ASEE AMERICAN SOCIETY FOR ENGINEERING EDUCATION

Paper ID #49560

A Workshop on ABET-EAC Accreditation Evaluation

Dr. Amir Karimi, The University of Texas at San Antonio

Amir Karimi, University of Texas, San Antonio Amir Karimi is a Professor of Mechanical Engineering at The University of Texas at San Antonio (UTSA). He received his Ph.D. degree in Mechanical Engineering from the University of Kentucky in 1982. His teaching and research interests are in thermal sciences. He has served as the Chair of Mechanical Engineering (1987 to 1992 and September 1998 to January of 2003), College of Engineering Associate Dean of Academic Affairs (Jan. 2003-April 2006), and the Associate Dean of Undergraduate Studies (April 2006-September 2013). Dr. Karimi is a Fellow of ASEE, a Fellow of ASME, senior member of AIAA, and holds membership in ASHRAE, and Sigma Xi. He has served as the ASEE Campus Representative at UTSA, ASEE-GSW Section Campus Representative, and served as the Chair of ASEE Zone III (2005-07). He chaired the ASEE-GSW section during the 1996-97 academic year.

A Workshop on ABET-EAC Accreditation Evaluation

Amir Karimi
Mechanical Engineering Department
The University of Texas at San Antonio

Abstract

The Engineering Accreditation Commission (EAC) of ABET periodically make changes to its accreditation process[1,2,3,4]. A major change occurred in late 1990s when the general accreditation criteria containing seven (7) criterion and a program criteria, specific to a given engineering degree program, were developed and implemented in 2000[1]. The major elements of these criteria were Criterion 2-Program Educational Objectives and Criterion 3-Program Outcomes (a-k) and Assessment. In 2008-09 evaluation cycle, the title of Program Outcomes (PO) and Professional Components were changed to Student Outcomes (SO) and Curriculum, respectively. Also, the requirements for evaluation of PEOs and POs were removed from criteria 2 and 3 and became a part of requirements for an added Criterion 4-Contineous Improvement. During 2012-13 evaluation cycle, ABET-EAC, removed the requirement of evaluation of PEOs from Criterion 4-Continuous Improvement[1]. Also, since 2012-13 accreditation cycle, programs have not been required to demonstrate the attainment of the elements included in the specific Program Criteria[1]. After an extensive review process, from 2009 through 2017, the EAC of ABET modified criterion 3 (SOs) and Criterion 5 (Curriculum). The major changes included the replacement of SOs (a-k) by the new SOs (1-7) in Criterion 3, changes to criterion 5, and expanding the definitions of the terminologies used in the accreditation criteria[1,2,3]. The implementation of the new changes began in 2019-2020 ABET evaluation cycle[4]. Since 2019, there has been minor changes on the focus of evaluation for accreditation of engineering programs by program evaluators.

The author of this proposed workshop has been an ABET program evaluator for 21 years, including chairing ABET evaluation teams for five years, while serving as a commissioner of ABET-EAC. Through his ABET evaluation service, the author has participated in 28 ABET evaluation processes, including 14 evaluations as the team chair. In additions, the author had been responsible for the preparations of ABET accreditation visit of the mechanical engineering program in his institution for a number of times, as well as leading the preparation for accreditation of all all engineering programs in the college during two accreditation cycles. Lessons learned through these evaluation processes, the author proposes to organize a workshop for the ASEE-GSW section on the of ABET Accreditation Processes to assist those programs that are preparing for accreditation/re-accreditation in the next few years. The workshop will include a short presentation that provides Dos and Don'ts strategies for a successful ABET accreditation visit. Then the audience will be invited to ask questions or share their own experiences with ABET accreditation processes. The main topics that will be highlighted in the workshop, include the followings.

Criterion 1-Students

- How student performances evaluated.
- Who is responsible for approving prerequisite waivers and course substitutions (both local

and transfer credits)?

- Who is responsible for checking if all the degree requirements are completed before granting degrees.

Criterion 2. Program Educational Objectives (PEOs)

- Have the appropriate program constituencies identified and been involved in reviewing the PEOs during the accreditation cycle and documented?
- Are PEOs consistent with the institutional mission, the program's constituents' needs, and these ABET-EA criteria and do not sound like Student Outcomes (SOs)?

Criterion 3. Student Outcomes (SOs)

- If the program has defined its own SOs, do they cover all the requirements of SOs 1-7?

Criterion 4.Continuous Improvement

- One of the highest number of shortcomings cited by program evaluators (PEVs) are related to this criterion.
- Programs should be careful if it uses a course that common among more than one program in the assessment and evaluation process, in order to demonstrate the attainment of SOs .
- Has the program systematically utilized the results of these evaluations of the attainment of SOs as input for the program's continuous improvement actions[5,6,7,8,9,10].

Criterion 5. Curriculum

- Some programs are cited a shortcoming, because the curriculum for the degree program do not contain a minimum of 30 semester credit hours (or equivalent) of a combination of college-level mathematics and basic sciences with experimental experience appropriate to the program.
- Some programs are cited a shortcoming, because the curriculum for the degree program do not contain a minimum of 45 semester credit hours (or equivalent) of a engineering topics appropriate to the program, consisting of engineering and computer sciences and engineering design, and utilizing modern engineering tools.
- Does the curriculum for the degree contain a culminating major engineering design experience that 1) incorporates appropriate engineering standards and multiple constraints, and 2) is based on the knowledge and skills acquired in earlier course work.

