International Journal of Engineering Education (IJEE)
e-ISSN : 2540-9808

The Roles of Different Committees in ABET Accreditation Process for Engineering Programs

Mahmoud Saber Youssef[1*]

[1]Mechanical Engineering Department, College of Engineering, Taif University, Al-Haweiah, P.O. Box 888, Saudi Arabia
E-mail: youssef2056@yahoo.com

Abstract - *Different engineering degree programs are accredited by the Engineering Accreditation Commission (EAC). This commission is considered one among the four commissions of the Accreditation Board for Engineering and Technology (ABET). All programs seeking accreditation from the Engineering Accreditation Commission of ABET must demonstrate that they satisfy all of the eight General Criteria for Baccalaureate Level Programs. Therefore, to execute these different ABET criteria and guidelines, any engineering program must establish different committees. In this paper, we nominate different committees and clearly mention their tasks in details. Moreover, the time schedules for the different activities of these committees during both fall and spring semesters are proposed. Another contribution of this article is to present a robust scheme for continuous improvement process. The roles of the contribution of some program committees in this scheme are described clearly. Therefore, the authors thought that the proposed scheme can serve as a strong reference in continuous improvement process for all engineering programs.*

Keywords *– ABET Accreditation, Accreditation Criteria, EAC Criteria, Student Outcomes.*
Submission: November 22, 2021 Correction: June 13, 2022 Accepted: June 13, 2022

Doi: http://dx.doi.org/10.14710/ijee.4.1.8-16
[How to cite this article: Youssef, M. S. (2022). The Roles of Different Committees in ABET Accreditation Process for Engineering Programs. *International Journal of Engineering Education, 4*(1), 8-16. doi: http://dx.doi.org/10.14710/ijee.4.1.8-16]

1. Introduction

All programs seeking accreditation from the Engineering Accreditation Commission of EAC-ABET must satisfy all of the General Criteria for Baccalaureate Level Programs recognized and determined by ABET. There are eight criteria in which apply to all accredited engineering programs. Furthermore, these criteria are intended to foster the systematic pursuit of improvement in the quality of engineering education that satisfies the needs of its constituencies in a dynamic and competitive environment [1]. It is the responsibility of the institution seeking accreditation of an engineering program to assign different committees to implement the different tasks of accreditation. Therefore, the present article is organized as follows. Sections II-VII present the recommended different committees and their tasks in detail. Section VIII is devoted to the time weekly schedule of the different committees for both fall and spring semesters of any academic year. Rest of this paper is focused in Section IX for robust scheme for closing loop of continuous improvement process. Ultimately, we conclude the present article in Section X.

2. Assessment and Continuous Improvement Committee (ACIC) Tasks

1. Assign the coordinators/instructors for the courses every semester according to the specialist of every faculty.
2. Review the portfolios of different courses and verify the different topics of the courses that have been taught during each semester.
3. Review the courses assessment results based on various materials through direct and indirect assessment methods.
4. Review and check the different evidences related to the attainment of Student Outcomes, SOs, gathered by coordinators/instructors from Assignments, Quizzes, Exams, Mini projects.
5. Check the different suggested actions by the coordinators/instructors to overcome the barriers they faced and fill in Form (B) [see Appendix A].
6. Follow up the approved actions in Forms (A) [see Appendix B] by the Program Council Meeting to implement the suggested scheme for closing continuous improvement loop.

All the collected results by the committee (ACIC) reported and forwarded to the Program Accreditation

Committee (PAC) for further discussions/recommendations. Moreover, the committee documents all its meetings and has the right to suggest any additional tasks/processes to enhance its performance.

