Revision 1, August 4, 2006

## Higher Education Commission

# SELF ASSESSMENT MANUAL


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## Preface:

The first edition of the Self Assessment Manual was used for conducting the First Workshop on Self Assessment of Programs / Departments which was organized by the Higher Education Commission on May 10th 2006 at Lahore. During the workshop feedback form the participants indicated the need for providing examples to increase comprehension of the manual. Accordingly examples where felt needed have been incorporated.

The Self Assessment criteria and the related standards remain unaltered. Figure 1 Self Assessment Procedures has been updated. The revision of the document was solely undertaken to make it user-friendly as far as possible and we hope that we have achieved our goals. To provide easy access to the functions of Quality Enhancement Cell and its organization, functions of QEC along-with its suggested organization has been added as well. (Appendix E).

Needless to say that further feed back from the users of this manual is more than welcomed.

Abdul Raouf
August 11, 2006
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## About the author:

Prof. Dr. Abdul Raouf is a distinguished scholar of international ranking, having a doctoral degree in Industrial Engineering and over fifty years experience in teaching, research and industry. He was at the University of Windsor, Windsor, Ontario, Canada for more than two decades as Head of Industrial Engineering. He served King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia as Professor in Systems Engineering Department for ten years. He was Rector Ghulam Ishaq Khan Institute of Engineering Sciences and Technology for six years. He has been University Professor and Advisor of University of Management and Technology, Lahore since 2005. Dr. Raouf has been appointed Patron and Professor, Institute of Quality and Technology Management, University of Punjab.

Dr. Raouf has published extensively in the areas of *Performance Evaluation* which include *Modeling and Optimization of Tasks* involving *Information Conservation*, *Information Reduction, Information Generation* and *Production System Optimization* in the areas of *Quality, Safety* and *Maintenance of Production Systems*. He has authored/co-authored seven books and contributed more than 130 research papers in refereed Journals and refereed conference proceedings.

Dr. Abdul Raouf is Editor-in-Chief, Journal of Quality in Maintenance Engineering and also on editorial advisory boards of nine international research Journals. Besides, he is Chairman, Quality Assurance Committee constituted by HEC. He has been appointed as a member of the Accreditation Committee, Education Department, Government of Punjab. He is member of Governing bodies of number of public and private Universities.

Recognizing his scholarly pursuits, Dr. Abdul Raouf was bestowed upon the coveted title of
'Sitara-e-Imtiaz' by the Government of Pakistan. The Higher Education Commission of Pakistan conferred upon him the title of Distinguished National Professor.

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## *INTRODUCTION

In recent years it has become an obligation that institutions of higher education demonstrate the effectiveness of their academic programs in providing high quality education that positively impacts students. Furthermore, most accrediting bodies and others concerned with quality assurance are requesting that institutions assess students' learning outcomes as a means of improving academic programs. This has led The Higher Education Commission (HEC ) to develop methods for assessing the quality of academic program.

Assessment is a systematic process of gathering, reviewing and using important quantitative and qualitative data and information from multiple and diverse sources about educational programs, for the purpose of improving student learning, and evaluating whether academic and learning standards are being met. The process culminates when assessment results are used to improve student learning. A successful assessment program includes the following :

1. Purpose identification
2. Outcomes identification
3. Measurements and evaluation design
4. Data collection
5. Analysis and evaluation
6. Decision-making regarding actions to be taken.

The purpose of this document is to outline the process of conducting self-assessment (SA) of academic programs. It is HEC that requires universities to conduct periodic self- assessment for its academic programs in order to improve them and ensure high academic standards. Self-assessment is an important tool for academic quality assurance and provides feedback for faculty and administration to initiate action plans for improvement.

This document is organized as follows: Section 2 states the objectives of self-assessment, followed by the procedure for self assessment in Section 3 and Section 4 presents the criteria for self assessment.

*For the development of this manual, work done by Prof. Dr. Salih O Duffuaa of KFUPM and his team has been used and the same is gratefully acknowledged.

