< This program outcomes used as accreditation criteria is a statement indicating that the program graduates are expected to attain knowledge profile, professional skills and behavioral attributes as they are required in engineering field of professional practice.

The educational institution must submit evidence to TABEE; showing alignment between curriculum objectives and program outcomes.

Program outcomes as they are indicated by attributes of program graduates are as following;

1. Knowledge of Mathematics, Science and Engineering

Ability to apply knowledge of mathematics, natural science, computing, engineering fundamentals and a specific engineering to conceptualize the engineering models, definitions, and/or to respectively apply methodologies, processes, and/or engineering systems in the work place. (according to knowledge profiles TK1 to TK4)

2. Engineering Problems Analysis

Ability to identify, formulate, research literature review, solve, and analyze complex engineering problems reaching substantiated conclusions using principles of mathematics, natural sciences and engineering sciences with holistic considerations for sustainable development. (according to knowledge profiles TK1 to TK4)

3. Design and Development Solutions for Engineering Problems

Ability to design and find solutions for complex engineering problems and design systems, components or processes that meet identified needs with appropriate consideration for society, cultural, public health and safety, professional code of practices, and sustainable development; such as, whole-life cost, net zero carbon, as well as environmental considerations. (according to knowledge profiles TK5)

4. Investigation

Ability to conduct investigations, diagnosis, and evaluation of engineering problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions. (according to knowledge profiles TK8)

5. Modern Tool Usage

Ability to create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering problems, with an understanding of the limitations. (according to knowledge profiles TK2 and TK6)

6. Individual and Team Work

Function effectively as an individual, and as a member or leader in diverse and inclusive teams, and in multi-disciplinary, as well as in various settings. (according to knowledge profiles TK9)

7. Communication

Communicate effectively and inclusively in Thai and English languages with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

8. The Engineer and The World

Understand and responsible for engineering professional practice to society, economy, environmental contexts, sustainable development, and legal framework including capability to evaluate the impact of professional engineering work in the solution of engineering problems to: society, environment, and sustainable development. (according to knowledge profiles TK1, TK5 and TK7)

9. Ethics

Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice and adhere to relevant to national and international laws. Demonstrate and understanding of the need for diversity and inclusion.(according to knowledge profiles TK9)

10. Project Management and Finance

Demonstrate knowledge and understanding of the principles of economic, and engineering management under consideration of risk and uncertainties.

11. Lifelong Learning

Recognize the need for, and have the preparation and ability to engage in; independent and lifelong learning, adaptability to new and emerging technologies, and critical thinking in the context of technological change. (according to knowledge profiles TK8).>

<List findings, weaknesses, concerns, observations, and actions or comments for program improvement, or any other issues that the program evaluation team believes should be highlighted.>

	Description
Findings	
Deficiencies	
Weaknesses	
Concerns	
Observations	
Action or comments for improvement	

4.4 Criterion 4 Continuous Improvement

<The program must regularly use appropriate, documented processes for monitoring, assessing and evaluating program outcomes that students and graduates of the program are attained.

The results of these evaluations must be systematically utilized as input for the continuous improvement of the program.>

<List findings, weaknesses, concerns, observations, and actions or comments for program improvement, or any other issues that the program evaluation team believes should be highlighted.>

	Description
Findings	
Deficiencies	
Weaknesses	
Concerns	
Observations	
Action or comments for improvement	

4.5 Criterion 5 Curriculum

< The program curriculum must specify program knowledge profiles and contents appropriately and adequately in quantity and quality to serve program educational objectives and required program outcomes for each field of professional practice.

The program curriculum structure must include following areas of knowledge contents:

- 4) College level mathematics and basics sciences (including experimental experiences) appropriately to the program discipline, with combined educational work load of not less than 30 credits in semester system or equivalent to educational load of one academic year.
- 5) Basic engineering and specific engineering topics (including experimental experiences) appropriately to the program discipline to provide a bridge between mathematics and basic sciences, and basic engineering for student to appropriately use in engineering design and solving of complex engineering problems according to engineering work requirements, with combined educational work load of not less than 45 credits in semester system or equivalent to educational load of one and a half academic years.
- 6) General education that complements the technical contents of the curriculum and is consistent with program educational objectives and institutional objectives.

The program curriculum must provide engineering practice and engineering projects that allow students to have engineering design experiences and solving complex engineering in the final year of education which allow students to use the knowledge and skills acquired in earlier course works and incorporating appropriate engineering standards and multiple realistic constraints..>

<List findings, weaknesses, concerns, observations, and actions or comments for program improvement, or any other issues that the program evaluation team believes should be highlighted.>

	Description
Findings	
Deficiencies	
Weaknesses	
Concerns	
Observations	
Action or comments for improvement	

4.6 Criterion 6 Faculty

< Educational institute must provide adequate number of faculty. The faculty must have the educational qualification with professional competence relevance to the program discipline. The faculty must also provide adequate student advisory relating to students' professional career development and other activities related with professional society and industry.

The program teaching staff must demonstrate, both academic and professional competence, regarding student advisory and student career development including teaching and student evaluation for the continuous quality improvement of teaching to achieve learning outcomes as prescribed in curriculum objectives.>

<List findings, weaknesses, concerns, observations, and actions or comments for program improvement, or any other issues that the program evaluation team believes should be highlighted.>

	Description
Findings	
Deficiencies	
Weaknesses	
Concerns	
Observations	
Action or comments for improvement	

4.7 Criterion 7 Facilities

< The educational program must provide continuously support to the program with adequate facilities, including classrooms, laboratories, library, and other supporting infrastructure to accommodate academic environment, academic development, professional activities of student, as well as quality education. The program must continuously stimulate student learning opportunities by provision of modern tools and equipment, information technology and communication network for student and academic staff to serve requirements for academic development and extra-curriculum activities in accordance with curriculum educational objectives.>

<List findings, weaknesses, concerns, observations, and actions or comments for program improvement, or any other issues that the program evaluation team believes should be highlighted.>

	Description
Findings	
Deficiencies	

Weaknesses	
Concerns	
Observations	
Action or comments for improvement	

4.8 Criterion 8 Institutional Support

< Institutional support and program leadership must be adequate to ensure the quality and continuity of the program. Institutional financial support provided to the program must be adequate to meet program needs. Resources available to the program must be sufficient to promote, retain, and provide for the continued professional development of a qualified faculty. Resources must be sufficient to acquire, maintain, and operate infrastructures, facilities and equipment appropriate for the program, so that program outcomes can be attained. In addition, the educational institution must provide adequate supporting staff and educational services for program teaching and learning and program management.>

