

Preparing International Engineering Programs for Accreditation

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Abstract

A large number of international academic institutions offering engineering programs have successfully gone through the accreditation process over the past decade. However, many more programs in the Middle East and the Far East are actively working to prepare for accreditation in the coming years. Texas A&M University at Qatar has been one of such academic institutions in the Middle East that all its engineering programs became accredited over a decade ago.

This paper outlines the process developed and implemented by the institution and its engineering programs to get ready for the initial review and successfully institutionalized the lessons learned throughout the years. The article also discusses the challenges normally faced at the early stage and the training required to engage the faculty and staff for a successful visit fully.

Keywords

Accreditation, International Engineering Program, Initial Review Accreditation, Challenges in Accreditation, Training in Accreditation

1. Introduction

Academic programs normally go through a periodic review process to ensure they meet some educational standards set forth by an entity. This review process is often called accreditation and carried out by a governmental office or a designated organization. As stated, accreditation is conducted periodically to

ensure that the academic institutions continue to maintain their quality standards and to keep up with the technical changes observed and demanded by their stakeholders. In the United States, engineering, technology, computer science, and applied sciences programs accreditation are conducted by the Accreditation Board for Engineering and Technology (ABET), Inc. ABET is a non-governmental and non-profit organization which its primary function is to conduct program review. The accreditation process is voluntary, and programs are not obligated to go through this process. ABET accreditation is normally conducted by a group of expert volunteers where each of them represents a professional organization they belong to. ABET review teams are normally assembled from academic and industry communities with a substantial background in their fields. This paper's primary focus is on how to prepare international engineering programs for a successful accreditation review process.

2. Background

Review and accreditation of engineering programs in the US are conducted by the Engineering Accreditation Commission (EAC) of ABET. An engineering program requires to have at least one graduate before it requests for the first review. Upon successful completion of the first review, the engineering program requires to go through the accreditation process every six years. Each program is required to prepare a self-study using the most recent guidelines annually published by ABET. Preparation for a visit is a team effort and requires faculty members' participation. Engineering graduates interested in pursuing engineering registration to become professional engineers (PE) in the United States, must receive a degree from an ABET-accredited engineering degree-awarding institution.

3. International Programs and the Accreditation Process

The Engineering Accreditation Commission (EAC) requires that engineering programs demonstrate they meet (satisfy) eight common criteria plus the discipline (program) criteria in which they seek accreditation. The program self-study must contain background about the institution, college, and the program. It must be noticed that only the program is reviewed for accreditation.

Per invitation to the State of Qatar, since 2003, the College of Engineering at Texas A&M University in College Station has established an engineering college in Doha, Qatar (Retnanto et al. 2018). Qatar is one of the fast-growing countries in the Middle East and the world which has been pioneered in exposing its young generation to western education, and the country has built some of the most advanced technology infrastructures in the world over the past two decades. Six United States-based universities, including Texas A&M University, Cornell University, Carnegie Mellon University, Virginia Common Wealth University, Northwestern University, and Georgetown University, have been offering degrees in specific disciplines in Qatar for over a decade and their graduates are employed by many local petrochemical and communication companies.

Texas A&M University at Qatar has been offering four engineering degrees in Chemical, Electrical, Mechanical, and Petroleum since 2003 and by December 2019, has graduated over 1,100 engineers. The curricula and learning outcomes for these programs are identical to programs offered on the main campus, and over 25% of the full-time faculty members engaged in teaching in Qatar have a similar appointment on the main campus. All four engineering programs received full accreditations in 2008 and were successfully reaccredited in 2014.

To better prepare for the accreditation, the College trained one faculty member for each program, and the process was further supervised by a faculty with an extensive background in accreditation. The College-wide coordinator responsible for accreditation has conducted monthly meetings to review and discuss the latest guidelines annually provided by the ABET headquarters. Each program has been recommended to identify courses that could be mapped to student outcomes. Each student outcomes recommended to be measured, and its level of attainment be documented at least every two years or with short frequencies. All programs have regularly and consistently met with their Industry Board of Advisors and constituencies at least once a year and reviewed and revisited the Program's Educational Objectives (PEOs) at least every two years.

All programs have developed and documented robust student career advising, which has been enriched by a frequent presentation by the members of the Industry Board, alumni, and potential employers. Those faculty members whose primary teaching interests are within-subject areas addressed by the course selected for accreditation serve as members of that course committee and are responsible for developing a rubric to measure and assess the collected data. At each monthly meeting, the progress achieved by the members of the accreditation committee is discussed and evaluated. All courses taught and delivered at the Qatar campus are in English, and faculty, staff, and students are all fluent in two or more languages.

Texas A&M University at Qatar faculty members are actively encouraged to attend conferences through a well-structured process that annually provides funds to attend technical workshops and to present scientific articles at international conferences relevant to their research and teaching interests. This policy ensures that all faculty members stay current in their field and deliver the latest knowledge and development in their fields to students. Furthermore, Texas A&M University at Qatar academic facility includes more than 700,000 square feet of instructional facilities, which house academic classrooms and over fifty states of the art laboratories equipped with over \$100 M equipment.

The school's academic policy encourages programs to annually prepare and update their self-studies, which in turn significantly reduces the magnitude of the work often required to prepare for a program review. All faculty participate in the preparation of the program self-study and well trained on the accreditation requirements.

4. Conclusions

Many engineering programs outside of the United States have embraced academic accreditation as a means to maintain and monitor the quality of their programs and continually keep their curriculum compatible with similar programs in western universities. Although the general perception to prepare for accreditation review often implies the faculty must invest a significant amount of time, however, the approach taken by Texas A&M University at Qatar which briefly presented in this article has proven that proper faculty familiarization with the process and annual documentation of program's progress will provide an effective and robust approach in program readiness for such visit.

References

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Biographies

Albertus Retnanto is a Professor of Petroleum Engineering at Texas A&M University at Qatar and has been in the Petroleum Engineering program since 2009. He received his Ph.D. degree in Petroleum Engineering (1998) from Texas A&M University. He teaches undergraduate courses in well testing, petroleum production systems, production engineering, petroleum technical presentation, natural gas engineering, and integrated asset development and makes significant curriculum enhancements to several courses. He held a Principal position with Schlumberger and has more than 18 years of experience worldwide in both technical and management positions in the area of well testing, field development, and production enhancement.

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