## OBJECTIVES

The objectives of self-assessment are to:

2.1. Maintain and continuously enhance academic standards +

2.2. Enhance students' learning

2.3. Verify that the existing programs meet their objectives and institutional goals

2.4. Provide feedback for quality assurance of academic programs

2.5. Prepare the academic program for review by discipline councils

## 3. SELF- ASSESSMENT PROCEDURE

In this section the procedure for conducting a self-assessment is described. Each academic program shall undergo a self-assessment (SA) every two years (assessment cycle). The Quality Enhancement Cell (QEC) is responsible for planning, coordinating and following up on the self -assessment (SA) activities. The steps of the procedure for SA are as follows:

3.1 The QEC initiates the SA one semester prior to the end of the assessment cycle through the Vice Chancellor / Rector Office in which the program is offered. However, if the program is undergoing the SA for the first time, the department will be given one academic year for preparation.

3.2 Upon receiving the initiation letter the department shall form a program team (PT). The PT will be responsible for preparing a self-assessment report (SAR) about the program under consideration *over a period of one semester*. They will be the contact group during the assessment period.

3.3 The department shall submit the SAR to the QEC through the concerned Dean. The QEC reviews the SAR *within one month* to ensure that it is prepared according to the required format.

3.4 The Vice Chancellor / Rector forms a program assessment team (AT) in consultation with the QEC recommendations *within one month*. The AT comprises of 2- 3 faculty members from within or outside the university. The AT must have at least one expert in the area of the assessed program.

3.5 The QEC plans and schedules the AT visit period in coordination with the department that is offering the program.

3.6 The AT conducts the assessment, submits a report and presents its findings in an exit meeting that shall be attended by the QEC, Dean and PT and faculty members.

3.7 The QEC shall submit an executive summary on the AT findings to the Vice Chancellor / Rector.

3.8 The Department shall prepare and submit an implementation plan to QEC based on the AT findings. The plan must include AT findings and the corrective actions to be taken, assignment of responsibility and a time frame for such actions**.** Table A.2 in Appendix A provides a format for preparing a summary of the implementation plan.

3.9 The QEC shall follow up on the implementation plan to ensure departments are adhering to the implementation plan. The academic department shall inform the QEC each time a corrective action is implemented. QEC shall review the implementation plan once a semester to assess the progress of implementation. Table A.2 will provide the QEC with guidelines for monitoring the implementation.

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For QEC functions and its organization see Appendix E