<List findings, weaknesses, concerns, observations, and actions or comments for program improvement, or any other issues that the program evaluation team believes should be highlighted.>

	Description
Findings	
Deficiencies	
Weaknesses	
Concerns	
Observations	
Action or comments for improvement	

5. ACCREDITATION DECISION

<Explanation of decision-making procedures and policies, including allowable out-comes, description of the conduct of the meeting, including processes to avoid conflicts of interest, any other issues that the program evaluation team believes should be highlighted.>

6. CONCLUSION

<include, actions or comments for program improvement, and accreditation statement indicating recommendation for accreditation result to the educational program.>

APPENDIX

<Insert documents cited / reviewed as part of program evaluation activities, such as checklist for program evaluation and request form for program additional clarification and additional document.>

Attachment 5

Description of Knowledge Contents for Basic Engineering and Specific Engineering

Scope of Engineering Works Relating to Regulated Engineer Disciplines

No.	Engineering Discipline	Descriptions
1	Civil Engineering	The regulated civil engineering works relate to consulting, project planning, design and computation, construction supervision, investigation verification, testing, operate and maintenance supervision, according to drawing, plan, and code of engineering professional practices, of any building, structure, foundation and transportation, and public infrastructure such as, public building, warehouse, silo, tower or column structure, bridge structure and foundation, ship dock, prefabrication of concrete component and structure, foundation and piling works, infrastructure building, highway and transportation, airport runway, railway, dam, dike, tunnel, fluid contain structure water drainage, irrigation system, stadium and etc.
2	Electrical Engineering	The regulated electrical engineering consists of 2 sub-disciplines; electrical power, and electrical telecommunication. The regulated electrical engineering works relate to consulting, project planning, design and computation, production and installation supervision, investigation, verification, testing, operate and maintenance supervision, according to drawing, plan, and code of engineering professional practices of electrical power engineering works, such as, such as electrical generating system, electrical power transmission, electrical system or devices, electrical signaling system, and lightning protection; as well as telecommunication engineering works such as telecommunication network with receiving, transmission, and broadcasting station, electromagnetic wave propagation system, and receiving, transmission, separating and multiplexing of signaling system.
3	Mechanical Engineering	The regulated mechanical engineering works relate to consulting, project planning, design and computation, production and installation supervision, investigation, verification, testing, operate and maintenance supervision, according to drawing, plan, and code of engineering professional practices of machinery and equipment, boiler, pressure vessel, air conditioning and refrigeration system, thermal power plant and system, fluid system under pressure or vacuum in pipe or vessel, energy management and fire system and fire prevention system.
4	Industrial Engineering	The regulated industrial engineering works relate to consulting, project planning, design and computation, production and installation supervision, investigation, verification, testing, operate and maintenance supervision, according to drawing, plan, and code of engineering professional practices of factory production and manufacturing system such as Manufacturing process using chemical reaction, flammable substance, dangerous substance, fractional distillation, or operation in vessel of pressure higher than atmospheric pressure in factory; making of products; ventilation in manufacturing plant; factory; assembly lines; metal smelting; quality assurance; plant lay out; safety management; production and product logistics; warehouse and inventory control; fire protection and fire prevention in manufacturing plant.
5	Mining Engineering	The regulated mining engineering consists of 2 sub-disciplines; mining engineering, and metallurgical engineering. The regulated mining

Rule and Procedure for Accreditation of Engineering Education (3rd Revision)

Document Number: 01/2023

Revision Dated: 2 Nov 2023

No.	Engineering Discipline	Descriptions
		<p>engineering works relate to consulting, project planning, design and computation, supervision on development and production of mineral ore, mine investigation, verification, testing, Mine operate and maintenance supervision, according to drawing, plan, and code of engineering professional practices of mining engineering works, such as surface mining, quarrying, underground mining, mineral dredging, tunneling, shaft sinking and underground opening in rock formation, use of explosive in any engineering work, mineral dressing, separating and recycling of waste materials, estimation and valuation of mineral reserve, study of pit slope stability, land reclamation, and post-mining land restoration; as well as metallurgical engineering works such as separation of waste material, mineral dressing, iron smelting, mineral smelting or extraction of alloys and metal, metal melting, metal powder casting and molding, forming, welding, metal properties treatment, surface coating and heat treatment, failure analysis, and metal corrosion prevention.</p>
6	Chemical Engineering	<p>The regulated chemical engineering works relate to consulting, project planning, design and computation, supervision on production using chemical process, production of chemical products, process investigation, verification, testing, chemical plant operation and maintenance supervision, according to drawing, plan, and code of engineering professional practices of chemical engineering works such as manufacturing of products using chemical reaction, physical chemistry, biochemistry or electro-chemistry; manufacturing of products using physical properties alteration or phase change of raw materials; manufacturing process using fine powder, pellet, or dangerous chemical substance; manufacturing process using chemical reaction with pressure; waste treatment process using chemical substance, chemical catalysis, biochemical catalysis; handling system of chemical, toxic substances, fine powder or grains which may cause explosion or electrostatics; manufacturing process using distillation tower, adsorption tower, absorption tower, extraction device, precipitation tank, or recrystallization device, membrane separation, ionic exchange tower, filter press, filter bag, electrostatic dust collector; evaporator or production kiln, and fire system of chemical factory.</p>
7	Environmental Engineering	<p>The regulated environmental engineering works relate to consulting, project planning, design and computation, supervision on environmental impact assessment and industrial waste management environmental impact investigation, verification, testing, waste treatment operation and maintenance supervision, according to drawing, plan, and code of engineering professional practices of environmental engineering works such as tap water system, clean water system, waste water system, recycling of waste water, water resource development with environmental impact, air pollution control system, noise pollution control, land restoration system, solid waste system, industrial waste treatment, radiation contamination, and fire prevention system.</p>