Criterion 6. Faculty

- Can the program demonstrate that the faculty members are of sufficient number and they have the competencies to cover all of the curricular areas of the program
- Are the faculty number sufficient to accommodate adequate levels of student-faculty interaction, student advising and counseling, university service activities, professional development, and interactions with industrial and professional practitioners, as well as employers of students.

Criterion 7. Facilities

- Classrooms, offices, laboratories, and associated equipment must be adequate to support attainment of the student outcomes and to provide an atmosphere conducive to learning.
- Modern tools, equipment, computing resources, and laboratories will be checked by the PEVs.

Criterion 8. Support

- Sufficient number of administrative and technical staff
- Adequate financial support to attract, retain, and provide for the continued professional

development of a qualified faculty

- Sufficient support to acquire, maintain, and operate infrastructures, facilities, and equipment.

Program Criteria

- Different for each engineering program. The Program Criteria is developed by one or more lead societies, for Example ASCE for civil engineering, IEEE for Electrical or computer Engineering, ASME for Mechanical engineering.
- Requirements stipulated in the Program Criteria are limited to the areas of curricular topics (mostly covered by the general curriculum) and faculty qualifications.

Is it helpful to follow the ABET template for the preparation of self-study report.

References

1. Karimi A., 2017, "How the Proposed Changes in ABET-EAC-Criteria 3 and 5 Effects Assessment Process?" *Proceedings of the* 2017- *ASEE-GSW Section Conference,* Paper ID # 111, March 12-14, 2017, Dallas, Texas
2. Barr, R.E., 2016, "Proposed Changes to ABET Criteria 3 and 5," *Proceedings of 2016 ASEE-GSW Section Conference*, Paper ID # 103, March 6-8, 2016, Fort Worth, Texas
3. Barr, R.E., 2017, "An ABET Preparation Perspective Under the New Proposed Criteria 3 and 5," *Proceedings of 2017 ASEE-GSW Section Conference*, Paper ID #20, March 12-14, 2017, Dallas, Texas
4. Karimi, A., and Manteufel, R. 2020, " Most Recent Updates to ABETT-EAC Criteria 3, 4, and 5, " *Proceedings of the* 2020- *ASEE-GSW Section Virtual Conference,* Paper ID # 109, April 12-14, 2020, Albuquerque, NM.
5. Karimi, A., Clutter, K., and Arroyo, A.,2003, "An Example of Course and Program Outcome Assessment-Process and Results," *ASEE 2004-1793,* Proceedings of the 2004ASEE Annual Conference, Salt Lake City, Utah, June 20-23, 2004.
6. Karimi, A., 2005, "Lessons Learned in the Assessment of Course and Program Outcomes Processes," presented in session T3B2, 2005 Annual Meeting of the Gulf-Southwest Section of ASEE, Corpus Christi, Texas, March 23-25, 2005.
7. Karimi, A., 2005, "Course and Program Outcome Assessment Process," *IMECE2005-81962,* Proceedings of *IMECE2005*, Proceedings of ASME International Mechanical Engineering Congress and Exposition November 5-11, 2005, Orlando, Florida.
8. Manteufel, R. and Karimi, 20016, "Promoting Consistent Assessment of Student Learning Outcomes over Multiple Courses and Multiple Instructors in Continuous Program Improvement," *Proceedings of the* 2016 *ASEE Annual Conference and Exposition*, ID #: 16508, June 26-29, 2016, New Orleans, LA.
9. Manteufel, R. and Karimi, A, 2021, "Broad Faculty Participation in Course-level Evaluation of Student Outcomes Supporting Continuous Improvement of an Undergraduate Engineering Program," *Proceedings of* 2021 ASEE-GSW S Section Virtual Annual Conference, Paper ID #35144, March 2021
10. Karimi, A.,2021, and Manteufel, R.D., "Preparation of Documents for ABET Accreditation during the COVID-19 Pandemic," *Proceedings of* 2021 ASEE-GSW Section Virtual Annual Conference, Paper ID #35113, March 2021

AMIR KARIMI

Amir Karimi is a Professor of Mechanical Engineering at The University of Texas at San Antonio (UTSA). He received his Ph.D. degree in Mechanical Engineering from the University of Kentucky in 1982. His teaching and research interests are in thermal sciences. He has served as the Chair of Mechanical Engineering (1987 to 1992 and September 1998 to January of 2003), College of Engineering Associate Dean of Academic Affairs (Jan. 2003-April 2006), and the Associate Dean of Undergraduate Studies (April 2006-September 2013). Dr. Karimi is a Fellow of ASEE, a Fellow of ASME, senior member of AIAA, and holds membership in ASHRAE, and Sigma Xi. He has served as the ASEE Campus Representative at UTSA, ASEE-GSW Section Campus Representative, and served as the Chair of ASEE Zone III (2005-07). He chaired the ASEE-GSW section during the 1996-97 academic year.