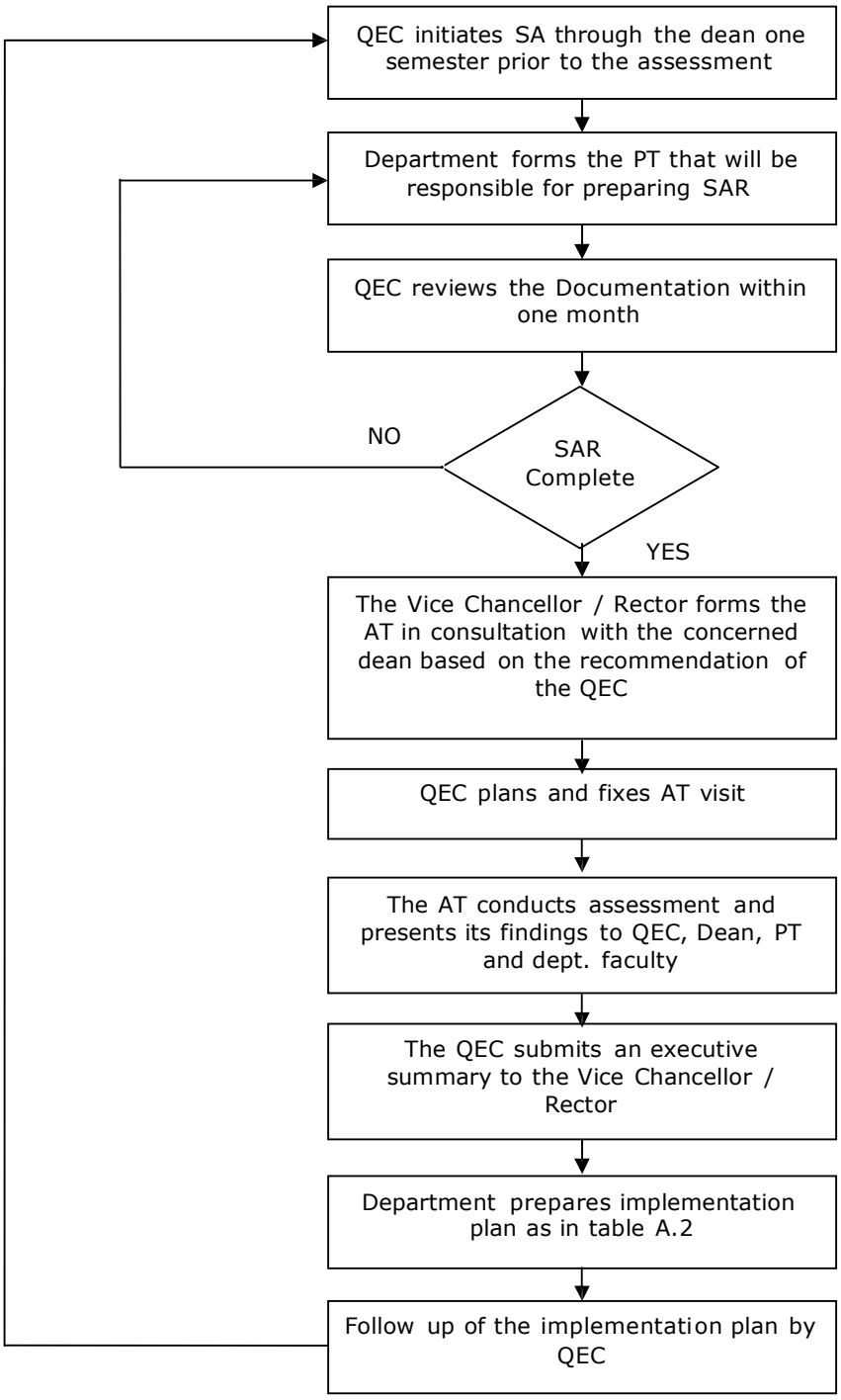


**Figure – 1: Self Assessment Procedure**

**Legend**

- QEC: Quality Enhancement Cell
- PT: Program Team
- SA: Self Assessment
- SAR: Self Assessment Report
- AT: Assessment Team

## 4. CRITERIA

The self-assessment is based on several criteria. To meet each criterion a number of standards must be satisfied. This section describes each criterion and its associated standards.

### Criterion 1: PROGRAM MISSION, OBJECTIVES AND OUTCOMES

Each program must have a mission, measurable objectives and expected outcomes for graduates. Outcomes include competency and tasks graduates are expected to perform after completing the program. A strategic plan must be in place to achieve the program objectives. The extent to which these objectives are achieved through continuous assessment and improvements must be demonstrated.

**Standard 1-1: The program must have documented measurable objectives that support Faculty / College and institution mission statements.**

- Document institution, college and program mission statements

> (Example: Mission Statement of University/Institute)
>
> 'To develop human resources by inculcating professional knowledge, skills and ethical values, to bring-in prosperity and technological advancement based on high-tech. research in the individual's life and society at large.'

- State program objectives. Program educational objectives are intended to be statements that describe the expected accomplishments of graduates during the first several years following graduation from the program.

> (Example: Mission Statement of Program)
>
> BS in Engineering Programs
>
> 'To build concrete concepts of the subject through high quality class teaching, laboratory work and small-scale research work, to help individuals become change agents on the canvas of technology advancement and innovation.'
>
> Program Objectives:
>
> 1. To enable the graduate to apply knowledge gained in the degree program effectively and efficiently.
> 2. To successfully bring innovation in related technology with cost-effectiveness.
> 3. To step into Research and Development (R&D) effectively.
> 4. To pursue higher studies in any international University of high repute.
> 5. To breakaway from maintenance-based job and step into designing and manufacturing.

- Describe how each objective is aligned with program, college and institution mission statements.

(Example: Main elements of the strategic plan to achieve program mission and objectives)

1. Curriculum design: Core subjects, Elective subjects. A wide variety of elective subjects are offered which brings diversity in the program. It also includes provision of areas of specialization.
2. Concept building through extensive laboratory work, applying theoretical knowledge.
3. Small-scale practical projects compatible with contemporary technological advancements throughout the degree program, and one practical Project in the final semester; which may become basis for winning a good job.
4. Compulsory summer internships to give hands-on experience to students. Internships are arranged by the University.
5. Co-curricular activities like academic clubs, participating in national and international competitions and exhibitions.