Specific Knowledge Relating to Regulated Engineer Disciplines

No.	Engineering Discipline	Descriptions
1	Civil Engineering	Civil engineering may include engineers with educational background of civil engineering and/or related to civil engineering discipline such as, structural engineering, transport engineering, highway engineering, construction engineering, geo-technical engineering, water resources engineering, irrigation engineering, coastal engineering, and survey engineering.
2	Electrical Engineering	Electrical engineering may include engineers with educational background of electrical engineering and/or related to electrical engineering discipline such as; power electrical engineering, electronics engineering, telecommunication engineering, information engineering, power engineering, rail-signaling system engineering, and electrical measurement and control.
3	Mechanical Engineering	Mechanical engineering may include engineers with educational background of mechanical engineering and/or related to mechanical engineering discipline such as; ship building engineering, naval architecture, marine engineering, ocean engineering, agricultural engineering, farm machinery, food engineering, aeronautical engineering, ventilation engineering, refrigeration engineering, automotive engineering, mechatronics engineering, robotics engineering, energy engineering, and energy conservation engineering.
4	Industrial Engineering	Industrial engineering may include engineers with educational background of industrial engineering and/or related to industrial engineering discipline such as; robotics and automation engineering, logistic engineering, manufacturing engineering, industrial safety engineering, industrial management engineering, and industrial hazardous engineering.
5	Mining Engineering	Mining engineering may include engineers with educational background of mining engineering and/or related to mining engineering discipline such as; mineral engineering, metallurgical engineering, geo-resources engineering, material engineering, geo-technical engineering, geological engineering, rock mechanics engineering, excavation engineering, and underground excavation.
6	Chemical Engineering	Chemical engineering may include engineers with educational background of chemical engineering and/or related to chemical engineering discipline such as; petrochemical engineering, and chemical process engineering.
7	Environmental Engineering	Environmental engineering may include engineers with educational background of environmental engineering and/or related to environmental engineering discipline such as; sanitary engineering,

No.	Engineering Discipline	Descriptions
		ecological engineering and pollution control, water supply engineering, and waste management engineering.

**Scope of Work and Professional Competency for Registered Professional Engineer
Disciplines**

No.	Engineering Discipline	Descriptions
1	Agricultural Engineering	<p>Agricultural engineering integrates knowledge of of basic sciences, agricultural sciences, and engineering systems of various fields such as mechanical, electrical, computer, Information system, GIS GPS, and database system, to facilitate agricultural farming.</p> <p>Agricultural engineering includes: applying knowledge and technology for agricultural land management, soil and water management, irrigation, as well as proper and adequate water supply for agriculture; supervising and design of machine equipment for agricultural use; properly and strictly use of agro-chemicals in accordance with regulations for the safety of operators and public; and managing harvesting machinery to reduce losses, as well as to achieve maximum productivity.</p> <p>Agricultural engineering also includes: arranging for transformation and storage of agricultural products in a correct, appropriate, and hygienic manner to readily use for other agricultural production processes.</p> <p>Agricultural engineering is also responsible for treating agricultural waste; including solids, liquids, and gas, which are used to make biomass fuel, biogas fermentation and fermentation based on data management in the following areas such as meteorological information, weather, this includes provision of market information for farmers to make the most beneficial agricultural choices.</p>
2	Computer Engineering	<p>Computer Engineering involves; applying sciences and technology to design and build a computer for efficiency, software, and communication including consulting, project management, design, production control and production, inspection, operation, and maintenance of software and hardware systems, and other related digital technologies, computer systems, and other systems that use a computer to process control and management including other systems that use computer systems. Others include:</p> <ol style="list-style-type: none"> 1. Circuits and Electronics 2. Algorithms 3. Computer Architecture and Organization 4. Digital Design 5. Embedded Systems 6. Computer Networks 7. Computer Engineering Professionalism 8. Cyber Security 9. Emerging Technologies

No.	Engineering Discipline	Descriptions
		10. Signal Processing 11. Systems and Project Engineering 12. Systems Resource Management 13. Software Design
3	Coastal Engineering	Coastal engineering involves engineering that is the link between the land and the sea; facilitating other activities, such as offshore oil drilling, freight vessels docking, subsea pipelines or cables, coastal protection structures, etc., which require various engineering applications to enable development and living in harmony with nature both environment and sea. Coastal engineering work involves; construction of buildings or structure on shore and offshore; work in engineering construction a transport system according to the high and low of the water level; power generation system; availability of electric power for propulsion; emergency power backup control communication system and living facility, etc. Coastal engineering must consider of life and asset safety standards; design standards when it is expected to come from the earthquake, storms and tsunami waves, environmental and agricultural standards related to operational safety at sea, emergency preparation etc.
4	Bio-medical Engineering	Bio-medical engineering is a multi-disciplinary program that combines knowledge of basic sciences, medical sciences, medical information technology, and engineering. Bio-medical engineering develops software for medical supplies or standardized medical devices that can be used in real life; including the study of new technologies that are clean for use in medical diagnostics, medical assistance, facilitation, and restoration, including replacement of human body parts, as well as production control, commercial administration, and managing the use of medical materials or technology with efficiency and effectiveness.
5	Naval Engineering	Naval engineering relates to shipbuilding, ship modification and ship maintenance which involves in project planning, design and supervision of ship-building, inspection, and maintenance to ensure safety, quality and environmental-friendly of ship vessel. The naval engineering largely involves ship's hull structure, propulsion system, electrical system, navigation system, detection system, communication system, shipbuilding process, ship testing, on-ship operation, safety standard for ship navigation, safety standard for on-ship operation, and marine environmental standard.
6	Building Maintenance Engineering	Building maintenance engineering involves engineering work in the building which requires various knowledges and technologies relating to the building operations and functions such as building structural works, plumbing and wastewater system, water pumping, air-conditioning, elevator, ventilation system, fire alarm and fire prevention system,