3. Laboratories Committee (LC) Tasks

1. Register schedule for periodic preventive maintenance with the maintenance company for the program labs at the beginning of every academic year.
2. Report the completion of the periodic preventive maintenance and the status of the equipment or facility to the program head.
3. Receive a job order or request from the employee or faculty supervising the corresponding lab regarding any equipment malfunction whenever happened.
4. Coordinate with the maintenance company the problem symptoms, propose maintenance action, and estimate maintenance duration.
5. Receive a report from the maintenance company with the completion of the maintenance procedure, whether successful or unsuccessful. LC notifies the program head with the service provider report.
6. Investigate with the employee or faculty supervising the corresponding lab the different safety devices to check their appropriateness.
7. Revise the proposed actions taken by the coordinators/instructors to remedy the barriers they faced during teaching their courses and that is mentioned in the Course Current Data Form (Form B).

LC reports the program head with all reports from the maintenance company. Also, all the revised proposed actions taken regarding the labs facilities and equipment are collected and forwarded to the Program Accreditation Committee (PAC) for further discussions/recommendations. Moreover, the committee documents all its meetings and has the right to suggest any additional tasks/processes to enhance its performance.

4. Program Accreditation Committee (PAC) Tasks

1. Investigate the appropriate actions recommended by ACIC in Form (B) regarding the different courses taught during each semester.
2. Report the Program Council Meeting with the different recommendations/suggestions and feedbacks from all the committees to get the needed final approval**.**
3. Organize and guide all tasks related to international and national accreditations such as the following tasks:
   - ♦ Spread the different national and international accreditation knowledge.
   - ♦ Collect all the information and data needed for the preparation of the Self Study Reports (SSR) when needed.
   - ♦ Follow up the responses of national and international accreditation organizations.
4. Review the Program Educational Objectives, PEOs based on the feedbacks of the program' constituencies. Also, review the curriculum of the program in a regular basis to consider the different feedbacks of both stakeholders and program' alumni.

PAC documents all its meetings and has the right to suggest any additional tasks/processes to enhance its performance.

5. Senior Projects Committee (SPC) Tasks

1. To collect the new proposals for Senior Projects (1) & (2) and announce them to the students to choose their graduation projects.
2. To nominate teams from three to five students for each Senior Project based on proposed criteria in case if the students are oriented to specific topics. The proposed main criteria for this nomination are; the student choice priorities, the intention of taking the proposed selected elective courses and the student CGPA.
3. To hold a yearly-basis general seminar with the senior students at the beginning of each fall semester for using the realistic constraints and engineering standards in different engineering applications. The main aim of this seminar is to enhance the knowledge of senior students regarding these constraints and engineering standards. Moreover, holding a meeting with the supervisors of senior projects on the second week of every fall semester in which senior project (1) is taught. Therefore, the supervisors of senior projects should illustrate the realistic constraints and engineering standards related to the topics of their senior projects. They have to explain these topics to the students under their supervision.
4. Before the final exam of senior projects (1) & (2), SPC reviews the reports every Fall and Spring semesters. Regarding the senior project (2) report, SPC verifies incorporate realistic constraints and the appropriate engineering standards used.
5. To organize the final exam for the senior projects (1) & (2).
6. To report the Program Accreditation Committee (PAC) with completeness of its duties by the end of each semester.

SPC documents all its meetings and has the right to suggest any additional tasks/processes to enhance its performance.

6. Students Affairs and Industry Relationship Committee (SAIRC) Tasks

6.1 Tasks Related to Summer Training Session

1. To select the students who are eligible to conduct summer training in coordination with the academic advisors.
2. To coordinate with the College's Training Unit the following tasks:
   - ❋ Seeking an appreciate working place for each eligible student.
   - ❋ Monitoring the internship done by each student through field visits.

- ❋ Holding a final presentation to evaluate the training session.

3. To conduct and analyze the Summer Training Survey and report with its results to the Program Accreditation Committee (PAC).

6.2 Tasks Related to Career Advisory

1. To develop relationships with the industry for the benefits of students.
2. To invite the stockholders of different organizations/institutions to explain their needed skills of graduates.
3. To collect and spread out information about career days in different Saudi Universities.
4. To conduct and analyze the Senior Students Exit Survey, Alumni Survey, and Employer Survey and report with these results to the Program Accreditation Committee (PAC).