- Outline the main elements of the strategic plan to achieve the program mission and objectives.
- Provide for each objective how it was measured, when it was measured and improvements identified and made. Table 4.1 provides a format for program objectives assessment.

| Objective | How measured | When measured | Improvement identified | Improvement made |
|---|---|---|---|---|
| **1.** | *Appendix (C) | | | |
| **2.** | - do - | | | |
| **3.** | - do - | | | |
| **4.** | - do - | | | |
| **5.** | - do - | | | |

**Table 4.1: Program objectives assessment**

* Using Questionnaire provided in Appendix C

**<u>Standard 1-2:</u> The program must have documented outcomes for graduating students. It must be demonstrated that the outcomes support the program objectives and that graduating students are capable of performing these outcomes.**

- Describe how the program outcomes support the program objectives. In Table 4.2 show the outcomes that are aligned with each objective. A sample of such a table is shown in Appendix D

| Program Objectives | Program Outcomes | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |

**Table 4.2: Outcomes versus objectives**

- Describe the means for assessing the extent to which graduates are performing the stated program outcomes/learning objectives. This should be accomplished by the following:

  1. Conducting a survey of graduating seniors every semester.
  2. Conduct a survey of alumni every two years.
  3. Conduct a survey of employers every two years.
  4. Carefully designed questions asked during senior projects presentations. These questions should be related to program outcomes.
  5. Outcomes examinations

  A sample of the forms for such surveys is given in Appendix C. The data obtained from the above sources should be analyzed and presented in the assessment report.

  It is recommended that the above surveys should be conducted, summarized and added to the self-study assessment report. Departments should utilize the results of the surveys for improving the program as soon as they are available. An example follows:

## EXAMPLE (Program Objectives – Program Outcomes)

An example of program objectives and program outcomes is given below.

## PROGARM OBJECTIVES (as developed by the department)

1. **Foundation**
2. **Skills and Tools**
3. **Awareness and Professional Ethics**

### Objective 1

To provide students with a strong foundation in engineering sciences and design methodologies that emphasizes the application of the fundamental mathematical, scientific and engineering principles in the areas of engineering.

### Objective 2

To provide students with skills to enter the workplace well-prepared in the core competencies listed below:

a. Design and modeling experience
b. Open-ended problem solving ability
c. Experimental and data analysis techniques
d. Teamwork experience
e. Oral written and multimedia communication skills
f. Experience with contemporary computing systems and methodology

### Objective 3

To provide students with knowledge relevant to engineering practice, including ethical, professional, social and global awareness, the impact of engineering on society, the importance of
continuing education and lifelong learning in both technical and non-technical areas.

**PROGRAM OUTCOMES (as developed by the department)**

Degree of skills and capabilities that will reflect on their performance as engineers:

1. Students shall have an ability to apply knowledge of mathematics science and fundamental engineering to mechanical engineering problems.

2. Students shall have an ability to identify, formulate and solve practical engineering problems.

3. Students shall have an ability to design components, processes and systems to meet desired needs.

4. Students shall have an ability to conduct engineering experiments to study different engineering systems, including various modes of operation, performance evaluation, properties of materials and manufacturing techniques, as well as to use laboratory instruments and computers to analyze and interpret data.
5. Students shall have an ability to use modern tools, techniques, and skills necessary for practicing mechanical engineering including computational tools, statistical techniques, and instrumentation.

6. Students shall have an ability to work in a professional engineering environment, and to understand the associated economical considerations.

7. Students shall have an ability to communicate effectively in written, oral, and graphical forms, including the use of professional quality visual aids.

8. Students shall have an ability to work effectively in teams including multidisciplinary teams to solve engineering problems relevant to their field.

9. Students shall have an understanding of the professional and ethical responsibilities of engineers.

10. Students shall have an understanding of the impact of engineering on society and environment.

11. Students shall have recognition of the need and an ability to engage in life long learning of engineering.

The program outcomes are the by products of the program objectives and are interrelated. An example of interrelation between the program objectives and the program outcomes is shown in the following table.

| Program Objectives | Program Outcomes | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 1 | | | | | | | | | | | |
| 2a | | | | | | | | | | | |
| 2b | | | | | | | | | | | |
| 2c | | | | | | | | | | | |
| 2d | | | | | | | | | | | |
| 2e | | | | | | | | | | | |
| 2f | | | | | | | | | | | |
| 3 | | | | | | | | | | | |

**Relationship between Program Objectives and Program Outcomes**

**Legend**

Denotes substantial contribution to the objective and denotes moderate contribution to the objective. ▪ Denotes no contribution to the objective.