No.	Engineering Discipline	Descriptions
		building electrical distribution system, building lighting system, communication system, building safety and control system, building audio communication system, building automation system, energy management system, building inspection, system testing, maintenance system, building internal air quality control, emergency escape and evacuation, building emergency response, etc. Operating and maintenance of building works and system require preparation of trained personnel in building engineering to achieve safety and efficiency of engineering works required by regulated building standards which mean to protect life and properties of building residents and which may affect severe impact to the environment.
7	Fire Protection Engineering	Fire protection engineering involves fire prevention and protection of the buildings and structures, such as large-scale building, public building, industrial factory, hospital, and auditorium. When fire outbreak, it may cause loss of life and properties, disruption of business, and severe impact to environment, it is therefore fire protection engineering requires knowledge and professional competency relating to; eruption and spreading of fire, fire smoke distribution, and fire simulation to control and provide safe and efficient case for fire protection system, design and calculation for fire protection and fire escape, human behavior under fire emergency, design of fire escape route, fire risk assessment, fire cause investigation, building segmentation, fire structure test and fire refractory test, fire emergency response procedure, fire safety management in building or factory, fire protection system inspection and maintenance, fire protection system and device, law and fire protection standards and, etc.
8	Petroleum Engineering	Petroleum engineering involves an applying of basic mathematics, physics, chemistry and engineering sciences for exploration and evaluation of petroleum resources development, petroleum production, and transportation, of which relates to subsurface petroleum exploration and production for further usage. Petroleum engineer is directly responsible for exploration, evaluation of petroleum fields, development, drilling well planning, and petroleum field development for production of crude and natural gas including petroleum waste management. Generally, petroleum engineering is divided into 3 sub-disciplines namely: reservoir engineering, drilling engineering, and production engineering. That is when petroleum reservoir is discovered, reservoir engineer shall examine and evaluate the petroleum reservoir performance which includes conditional consideration for optimum petroleum production for maximizing petroleum recovery and return on investment under safety and environmental restrictions. Drilling engineer is responsible for design of well configuration and drilling plan to save cost and economic return, gathering necessary information for analysis and evaluation of petroleum reservoir performance, or to drill production

No.	Engineering Discipline	Descriptions
		wells according to production design under consideration of safety, environmental impacts, and return on investment. Once the well is completed, the production engineer is taking over responsibility manage the production wells to the produce petroleum at highest efficiency including monitoring and analysis for optimum each well production performance according to the contracted delivery rate, and consideration of appropriated production process and technology for enhancing efficiency and extending life of well production period and production equipment.
9	Energy Engineering	Energy engineering relates to various forms of energy readily use for engineering works in commercial buildings, industries, renewable energy, and new emerging type of energy including energy technology involving energy transformation, energy management, safe and efficient of energy consumption, and environmental standard for energy related operations.
10	Mechatronics Engineering	Mechatronics engineering is multi-disciplines which combines knowledge of mechanical engineering, electronics engineering, computer engineering, and system engineering in mechatronics. Mechatronics engineering includes design of computer controlled electromechanical system or design of synchronized of mechanical system in the modern mechanical equipment using computer control. Mechatronics engineering emphasis on design, production, and maintenance of mechanical-electronics controlled machinery resulting automatic and high precision performance of mechanical system. Mechatronics system consists of system or plant, actuators, sensors, controller, and intelligent system. Therefore, mechatronics engineer must have combined knowledge on the mentioned mechatronic system and standards on industrial product specification, safety standard on industrial operation, and operational, efficiency and management on new modern equipment.
11	Automotive engineering	Automotive engineering involves engineering of land transportation vehicles such as car, truck, bus, and motorcycles, of which compose of drive engine system from internal combustion engine or electrical motor or combining power from engine and electrical motor, power transmission system transmitted from gasoline or electrical power from charged battery storage, electrical system and embedded controlling system, chassis, aero-dynamic of vehicle body, suspension and vibration control system, wheel and tire, steering system, brake system, automotive and parts manufacturing process, safety standard, driving comfort standard, vehicle testing standard; threshold limit of vehicle performance, environmental impacts, etc.
12	Rail Engineering	Rail engineering relates to electrical rial transport system or public rail transportation system or fixed guideway system such as railway system, mass rapid transit system, monorail system, light rail system, tramway system, funicular system, and automated guideway transit. Rail engineering involves several aspects of engineering work; i.e. surveying,

No.	Engineering Discipline	Descriptions
		civil work, rail switching, mechanical works, rolling stock, electrical system, communication and signaling system, control and data acquisition, environments, project engineering and engineering technology.
13	Information Engineering	Information engineering relates to consulting, project planning, design and calculation, construction or production control, investigation, problem solving, and supervision of information system which includes application of all forms of information technology in data processing, data collecting and storage, creating and information communication through telecommunication network using electronic devices or computer hardware using the programme or set of instructions for computer to work with software interact effectively, systematically and safely according to set forth target.
14	Survey Engineering	Survey engineering relates to determination of size and shape of object, earth surface area or earth size using mathematics, measurement, photographic surveying, remote sensing, or other techniques for positioning, and establishing reference location, control pin, marking pin, readjusting marker location in survey project and mapping. Survey engineering work leads to several aspect of engineering and development such as water resources management and design of transportation system and infrastructure, design of agriculture area, and natural catastrophe prevention. Survey engineering work are categorized as; 1) Surveying, 2) GNSS (Global Navigation Satellite System): GPS, Glonass, Galileo, Compass, 3) Remote sensing, 4) Photogrammetry, 5) Cartography, 6) GIS, 7) Geodesy, 8) Cadastral Survey, 9) Engineering Survey, and 10) Hydrographic Survey.
15	Water Resources Engineering	Water Resources Engineering relates to manage of water, dam, and hydraulic structures starting from collecting rainfall statistics, analysis for amount of water quantity, numbers of water recourses, water storage, use of water resources such as water consumption, agriculture and irrigation, industries, hydropower generation, environmental improvement, ecological system preservation, water drainage, flood control and mitigation, erosion, and sedimentation, etc. Therefore, water resources engineering works are closely related with various engineering works such as civil engineering works, environmental engineering works geotechnical/foundation works, surveying works for land management, electro-mechanical energy conversion, appropriate energy consumption, measurement, and control of water quantity, systematically collecting statistical data of rainfall, runoff water, underground water, and environments. Water resources engineer must consider safety standards and regulations, environmental impacts, and socioeconomic. Water

No.	Engineering Discipline	Descriptions
		resources engineering is split into sub-discipline: water resources planning, and hydraulics.
16	Aeronautical Engineering	Aeronautical engineering relates to aircrafts such as airplane, helicopter, airship, unmanned arial vehicle, etc. of which are consisted of aircraft power system, aircraft structure, materials, aircraft system, regulations and requirements of international aviation control, safety standards for aircraft operations and maintenance requirements.
17	Food Engineering	Food engineering relates to food industry in consulting, project planning, design and calculations, control and supervision, installation, maintenance, and inspection of food production line to meet standards, efficiency, safety, and food hygiene. Food engineering works starting from food production building, food processing and machinery, and production support system according to requirements on safety and operational standards.