6.3 Tasks Related to External Advisory Board, EAB

1. To hold a yearly meeting with external visitors and/or stakeholders and some of the faculty of the program.
2. To improve the quality and effectiveness of the Engineering B.Sc. degree through the identification of market needs.
3. To evaluate and recommend continuous improvement in undergraduate curriculum and report with these results to the Program Accreditation Committee (PAC).

6.4 Tasks Related to Students Advisory Board, SAB

1. To hold a yearly meeting with the department's students and faculty.
2. To collect feedbacks from students about various issues such as curriculum modification, facilities, and institutional support.
3. To contribute in the discussion related to the review process of the Program Educational Objectives, PEOs.
4. To encourage the students to positively interact with community.
5. To report the Program Accreditation Committee (PAC) with any collected comments and/or feedbacks.

SAIRC documented all its meetings and it has the right to suggest any additional tasks/processes to enhance its performance.

7. Academic Advisory Committee (AAC) Tasks

1. To allocate groups of students to the academic advisors with the coordination of the chairman of department.
2. To serve as a link between the academic advisors and the administration section.
3. To conduct an equivalency for transferred students.
4. To monitor the CGPA of students and violation of courses prerequisites in coordination with the academic advisors.
5. To help and solve any problem raised with any academic advisor regarding the students' academic career, and personal problems.

AAC has the right to suggest any additional tasks/processes to enhance its performance and documents all its meetings.

8. Time Weekly Schedules of Different Accreditation Committees

The engineering programs seeking accreditation from EAC-ABET need to prepare a Self Study Report. This report is considered the primary document uses to explore the compliance of any engineering program with all applicable ABET criteria and policies [1]. The process of preparing a Self Study Report of any engineering program is expected to encompass both a quantitative and qualitative assessment of the strengths and limitations of that program [1]. Therefore, in the following Tables and referring to the abbreviation mentioned above for the different committees, the weekly time schedule for both fall and spring semesters activities of the different committees is clearly described.

Table 1. ACIC Time Weekly Schedule – Fall Semester

Week #	Tasks
1st Week	Complete Form (A) with the approved actions by the Program Council Meeting and submit these forms to the coordinators/instructors.
2nd Week	The Committee meets the supervisors of senior projects (1) & (2) for discussion about the realistic constraints and engineering standards.
8th Week	Meet each coordinator/instructor to follow up the course(s) schedule and implement the approved actions mentioned in Form (A).
15th Week	Assign the instructors of courses for next spring semester.
The week before the last week of fall semester	1- Review the evaluation results of courses and complete Form (B). 2- Coordinate with Lab Committee, LC, to finish Forms (B) and report with the all collected actions to PAC.

Table 2. LC Time Weekly Schedule – Fall Semester

Week #	Tasks
1st Week	Register schedule for the periodic preventive maintenance with maintenance company. Report the completion of the periodic preventive maintenance and the status of the equipment or facility to the program head.
At any time in any Week	Receive requests or job orders from the employees or faculties supervising the labs regarding any equipment malfunction in their labs (if any). In this case, LC arranges with the maintenance company to confirm problem symptoms, propose maintenance action, and estimate the maintenance duration. Maintenance company reports LC the completion of the maintenance procedure, whether successful or unsuccessful.
The week before the last week of fall semester	1- Revise the proposed actions taken to remedy the barriers in different courses and fill in Form (B) for each course in fall semester. 2- Report with the all collected actions of Form (B) to PAC.