**Standard 1-3: The results of program's assessment and the extent to which they are used to improve the program must be documented.**

- Describe the actions taken based on the results of periodic assessments.
- Describe major future program improvements plans based on recent assessments.
- List strengths and weaknesses of the program
- List significant future development plans for the program.

**Standard 1-4: The department must assess its overall performance periodically using quantifiable measures.**

- Present students enrolment (undergraduate and graduate) during the last three years indicating percentages of honor students, student faculty ratio, average graduating grade point average per semester, average time for completing the undergraduate program and attrition rate.
- Indicate percentage of employers that are strongly satisfied with the performance of the department's graduates. Use employer's survey.
- Indicate the median/average student evaluation for all courses and the % of faculty awarded excellence in teaching award.
- Present performance measures for research activities. These include journal publications, funded projects, and conference publications per faculty per year and indicate the % of faculty awarded excellence in research award.
- Present performance measures for community services. This may include number of short courses per year, workshops and seminars organized.

- Indicate faculty and students satisfaction regarding the administrative services offered by the department. Use faculty and students surveys.

## Criterion 2: CURRICULUM DESIGN AND ORGANIZATION

The curriculum must be designed and organized to achieve the program's objectives and outcomes. Also course objectives must be in line with program outcomes. The breakdown of the curriculum must satisfy the standards specified in this section. Curriculum standards are specified in terms of credit hours of study. A semester credit hour equals one class hour or two to three laboratory hours per week. The semester is approximately fifteen weeks.

Provide the following information about the program's curriculum:

A. Title of degree program.

B. Definition of credit hour.

C. Degree plan: attach a flow-chart showing the prerequisites, core, and elective courses.

D. Complete Table 4.3 showing curriculum breakdown in terms of mathematics and basic sciences, major requirements, social sciences and other requirements.

E. For each course in the program that can be counted for credit provide 1-2 pages specifying the following:

- Course title
- Course objectives and outcomes
- Catalog description
- Text book(s) and references
- Syllabus breakdown in lectures
- Computer usage
- Laboratory
- Content breakdown in credit hours (if applicable) as basic science, math, engineering science, and design for engineering discipline, general education requirements, business requirements and major requirements for the Business Studies and others.

| Semester | Course Number | Category (Credit Hours) | | | | |
|---|---|---|---|---|---|---|
| | | Math and Basic Science | | Core Courses | Humanities and Social Sciences | Technical Electives |
| | | Math | Basic Science | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| **Total** | | | | | | |
| **Minimum Requirements** | | | | | | |

**Table 4.3: Curriculum course requirements**

**<u>Standard 2-1</u>: The curriculum must be consistent and supports the program's documented objectives.**

- Describe how the program content (courses) meets the program objectives
- Complete the matrix shown in Table 4.4 linking courses to program outcomes. List the courses and tick against relevant outcomes. A sample of such a matrix is shown in Appendix D.

| Courses/Groups of Courses | Objectives | | | | |
|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 |
| 1 | | | | | |
| 2 | | | | | |
| 3 | | | | | |

**Table 4.4: Courses versus program outcomes**

**Standard 2-2: Theoretical background, problems analysis and solution design must be stressed within the program's core material.**

- Indicate which courses contain a significant portion (more than 30%) of the elements in standard 2-2.

| Elements | Courses |
|---|---|
| Theoretical background | |
| Problem analysis | |
| Solution design | |

**Table 4.5: Standard 2-2 requirement**

**Standard 2-3: The curriculum must satisfy the core requirements for the program, as specified by the respective accreditation body. Examples of such requirements are given in Table A.1,** Appendix A.

**Standard 2-4: The curriculum must satisfy the major requirements for the program as specified by HEC, the respective accreditation body / councils. Examples of such requirements are given in Table A.1,** Appendix A.

**Standard 2-5: The curriculum must satisfy general education, arts, and professional and other discipline requirements for the program, as specified by the respective accreditation body / council. Examples of such requirements are given in Table A.1,** Appendix A.

- Address standards 2-3, 2-4 and 2-5 using information provided in Table 4.4.

**Standard 2-6: Information technology component of the curriculum must be integrated throughout the program.**

- Indicate the courses within the program that will satisfy the standard.
- Describe how they are applied and integrated through out the program.