Required Specific Knowledge for Registered Professional Engineer Disciplines

No.	Engineering Discipline	Required Specific Knowledge
1	Agricultural Engineering	<ol style="list-style-type: none"> 1. Land and Soil Conservation Irrigation and Drainage 2. Animal Production and Aquaculture Engineering 3. Plant Production Engineering (Equipment, tool, and Machinery) 4. Agricultural Processing Engineering 5. Energy and Biomass Engineering 6. Information Technology and Management for Agriculture
2	Computer Engineering	<ol style="list-style-type: none"> 1. Computer hardware 2. Computer software 3. Specific subjects includes <ol style="list-style-type: none"> 1) Circuits and Electronics 2) Algorithms 3) Computer Architecture and Organization 4) Digital Design 5) Embedded Systems 6) Computer Networks 7) Computer Engineering Professionalism 8) Cyber Security 9) Emerging Technologies 10) Signal Processing 11) Systems and Project Engineering 12) Systems Resource Management 13) Software Design
3	Coastal Engineering	<p>Sub-discipline: Offshore Engineering</p> <ol style="list-style-type: none"> 1) Offshore Structure 2) Subsea Structure 3) Subsea Flowline 4) Subsea Cable and Umbilical 5) Offshore Transportation and Installation Aid Equipment 6) Offshore Operation Support <p>Sub-discipline: Nearshore</p> <ol style="list-style-type: none"> 1) Coastal and Estuary Protection 2) Marine and Coastal Structure 3) Sea Reclamation 4) Beach Nourishment 5) Coastal Flooding Prevention 6) Navigational Stability
4	Bio-medical Engineering	<ol style="list-style-type: none"> 1. Academic Research and Development of Bio-medical Engineering 2. Industrial manufacturing and Bio-medical Engineering Products 3. Health Care and Medical Service Industry
5	Naval Engineering	<ol style="list-style-type: none"> 1. Ship Hull and Structure 2. Propulsion System and Ship Machinery 3. Electrical and Control System 4. Safety, Environments System 5. Operations in Shipyard 6. On-Ship Operations

No.	Engineering Discipline	Required Specific Knowledge
6	Building Maintenance Engineering	<ol style="list-style-type: none"> 1. Maintenance of System, System Operation and System Testing 2. Readiness Preparation and Escape 3. Emergency Response 4. Energy and Environmental Management
7	Fire Protection Engineering	<ol style="list-style-type: none"> 1. Building Plan for Fire Protection 2. Fire Escape Route 3. Human Behavior Under Fire Accidents 4. Proactive and Reactive Fire Protection 5. Fire Dynamics 6. Fire Protection Performance 7. Procedure and Methodology for Fire Sensors and Fire Alarm, Fire Accident Report, Building's Fire Emergency Instruction. 8. Smoke Management and Control 9. Safety Management, Prevention, Response, and Communication During Fire Accident and Restoration. 10. Inspection, Testing, and Maintenance of Fire Protection System 11. Fire Risk Assessment
8	Petroleum Engineering	<p>Sub-Discipline: Drilling Engineering</p> <ol style="list-style-type: none"> 1. Pressure Control While Drilling and Well Abandonment 2. Petroleum Well Drilling: Both Vertical Well and Directional Well 3. Use of Petroleum Drilling Mud and Well Bore Hydraulics 4. Drill Cuttings and Lithology Log 5. Casing and Cementing of Oil Well Drilling <p>Sub-discipline: Reservoir Engineering</p> <ol style="list-style-type: none"> 1. Analysis of Petroleum Reservoir Properties 2. Formation Analysis and Well Logging 3. Petroleum Fluid Behavior and Reservoir Drives Analysis 4. Improving Production Efficiency and Evaluation of Petroleum Reservoir 5. Oil and Natural Gas Reserve Estimation <p>Sub-discipline: Production Engineering</p> <ol style="list-style-type: none"> 1. Production Well Completion 2. Fluid Flows and Production Well Logging 3. Artificial Lift 4. Production Well Stimulation 5. Production Well Operations and Maintenances 6. Surface Production System 7. Well Shut-in and Well Abandonment
9	Energy Engineering	<ol style="list-style-type: none"> 1. Energy Engineering for Building Systems 2. Energy Engineering in Industrial Manufacture 3. Engineering Works Relating to Energy Transformation and Storage 4. Energy Technology

No.	Engineering Discipline	Required Specific Knowledge
10	Mechatronics Engineering	<ol style="list-style-type: none"> 1. Project Design 2. Project Control 3. Project Management 4. Feasibility Study on Utilization of Mechatronics Systems 5. Conceptual Design 6. Engineering Design and Planning 7. Production Design 8. Manpower Planning 9. Engineering Design 10. Production Design 11. Design of Dynamic Controlled System 12. Design of Electronic Controlled System 13. System Integration 14. Design of Support System 15. Design of Repair and Maintenance 16. Design of Inline Inspection & Testing 17. Controlling of Production Standard 18. Supplier Control 19. Controlling of System integration 20. Planning for Repair and Maintenance 21. System Improvement 22. Requisition of Equipment Replacement 23. System Quality Testing 24. Requisition of System Replacement 25. Preparation for System Testing 26. Requisition for Material and Device
11	Automotive engineering	<ol style="list-style-type: none"> 1. Automotive Body and Structure – Automotive System Components 2. Prime Mover System 3. Power Transmission System 4. Suspension, Steering, and Brake System 5. Fuel and Fuel Supply System, Lubrication System 6. Vehicle Control System/ Automatic System 7. Electrical System 8. Air Conditioning System 9. Renewable Energy System 10. Production Planning 11. Manufacturing and Parts Assembly 12. Testing and Control 13. Environmental Technology and Recycling 14. Road Traffic – Vehicle Management
12	Rail Engineering	<ol style="list-style-type: none"> 1. Surveying Works 2. Civil Works 3. Rail and Switching

No.	Engineering Discipline	Required Specific Knowledge
		4. Mechanical Works 5. Rolling Stock 6. Electrical Works 7. Communication Works 8. Signaling System 9. Control and Data Collection (SCADA) 10. Environmental Works 11. Project Engineering 12. Engineering Technology
13	Information Engineering	1. Management of Communication Network Efficiency 2. Information Security System Planning 3. Information Program Software Design 4. Telecommunication Network Management 5. Development and Management of Information Data and Data Storage
14	Survey Engineering	1. Surveying and Engineering Surveying 2. GNSS - Global Navigation Satellite System and Geodesy 3. Remote Sensing and Photogrammetry 4. GIS-Geographic Information system and Cartography 5. Cadastral Surveying 6. Hydrographic Surveying
15	Water Resources Engineering	Sub-Discipline: Water Resources Planning 1. Water Administration and Management 2. Drainage and Flood Mitigation 3. Irrigation System 4. Waste Water Collection System 5. Transmission and Distribution System 6. Dam and Hydraulic Structure 7. Hydropower System 8. Groundwater System Sub-discipline: Hydraulics 1. Drainage and Flood Mitigation 2. Irrigation System 3. Waste Water Collection System 4. Transmission and Distribution System 5. Dam and Hydraulic Structure 6. Hydropower System 7. Erosion and Sedimentation
16	Aeronautical Engineering	1. Aero-dynamics 2. Aircraft Structure