Table 3. PAC Time Weekly Schedule – Fall Semester

Week #	Tasks	
1st & 2nd Weeks	1- Receives and analyzes the feedbacks from SAIRC about the Summer Training Survey. 2- Notifies the Program Council Meeting with Summer Training results.	Doing all the tasks related to national and international accreditation whenever requested.
8th Week	1- Receives and analyzes the feedbacks from SAIRC about the Alumni and Employer Surveys every two years. 2- The committee discusses the list of students whose CGPA less than 2.0 and violations' cases (if any) as well as notifies the Program Council Meeting with these issues.	
Two weeks before the last week of fall semester	1- Receives and analyzes the feedbacks from SAIRC about EAB meeting. 2- Notifies the Program Council Meeting with feedbacks received from SAIRC and SPC.	
The last week of fall semester	1- Investigating the appropriate improvement actions recommended by other committees. 2- Reporting with the all collected actions and feedbacks from different committees to the Program Council Meeting for final approval.	

Table 4. SPC Time Weekly Schedule – Fall Semester

Week #	Tasks
1st Week	Hold a general seminar with the senior students on realistic constraints and engineering standards in different engineering applications.
2nd Week	Hold a meeting with all the supervisors of senior projects to stick the implementation of the realistic constraints and engineering standards in the engineering applications and to explain the effectiveness and vital importance of their usage.
Two weeks before the last week of fall semester	1- Organize the final exam for the Senior Project (1). 2- Report the PAC with completeness of Senior Project (1) and Fall semester activities.

Table 5. SAIRC Time Weekly Schedule – Fall Semester

Week #	Tasks
1st and 2nd Weeks	1- Hold a final presentation to evaluate the training session. 2- Conduct and analyze the Summer Training Survey. 3- Report with the all collected results and feedbacks to PAC.
8th Week	1- SAIRC organizes, conducts, and analyzes the Alumni and Employer Surveys every two years. 2- Reports to PAC with the results of these surveys.
Two weeks before the last week of fall semester	1- Hold a meeting with external visitors/stakeholders (External Advisory Board, EAB). 2- Report to PAC with the feedbacks of EAB meeting.

Table 6. AAC Time Weekly Schedule – Fall Semester

Week #	Tasks
2nd - 8th Weeks	1- Monitor the CGPA of students and violation of courses prerequisites in coordination with the academic advisors as well as applying the rules of enhancing low values of CGPA of students. 2- Report with the list of students whose CGPA less than 2.0 and violations' cases (if any) to PAC.

Table 7. ACIC Time Weekly Schedule – Spring Semester

Week #	Tasks
1st Week	Complete Form (A) and submitted to the instructors.
8th Week	Meet each instructor to follow up the course(s) schedule and Form (A).
15th Week	Assign the instructors of courses for next fall semester.
Two weeks before the last week of spring semester	The Committee in coordination with the supervisors of Senior Project (2) reviewed the senior project reports to verify incorporate realistic constraints and appropriate engineering standards.
The week before the last week of spring semester	1- Review the courses assessment results and complete Form (B). 2- Report with the all collected actions in Form (B) of different courses to PAC.

Table 8. LC Time Weekly Schedule – Spring Semester

Week #	Tasks
At any time in any Week	Receive requests or job orders from the employees or faculties supervising the labs regarding any equipment malfunction in their labs (if any). In this case, LC arranges with the maintenance company to confirm problem symptoms, propose maintenance action, and estimate maintenance duration. Maintenance company reports LC the completion of the maintenance procedure, whether successful or unsuccessful.
The week before the last week of spring semester	1- Revise the proposed actions taken to remedy the barriers in different courses in spring semester and fill in Form (B) for each course in spring semester. 2- Report with the all collected actions in Form (B) of different courses to PAC.

Table 9. PAC Time Weekly Schedule – Spring Semester

Week #	Tasks	
1st & 2nd Weeks	1- Receives and analyzes the feedbacks from SAIRC meeting about the Student Advisory Board, SAB. 2- Notifies the Program Council Meeting with these results.	Doing all the tasks related to national and international accreditation whenever requested.
8th Week	The committee discusses the list of students whose CGPA less than 2.0, violations' cases (if any) and status of transferred students as well as notifies the Program Council with these issues.	
15th Week	Receives and analyzes the feedback from SAIRC about the senior students exit survey and notifies the Program Council with this feedback.	
Two weeks before the last week of spring semester	Notifies the Program Council Meeting with the received feedbacks from SPC.	
The last week of spring semester	1- Investigating the appropriate improvement actions recommended by other committees. 2- Reporting with the all collected actions and feedbacks from different committees to the Program Council Meeting for final approval.	