**Standard 2-7: Oral and written communication skills of the student must be developed and applied in the program.**

- Indicate the courses within the program that will satisfy the standard.
- Describe how they are applied.

## Criterion 3: LABORATORIES AND COMPUTING FACILITIES

Laboratories and computing facilities must be adequately available and accessible to faculty members and students to support teaching and research activities. To meet this criterion the standards in this section must be satisfied. In addition departments may benchmark with similar departments in reputable institutions to identify their shortcomings if any.

Provide the following information about the laboratories and computing facilities:

Describe the laboratory/ computer facilities that are available for use in the program under assessment. Indicate for each lab the following

- Laboratory Title
- Location and area
- Objectives
- Adequacy for instruction
- Courses taught
- Software available if applicable
- Major Apparatus
- Major Equipment
- Safety regulations

### Standard 3-1: Laboratory manuals/documentation/instructio ns for experiments must be available and readily accessible to faculty and students.

- Explain how students and faculty have adequate and timely access to the manuals/documentation and instructions.
- Benchmark with similar departments in reputable institutions to identify short comings in laboratory.

### Standard 3-2: There must be adequate support personnel for instruction and maintaining the laboratories.

- Indicate for each laboratory, support personnel, level of support, nature and extent of instructional support

### Standard 3-3: The University computing infrastructure and facilities must be adequate to support program's objectives.

- Describe how the computing facilities support the computing component of your program.
- Benchmark with similar departments in reputable institutions to identify short comings in computing infrastructure and facilities if any.

## Criterion 4: STUDENT SUPPORT AND ADVISING

Student must have adequate support to complete the program in a timely manner and must have ample opportunity to interact with their instructors and receive timely advice about program requirements and career alternatives. To meet this criterion the standards in this section must be satisfied.

**Standard 4-1: Courses must be offered with sufficient frequency and number for students to complete the program in a timely manner.**

- Provide the department's strategy for course offerings.
- Explain how often required courses are offered.
- Explain how often elective courses are offered.
- Explain how required courses outside the department are managed to be offered in sufficient number and frequency.

**Standard 4-2: Courses in the major area of study must be structured to ensure effective interaction between students, faculty and teaching assistants.**

- Describe how you achieve effective student / faculty interaction in courses taught by more than one person such as two faculty members, a faculty member and a teaching assistant or a lecturer.

**Standard 4-3: Guidance on how to complete the program must be available to all students and access to academic advising must be available to make course decisions and career choices.**

- Describe how students are informed about program requirements.
- Describe the advising system and indicate how its effectiveness is measured.
- Describe the student counseling system and how students get professional counseling when needed.
- Indicate if students have access to professional counseling; when necessary.
- Describe opportunities available for students to interact with practitioners, and to have membership in technical and professional societies.

## Criterion 5: PROCESS CONTROL

The processes by which major functions are delivered must be in place, controlled, periodically reviewed, evaluated and continuously improved. To meet this criterion a set of standards must be satisfied.

**Standard 5-1: The process by which students are admitted to the program must be based on quantitative and qualitative criteria and clearly documented.**

**This process must be periodically evaluated to ensure that it is meeting its objectives.**

- Describe the program admission criteria at the institutional level, faculty or department if applicable.
- Describe policy regarding program/credit transfer.
- Indicate how frequently the admission criteria are evaluated and if the evaluation results are used to improve the process.

**Standard 5-2: The process by which students are registered in the program and monitoring of students progress to ensure timely completion of the program must be documented This process must be periodically evaluated to ensure that it is meeting its objectives.**

- Describe how students are registered in the program.
- Describe how students' academic progress is monitored and how their program of study is verified to adhere to the degree requirements.
- Indicate how frequently the process of registration and monitoring are evaluated and if the evaluation results are used to improve the process.

**Standard 5-3: The process of recruiting and retaining highly qualified faculty members must be in place and clearly documented. Also processes and procedures for faculty evaluation, promotion must be consistent with institution mission statement. These processes must be periodically evaluated to ensure that it is meeting with its objectives.**

- Describe the process used to ensure that highly qualified faculty is recruited to the program.
- Indicate methods used to retain excellent faculty members.
- Indicate how evaluation and promotion processes are in line with institution mission statement.
- Indicate how frequently this process in evaluated and if the evaluation results are used to improve the process.