No.	Engineering Discipline	Required Specific Knowledge
		3. Aircraft Power System 4. Aircraft System
17	Food Engineering	1. Food Production Building 2. Food Processing and Machinery 3. Production Machinery 4. Production Support System

Attachment 6

The Council of Engineers Regulations

on

Recognition of Degree, Certificate or Diploma in the Regulated Engineering Practice

B.E. 2554 (2011), (2nd Amendment) B.E. 2561 (2018), and 3rd Amendment B.E. 2564 (2021)

(Translation Document)

The Council of Engineers Regulations
on
Recognition of Degree, Certificate or Diploma in the Regulated Engineering Practice
B.E. 2554 (2011), (2nd Amendment) B.E. 2561 (2018), and 3rd Amendment B.E. 2564 (2021)

Whereas, it is appropriate to revise the Council of Engineers Regulations for Recognition of Degree, Certificate, or Diploma in the Regulated Engineering Practice B.E. 2543 (2020).

By virtue of Section 8 (3) and (6) (k) of the Engineers Act B.E. 2542 (1999), which is a law containing certain provisions on restriction of rights and liberties of individuals, Section 29 coupling with Section 43 and Section 45 of the Constitution of the Kingdom of Thailand, by virtue of the provisions of law, the Council of Engineers by resolution of the General Meeting of the Council of Engineers for the year B.E. 2553 (2010), on March 29, B.E. 2553 (2010), and with the approval of the Special President of the Council of Engineers therefore issued regulations. as follows

Article 1. This regulation is called “The Council of Engineers Regulations on Recognition of Degree, Certificate, or Diploma in the Regulated Engineering Practice B.E. 2554 (2011)”.

Article 2. This regulation shall be enacted on the following day of publication date in the Royal Gazette onwards.

Article 3. Revoke the Council of Engineers Regulation on Recognition of Degree, Certificate, or Diploma in the Regulated Engineering Practice B.E. 2543 (2000).

Article 4. In this regulation;

“Educational institution” refers to school, college, institution, university, higher educational agency, or other public or private agency which has function or objective in providing higher education.

“Program” refers to higher educational program which offers degree, certificate, or diploma in the regulated engineering practice including cooperative program in accordance with announcement of Higher Education Commission.

“Semester System” means educational class schedule which divides annual class schedule into two terms in an academic year or according to the Council of Engineers announcement.

“Program faculty” (definition is revoked)

“Program Chair” (definition is revoked)

“Number of faculty for calculated faculty ratio number” (definition is revoked)

“ Recognition of Degree, Certificate, or Diploma in regulated engineering practice⁵” refers to the educational qualification recognition of the degree, certificate, or diploma providing to educational institution upon requisition by which the program has provided program educational objective, body of knowledge, and graduate attributes as they are required in the regulated engineering practice according to criteria, procedures and conditions set forth in this regulation.

Article 5 The Council of Engineers Board shall recognize degree, certificate or diploma in the regulated engineering practice on behalf of the Council of Engineers.

Rule and Procedure for Accreditation of Engineering Education (3rd Revision)

Document Number: 01/2023

Revision Dated: 2 Nov 2023

The recognition of degree, certificate, or diploma in the regulated engineering practice, according to paragraph one, it shall be done for each period not exceeding five years.

Article 6 Any educational institution wishes to request for recognition of a degree, certificate or diploma in the regulated engineering practice is required to submit an application to the Council of Engineers in document format prescribed by the Council of Engineers.

Document described in paragraph one must at least consist of

- (1) Program curriculum of the degree, certificate, or diploma which is requested for the recognition.
- (2) Self-Declaration of the educational program in a format announced by the Council of Engineers.

In case of a new program curriculum, an application must be submitted for recognition of a degree, certificate, or diploma in the regulated engineering practice and be recognized prior to the program student admission.

In case of revised curriculum, an application must be submitted for recognition of a degree, certificate, or diploma in the regulated engineering practice within one year from the date that curriculum is legally approved by the educational institution.

In cases of paragraph three and paragraph four, if requested by the educational institution and the Council of Engineers may consider that it is a case of force majeure or necessity causes that the educational institution cannot submitted the application within the announced timeframe, the Board of Council of Engineers may consider, on case-by-case basis, renouncing.

Article 6/1 Application for recognition of degree, certificate or diploma for an overseas educational institutions, the individual graduate applicant must provide together with the application, an evidence that the overseas degree, certificate or diploma is endorsed by The Office of Civil Service Commission.

In case that the overseas educational institution is not endorsed by The Office of Civil Service Commission, judgment made by the Council of Engineers Board may be applied on case-by-case basis.

Article 7 The Council of Engineers Board shall recognize a degree, certificate, or diploma in the regulated engineering practice to the applicant after considering the recognition is complying to Article 8, and the within curriculum of applicant is complying to Article 9 program chair, program faculty is considered complying to Article 10, and the educational institution is complying to Article 11.

Article 8 The program curriculum requesting recognition of a degree, certificate, or diploma, must be characterized as follows;

- (1) The curriculum must contain educational objectives and body of knowledge as they are required by the Council of Engineers so that the program graduate are competence to appropriately practice in the regulated engineering field. However, in case that the program curriculum requested for recognition is in more than one

- regulated engineering disciplines, the curriculum must contain all bodies of knowledge pertaining to the regulated engineering disciplines
- (2) The Curriculum details and course contents including the case of transfer of course credits and course evaluation, must contain the body of knowledge in the regulated engineering practice announced by the Council of Engineers
 - (3) Curriculum structure must contain the number of credits in each course subjects according to higher education standard and related laws announcement by the Office of Higher Educational Commission, as well as the number of credits in specific engineering subjects, which contains body of knowledge in the requested regulated engineering practice, not less than 30 credits.

Article 9 Students admitted to the program requesting for recognition of a degree, certificate, or diploma, must complete 6th grade of secondary education or equivalent, or complete the higher diploma program.