Table 10. SPC Time Weekly Schedule – Spring Semester

Week #	Tasks
Two weeks before the last week of Spring semester	1- For the upcoming academic year ■ Collecting the new proposals for Senior Projects (1) & (2). ■ Nominating teams of three-five students for each senior project based on proposed criteria. 2- For the current semester (spring semester) ■ The Committee in coordination with the supervisors of Senior Project (2) reviewed the senior project reports to verify incorporate realistic constraints and appropriate engineering standards. ■ Organizing the final exam for the Senior Project (2). ■Reporting PAC with the completeness of spring activities.

Table 11. SAIRC Time Weekly Schedule – Spring Semester

Week #	Tasks
1st and 2nd Weeks	1- Hold a meeting with the department students (Student Advisory Board, SAB) and faculty. 2- Report with the all collected results and feedbacks to PAC.
8th Week	Select the students who are eligible to conduct summer training in coordination with the academic advisors.
15th Week	1- Conduct and analyze the Senior Students Exit Survey. 2- Report with the all collected results and feedbacks to PAC.

Table 12. AAC Weekly Time Schedule – Spring Semester

Week #	Tasks
2nd - 8th Weeks	1- Monitoring the CGPA of students and violation of courses prerequisites in coordination with the academic advisors as well as applying the rules of enhancing low values of CGPA. 2- Conducting an equivalency for transferred students. 3- Reporting PAC with the list of students whose CGPA less than 2.0 and violations' cases (if any).

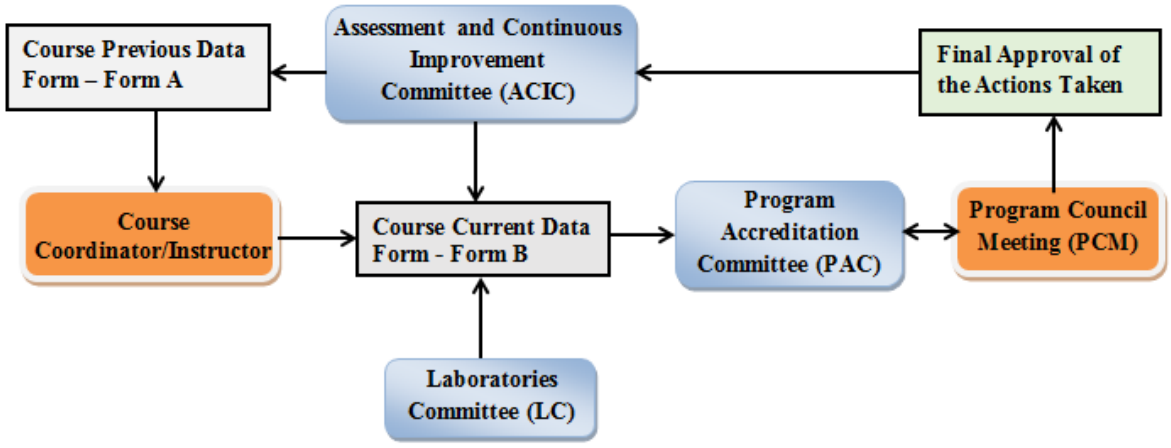

Figure 1. Scheme for closing Loop of Continuous Improvement Process

9. Robust Scheme for Closing Loop of Continuous Improvement Process

Criterion # 4 is the cornerstone of the Self Study Report of any engineering program. In this criterion, the program must regularly use appropriate, documented processes for assessing and evaluating the extent to which the student outcomes are being attained [2]. The gathered results of these evaluations must be systematically utilized as input for the program's continuous improvement actions. Sometimes, the program has not acted upon possible action for some outcomes indicating a gap in the continuous improvement process. To implement all the possible actions taken in continuous improvement process of the program, a robust scheme is proposed in this paper. In the present scheme, the instructors and different committees are incorporated to overcome any gap may be happened in the continuous