**Standard 5-4: The process and procedures used to ensure that teaching and delivery of course material to the students emphasizes active learning and that course learning outcomes are met. The process must be periodically evaluated to ensure that it is meeting its objectives.**

- Describe the process and procedures used to ensure that teaching and delivery of course material is effective and focus on students learning.
- Indicate how frequently this process is evaluated and if the evaluation results are used to improve the process.

**Standard 5-5: The process that ensures that graduates have completed the requirements of the program must be based on standards, effective and clearly documented procedures. This process must be periodically evaluated to ensure that it is meeting its objectives.**

- Describe the procedures used to ensure that graduates meet the program requirements.
- Describe when this procedure is evaluated and whether the results of this evaluation are used to improve the process

## Criterion 6: FACULTY

Faculty members must be current and active in their discipline and have the necessary technical depth and breadth to support the program. There must be enough faculty members to provide continuity and stability, to cover the curriculum adequately and effectively, and to allow for scholarly activities. To meet this criterion the standards in this section must be satisfied.

**Standard 6-1: There must be enough full time faculty who are committed to the program to provide adequate coverage of the program areas/courses with continuity and stability. The interests and qualifications of all faculty members must be sufficient to teach all courses, plan, modify and update courses and curricula. All faculty members must have a level of competence that would normally be obtained through graduate work in the discipline. The majority of the faculty must hold a Ph.D. in the discipline.**

- Complete the following table indicating program areas and number of faculty in each area.
- Each faculty member should complete a resume, prepared in a format included in Appendix B.
- Information recorded in Table 4.6 and faculty member's resumes will be sufficient to validate standard 6-1.

| Program area of specialization | Courses in the area and average number of sections per year | Number of faculty members in each area | Number of faculty with Ph.D. degree |
|---|---|---|---|
| Area 1. | | | |
| Area 2. | | | |
| Area 3. | | | |
| Area 4. | | | |
| **Total** | | | |

**Table 4.6: Faculty distribution by program areas**

**Standard 6-2: All faculty members must remain current in the discipline and sufficient time must be provided for scholarly activities and professional development. Also, effective programs for faculty development must be in place.**

- Describe the criteria for faculty to be deemed current in the discipline and based on these criteria and information in the faculty member's resumes, what percentage of them is current. The criteria should be developed by the department.
- Describe the means for ensuring that full time faculty members have sufficient time for scholarly and professional development.
- Describe existing faculty development programs at the departmental and university level.

  Demonstrate their effectiveness in achieving faculty development.
- Indicate how frequently faculty programs are evaluated and if the evaluation results are used for improvement.

**Standard 6-3: All faculty members should be motivated and have job satisfaction to excel in their profession.**

- Describe programs and processes in place for faculty motivation.
- Obtain faculty input using faculty survey (Appendix C) on programs for faculty motivation and job satisfaction.
- Indicate how effective these programs are.

## Criterion 7: INSTITUTIONAL FACILITIES

Institutional facilities, including library, classrooms and offices must be adequate to support the objective of the program. To satisfy this criterion a number of standards must be met.

**Standard 7-1: The institution must have the infrastructure to support new trends in learning such as e-learning.**

- Describe infrastructure and facilities that support new trends in learning.
- Indicate how adequate the facilities are.

**Standard 7-2: The library must possess an up-to-date technical collection relevant to the program and must be adequately staffed with professional personnel.**

- Describe the adequacy of the library's technical collection.
- Describe the support rendered by the library.

**Standard 7-3: Class-rooms must be adequately equipped and offices must be adequate to enable faculty to carry out their responsibilities.**

- Describe the adequacy of the classrooms.
- Describe the adequacy of faculty offices

## Criterion 8: INSTITUTIONAL SUPPORT

The institution's support and the financial resources for the program must be sufficient to provide an environment in which the program can achieve its objectives and retain its strength.

**Standard 8-1: There must be sufficient support and financial resources to attract and retain high quality faculty and provide the means for them to maintain competence as teachers and scholars.**

- Describe how your program meets this standard. If it does not explain the main causes and plans to rectify the situation.
- Describe the level of adequacy of secretarial support, technical staff and office equipment.

**Standard 8-2: There must be an adequate number of high quality graduate students, research assistants and Ph.D. students.**

- Provide the number of graduate students, research assistants and Ph. D students for the last three years.
- Provide the faculty: graduate student ratio for the last three years.