Paragraph two (is revoked.)

Paragraph three (is revoked.)

Article 10 Qualification and numbers of program chair, program faculty, and teaching faculty, must comply to the laws of the higher education and other related laws.

Article 11 The educational institution must provide class teaching, laboratory study, teaching and learning equipment and facilities, academic information services and resources as they responding to the body of knowledge in the requested regulated engineering practice.

Article 12 The recognized degree, certificate, or diploma equivalent to the degree and the graduate of the program which were recognized by the Engineers Act B.E. 2505 (1962), and the Council of Engineers Regulations on Recognition of Degree, Certificate or Diploma equivalent to the degree in Engineering Practice B.E.2543 (2000) are considered the recognized degree, certificate, or diploma , and graduate of such the program are recognized for degree and educational qualification according to this regulation.

Article 13 In case of not complying to the Council of Engineers Regulation on Recognition of Degree, Certificate, or Diploma, relating to basic sciences subjects, basic engineering subjects, and specific engineering subjects by which the Council of Engineers approves recognition of degree, certificate, or diploma in the regulated engineering practice, the Council of Engineers Board shall consider approve of the recognition on case-by-case basis.

Article 14 The Program that is accredited according to the Council of Engineers Rule on Accreditation of Engineering Education by TABEE Subcommittee of the Council of Engineers is considered recognized by the Council of Engineers Regulation on recognition of degree, certificate, or diploma in the regulated engineering practice for each period of not exceeding than six years.

Published Date January 31, B.E. 2554 (2011)

Tavee Butrasonthorn
President of The Council of Engineers

Footnote:

- (1) “Program¹” This definition is revised by the Council of Engineers Regulations on Recognition of Degrees, Certificates, or Diploma in the Regulated Engineering Practice (2nd amendment) B.E. 2561 (2018).
- (2) “Program faculty” This definition is revoked by the Council of Engineers Regulations on Recognition of Degrees, Certificates, or Diploma in the Regulated Engineering Practice (3rd amendment) B.E. 2564 (2021).
- (3) “Program chair” This definition is revoked by the Council of Engineers Regulations on Recognition of Degrees, Certificates, or Diploma in the Regulated Engineering Practice (3rd amendment) B.E. 2564 (2021).
- (4) “Recognition of Degree, Certificate, or Diploma in regulated engineering practice” This definition is revised by the Council of Engineers Regulations on Recognition of Degrees, Certificates, or Diploma in the Regulated Engineering Practice (3rd amendment) B.E. 2564 (2021).
- (5) “Article 6, paragraph two” is revised by the Council of Engineers Regulations on Recognition of Degrees, Certificates, or Diploma in the Regulated Engineering Practice (3rd amendment) B.E. 2564 (2021).
- (6) “Article 6 paragraph three” is revised by the Council of Engineers Regulations on Recognition of Degrees, Certificates, or Diploma in the Regulated Engineering Practice (2nd amendment) B.E. 2561 (2018).
- (7) “Article 6 paragraph four” is revised by the Council of Engineers Regulations on Recognition of Degrees, Certificates, or Diploma in the Regulated Engineering Practice (2nd amendment) B.E. 2561 (2018).
- (8) “Article 6 paragraph five” is revised by the Council of Engineers Regulations on Recognition of Degrees, Certificates, or Diploma in the Regulated Engineering Practice (2nd amendment) B.E. 2561 (2018).
- (9) “Article 8” is revised by the Council of Engineers Regulations on Recognition of Degrees, Certificates, or Diploma in the Regulated Engineering Practice (3rd amendment) B.E. 2564 (2021).
- (10) “Article 9 paragraph two” is revoked by the Council of Engineers Regulations on Recognition of Degrees, Certificates, or Diploma in the Regulated Engineering Practice (3rd amendment) B.E. 2564 (2021).
- (11) “Article 9 paragraph three” is revoked by the Council of Engineers Regulations on Recognition of Degrees, Certificates, or Diploma in the Regulated Engineering Practice (3rd amendment) B.E. 2564 (2021).
- (12) “Article 10” is revised by the Council of Engineers Regulations on Recognition of Degrees, Certificates, or Diploma in the Regulated Engineering Practice (3rd amendment) B.E. 2564 (2021).
- (13) “Article 11” is revised by the Council of Engineers Regulations on Recognition of Degrees, Certificates, or Diploma in the Regulated Engineering Practice (3rd amendment) B.E. 2564 (2021).
- (14) “Article 13” is revised by the Council of Engineers Regulations on Recognition of Degrees, Certificates, or Diploma in the Regulated Engineering Practice (2nd amendment) B.E. 2561 (2018).

Attachment 7
The Councils of Engineers Rule
On Accreditation of Engineering Education
(2017)

(Translation Document)

**The Councils of Engineers Rule
On Accreditation of Engineering Education
B.E. 2560 (2017)**

Whereas, it is appropriate to issue the Council of Engineers rule on accreditation of engineering education to promote the accreditation of engineering education.

By virtue of Section 7(1), Section 8 (3) and (7), and Section 33(3) of The Engineer Act B.E. 2542, with approval by Council of Engineers general assembly on April 8, B.E. 2558 (2015), and with approval of the Council of Engineers extraordinary general assembly No. 1/2560 on July 6, B.E. 2560 (2017), Board of the Council of Engineers issues rule of accreditation as follows:

Article 1. This rule shall be called “The Councils of Engineers Rule on Accreditation of Engineering Education B.E. 2560 (2017).”

Article 2. This rule shall be enacted on and from the following day of publication date in Royal Gazette.

Article 3. In this rule,

“Subcommittee” refers to the Subcommittee on Accreditation of Engineering Education, which is appointed by Board of the Council of Engineers.

“Educational Institution” refers to an educational unit or university, which offers engineering educational program or other program with substantially equivalent at higher educational level.

“Program” refers to a Bachelor degree education program in engineering or equivalent, which is offered by an educational institution under approval of University Board and responsible ministry of such educational institution.

Article 4. The accreditation of engineering education has objectives as follows,

- (1) To promote educational quality of engineering program curriculum which being offered in an educational institution to conform to the required graduate attributes for engineering profession practices.
- (2) To develop the COE outcome-based accreditation system in accordance with the international criteria for outcome-based assessment.
- (3) To provide recommendation from the subcommittee to educational institution that is offering the engineering educational program and granting at least the bachelor degree of engineering or other program substantially equivalent for educational quality improvement in accordance with international recognized education quality.
- (4) To register the accredited engineering education program in accordance with the international agreements and recognitions of education quality.
- (5) To register of COE program evaluators for outcome-based accreditation.