improvement process of the program. A flow chart for the robust scheme presented in this article is shown in Figure 1. For sake of simplicity of understanding the flow chart, different items shown on figure 1.

1) Coordinator/Instructor

Two weeks before the end of each semester (Fall or Spring), the coordinator/instructor preparing the course portfolio for the course(s) he/she taught. Then, the coordinator/instructor fills the course current data form – form B for every course he/she taught. In case if he/she faced with some barriers, he/she mentioned these barriers clearly in form B. Correspondingly, he/she suggests actions for improvement to overcome these barriers.

2) Course Current Data Form – Form B

The different forms of course current data form – form B for every course, ultimately, are forwarded to Assessment and Continuous Improvement Committee, ACIC, for revision.

3) Assessment and Continuous Improvement Committee, ACIC

The week before the last week of each semester (Fall or Spring), the Assessment and Continuous Improvement Committee, ACIC, reviewing the course current data form – form B for all courses taught. In this case, implementations of the previous approved actions (if any) related to the student outcomes attainments and the course topics as well as course syllabus are verified. Moreover, the course current barriers (if any) related to the topics taught against syllabus and the student outcomes attainments are reviewed. Also, the suggested actions by the coordinator/instructor to remedy the current barriers are revised and they are reported to the Program Accreditation Committee, PAC, for further discussions and recommendations. Moreover, ACIC forwards Form (B) to Laboratories Committee, LC, if there are issues related to Labs equipment recommended by lab captains.

4) Laboratories Committee, LC

The week before the last week of each semester (Fall or Spring), the Laboratories Committee, LC, reviewing the suggested actions by the lab captains in the course current data form – form B. Also, implementation of the previous approved actions related to any equipment malfunction or maintenance are verified by LC members. Then, the Laboratories Committee, LC, reports with the different accepted actions forms of Form (B) to the Program Accreditation Committee, PAC, for further discussions.

5) Program Accreditation Committee, PAC

During the last week of each semester (Fall or Spring), the Program Accreditation Committee, PAC, hold a meeting to verify the forwarded and reviewed actions from ACIC and LC regarding the student outcomes attainments and labs equipment issues in Form (B). Then, these all actions are forwarded to the Program Council Meeting, PCM, for further investigation and final approval.

6) Program Council Meeting, PCM

During the last week of each semester (Fall or Spring), the head of program call the program' faculty to hold a meeting to discuss the report of PAC regarding the different actions. During this meeting, the attendees investigate the different actions in the report of PAC to approve some or all the presented actions. By the end of meeting, the approved actions are decided and will be forwarded by the secretary of PCM to ACIC for activation. The unapproved actions are returned to PAC for further investigation.

7) Course Previous Data Form – Form A

First week of each new semester (Spring or Fall), ACIC completes the Course Previous Data Form – Form (A) of each course and submits these forms to each coordinator/instructor. By mid of the new semester, for closing the loop of continuous improvement process, ACIC meets each coordinator/instructor to follow up the approved actions mentioned in Form (A) concerning his/her course(s).

10. Discussion

The presented paper nominated different committees of an engineering program to conduct qualitative and quantitative tasks of accreditation by EAC-ABET. For each committee, different tasks were proposed with details. Also, the weekly schedules of activities for both fall and spring semesters activities for every committee were proposed in accord with the criteria and guidelines of EAC-ABET. Collaboration between different committees to execute their EAC-ABET tasks and activities is essential. Therefore, a robust scheme for closing loop of continuous improvement process has been proposed. The cornerstones of this scheme are course current data form (Form B) and course previous data form (Form A). Contributions between the coordinators/instructors, ACIC, LC, PAC and finally PCM were taken in consideration in Forms (A) and (B) as supportive of continuous improvements activities. We hope that the present article might be very useful for faculty they embark upon the journey of accrediting their engineering program by EAC-ABET.