Article 5. The Board of Council of Engineers shall appoint a subcommittee and work groups to operate on this rule with the operating term in consistency with that of the Board of Council of Engineers

Article 6. The subcommittee is authorized to operate its functions and responsibility as follows,

- (1) To accredit engineering program domestically according to criteria and guides prescribed by the Council of Engineers.
- (2) To administrate and develop work systems, for accreditation of engineering education to attain the international recognition of quality engineering education and engineering profession.
- (3) To propose amendment of rules and regulations, relating to the accreditation of engineering education.
- (4) To prepare operational plan and budget, for development of work system relating to the accreditation of engineering education.
- (5) To train human resources and program evaluators, for the accreditation of engineering education.
- (6) To publicize, to coordinate and experiences transfer of international activities, relating to accreditation of engineering education to educational institution, professional practitioner, and corresponding stakeholders.
- (7) To prepare documents for recognition of accreditation system, according to international accord on accreditation of engineering education.
- (8) To publicize list of engineering education program, which are accredited by the Council of Engineers
- (9) To give recommendation for educational quality improvement to educational institution in accordance with graduate attributes for engineering profession.
- (10) To propose Board of the Council of Engineers the appointment of work groups, as it is necessary to assist the work of accreditation.
- (11) To operational report to the Board of the Council of Engineers.
- (12) To operate on other COE assigned functions.

Article 7. This rule on accreditation of engineering education shall be applied on voluntary basis of educational institution.

Article 8. Criteria, procedures and conditions of accreditation of engineering education and the registration of program evaluator shall be accordingly prescribed by the Council of Engineers

Publication Date: July 31, B.E. 2560.
Kamol Takabut
President, The Council of Engineers

Attachment 8

Washington Accord Provided Knowledge Profile and Graduate Attributes

Washington Accord Provided Knowledge Profile and Graduate Attributes

Educational institution is required to provide program curriculum with courses structure and course teachings that allow program student to have adequate knowledge profile and attributes that support student's attainment on program outcomes. The Washington Accord provided knowledge profile and graduate attributes are described as following tables.

Abbreviation	Washington Accord provided Knowledge Profile
WK1	A systematic, theory-based understanding of the natural sciences applicable to the discipline and awareness of relevant social sciences
WK2	Conceptually-based mathematics , numerical analysis, data analysis, statistics and formal aspects of computer and information science to support detailed analysis and modelling applicable to the discipline
WK3	A systematic, theory-based formulation of engineering fundamentals required in the engineering discipline
WK4	Engineering specialist knowledge that provides theoretical frameworks and bodies of knowledge for the accepted practice areas in the engineering discipline; much is at the forefront of the discipline.
WK5	Knowledge, including efficient resource use, environmental impacts, whole-life cost, re-use of resources, net zero carbon, and similar concepts, that supports engineering design and operations in a practice area
WK6	Knowledge of engineering practice (technology) in the practice areas in the engineering discipline
WK7	Knowledge of the role of engineering in society and identified issues in engineering practice in the discipline, such as the professional responsibility of an engineer to public safety and sustainable development*
WK8	Engagement with selected knowledge in the current research literature of the discipline, awareness of the power of critical thinking and creative approaches to evaluate emerging issues
WK9	Ethics, inclusive behavior and conduct. Knowledge of professional ethics, responsibilities, and norms of engineering practice. Awareness of the need for diversity by reason of ethnicity, gender, age, physical ability etc. with mutual understanding and respect, and of inclusive attitudes

* Represented by the 17 UN Sustainable Development Goals (UN-SDG)

Differentiating Characteristic	Washington Accord Provided Graduate Attributes (2021)
Engineering Knowledge: Breadth, depth and type of knowledge, both theoretical and practical	WA1: Apply knowledge of mathematics, natural science, computing and engineering fundamentals, and an engineering specialization as specified in WK1 to WK4 respectively to develop solutions to complex engineering problems
Problem Analysis Complexity of analysis	WA2: Identify, formulate, research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences with holistic considerations for sustainable development* (WK1 to WK4)
Design/development of solutions: Breadth and uniqueness of engineering problems i.e., the extent to which problems are original and to which solutions have not previously been identified or codified	WA3: Design creative solutions for <i>complex</i> engineering problems and design systems, components or processes to meet identified needs with appropriate consideration for public health and safety, whole-life cost, net zero carbon as well as resource, cultural, societal, and environmental considerations as required (WK5)
Investigation: Breadth and depth of investigation and experimentation	WA4: Conduct investigations of <i>complex</i> engineering problems using research methods including research-based knowledge, design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions (WK8)
Tool Usage: Level of understanding of the appropriateness of technologies and tools	WA5: Create, select and apply, and recognize limitations of appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering problems (WK2 and WK6)
The Engineer and the World: Level of knowledge and responsibility for sustainable development	WA6: When solving complex engineering problems, analyze and evaluate sustainable development impacts* to: society, the economy, sustainability, health and safety, legal frameworks, and the environment (WK1, WK5, and WK7)
Ethics: Understanding and level of practice	WA7: Apply ethical principles and commit to professional ethics and norms of engineering practice and adhere to relevant national and international laws. Demonstrate an understanding of the need for diversity and inclusion (WK9)
Individual and Collaborative Team work: Role in and diversity of team	WA8: Function effectively as an individual, and as a member or leader in diverse and inclusive teams and in multi-disciplinary, face-to-face, remote, and distributed settings (WK9)

Differentiating Characteristic	Washington Accord Provided Graduate Attributes (2021)
<p>Communication: Level of communication according to type of activities performed</p>	<p>WA9: Communicate effectively and inclusively on <i>complex</i> engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, taking into account cultural, language, and learning differences.</p>
<p>Project Management and Finance: Level of management required for differing types of activity</p>	<p>WA10: Apply knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, and to manage projects and in multidisciplinary environments.</p>
<p>Lifelong learning: Duration and manner</p>	<p>WA11: Recognize the need for, and have the preparation and ability for i) independent and life-long learning ii) adaptability to new and emerging technologies and iii) critical thinking in the broadest context of technological change (WK8)</p>

*Represented by the 17 UN Sustainable Development Goals (UN-SDG)



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