References

[1] ABET, "*Criteria for Accrediting Engineering Programs, 2020 - 2021*" Available from https://www.abet.org/accreditation/accreditation-criteria/criteria-for-accrediting-engineering-programs-2020-2021/

[2] A. Shafi, S. Saeed, Y. A. Bamarouf, S. Z. Iqbal, N. Min-Allah, and M. A. AlQahtani, "Student Outcomes Assessment Methodology for ABET Accreditation: A Case Study of Computer Science and Computer Information Systems Programs", *IEEE Access*, Vol. 7, pp. 13653 – 13667, 2019.

Appendices
Appendix A: Course Current Data Form - Form B

<table>
<tr><td>Course Title:</td><td>Course Code:</td></tr>
<tr><td>Current Course Coordinator/Instructor:</td><td>Current Semester:</td></tr>
<tr><td colspan="2">Verification of the Previous Approved Actions
The previous approved actions are mentioned in Course Previous Data Form - Form A</td></tr>
<tr><td colspan="2">☐ The previous approved actions were implemented and effective (attach evidence)
☐ The previous approved actions were implemented and ineffective (attach evidence)
☐ The previous approved actions were not implemented (state reasons below)
…….</td></tr>
<tr><td colspan="2">Current Course Barriers (if any)
This part is filled by the course coordinator/instructor</td></tr>
<tr><td colspan="2">1-
2-

Signature of coordinator/instructor:</td></tr>
<tr><td colspan="2">Proposed Actions needed to Overcome the Current Course Barriers (if any)
This part is filled by the course coordinator/instructor</td></tr>
<tr><td colspan="2">1-
2-
Signature of coordinator/instructor:</td></tr>
<tr><td colspan="2">Responsible Committees for Revising the Proposed Actions (if any)
This part is filled by the ACIC and/or LC</td></tr>
<tr><td>☐ Assessment and Continuous Improvement Committee, ACIC (Actions related to Courses/Curriculum suggestions)</td><td>☐ Laboratories Committee, LC (Actions related to Labs Equipment)</td></tr>
<tr><td>Date of meeting: / / 202x
<u>Revised Actions by ACIC (if any):</u>
1-
2-

Signatures of ACIC members:</td><td>Date of meeting: / / 202x
<u>Revised Actions by LC (if any):</u>
1-
2-

Signatures of LC members:</td></tr>
<tr><td>Review of the Revised Actions taken by ACIC and/or LC (This part is filled by the PAC)</td><td>Approval of the Program Council Meeting (PCM) for the Reviewed Actions by PAC</td></tr>
<tr><td>Date of meeting: / / 202x
☐ Accepted
☐ Not accepted (state reasons below)
☐ Return to ACIC and/or LC (state reasons below)

Signatures of PAC members:</td><td>Date of meeting: / / 202x
☐ Approved and sent to ACIC for activation
☐ Not Approved
☐ Return to PAC (state reasons below)

Signature of Head Program:</td></tr>
</table>

Appendix B: Course Previous Data Form - Form A

(Assessment and Continuous Improvement Committee, ACIC, filled and submit this form to the coordinator/instructor of the course by the first week of each semester)

Course Title:	**Course Code:**
Last Course Coordinator/Instructor:	**Last Semester the Course Offered:**
Course Barriers of the Last Semester	
1- 2- 3- .. Signatures of ACIC members:	
The Approved Actions of the Last Semester by Program Council Meeting (PCM) (Approval Meeting #: Approval Date: / / 202x)	
1- 2- 3- .. Signatures of ACIC members:	