**Standard 8-3: Financial resources must be provided to acquire and maintain Library holdings, laboratories and computing facilities.**

- Describe the resources available for the library.
- Describe the resources available for laboratories.
- Describe the resources available for computing facilities.

# APPENDICES

# Appendix A

# Academic Requirements and Implementation Plan

**Table A.1 Minimum Requirements for Each Program**
(Program Semester Credit hours)

| Program | Math & Basic Science | Engineering Topics | General Education | Others |
|---|---|---|---|---|
| | | | | |
| | | | | |

- HEC requirements
- Program Requirements
- Deviations
- Justifications for Deviations

**Table A.2 Assessment Results Implementation Plan Summary**

| AT Finding | Corrective Action | Implementation Date | Responsible Body | Resources Needed |
|---|---|---|---|---|
| 1. | | | | |
| 2. | | | | |
| 3. | | | | |
| 4. | | | | |
| 5. | | | | |
| 7. | | | | |
| 8. | | | | |
| Chairman's Comments<br><br>Name and Signature | | | | |
| Dean's Comments<br><br>Name and Signature | | | | |
| QEC Comments<br><br>Name and Signature | | | | |

# Appendix B

## Format of Faculty Members' Resume

## Faculty Resume

| | |
|---|---|
| Name: | _____ |
| Personal: | May include address(s) and phone number(s) and other personal information that the candidate feels is pertinent. |
| Experience | List current appointment first, each entry as follows: Date, Title, and Institution. |
| Honors and Awards | List honors or awards for scholarship or professional activity |
| Memberships | List memberships in professional and learned societies, indicating offices held, committees, or other specific assignments. |
| Graduate Students<br>Postdocs<br>Undergraduate Students<br>Honor Students | List supervision of graduate students, postdocs and undergraduate honors theses showing:<br>**Years Degree Name**<br><br>Show other information as appropriate and list membership on graduate degree committees. |
| Service Activity | List University and public service activities. |
| Brief Statement of Research Interest | May be as brief as a sentence or contain additional details up to one page in length. |
| Publications | List publications in standard bibliographic format with earliest date first.<br>▪ Manuscripts accepted for publication should be included under appropriate category as "in press;"<br>▪ Segment the list under the following standard headings:<br>. Articles published by refereed journals.<br>. Books<br>. Scholarly and / or creative activity published through a refereed electronic venue.<br>. Contribution to edited volumes.<br>. Papers published in refereed conference proceedings.<br>. Papers or extended abstracts published in conference proceedings. (refereed on the basis of abstract) |

| | |
|---|---|
| | . Articles published in popular press.<br>. Articles appearing in in-house organs.<br>. Research reports submitted to sponsors.<br>. Articles published in non – refereed journals.<br>. Manuscripts submitted for publication. (include where and when submitted) |
| Research Grants and Contracts | Entries should include:<br>**Date Title Agency / Organization Total Award Amount**<br><br>Segment the list under following headings:<br>▪ Completed<br>▪ Funded and in progress<br>▪ In review |
| Other Research or Creative Accomplishments | List patents, software, new products developed, etc. |
| Selected Professional Presentations | |

# Appendix C

## Samples of Survey Forms

*(Each department can modify the forms to suit its program outcomes)*

## Employer Survey

The purpose of this survey is to obtain employers' input on the quality of education the university (name of the university) is providing and to assess the quality of the academic program. The survey is with regard to the university graduates employed at your organization. We seek your help in completing this survey.

A: Excellent B: Very good C: Good D: Fair E: Poor

| | | | | | | |
|---|---|---|---|---|---|---|
| **I** | *** Knowledge** | | | | | |
| | **1.** | Math, Science and Engineering Skills | (A) | (B) | (C) | (D) (E) |
| | **2.** | Problem formulation and solving skills | (A) | (B) | (C) | (D) (E) |
| | **3.** | Collecting and analyzing appropriate data | (A) | (B) | (C) | (D) (E) |
| | **4.** | Ability to link theory to Practice | (A) | (B) | (C) | (D) (E) |
| | **5.** | Ability to design a system component or process | (A) | (B) | (C) | (D) (E) |
| | **6.** | Computer knowledge | (A) | (B) | (C) | (D) (E) |
| **II.** | **Communication Skills** | | | | | |
| | **1.** | Oral communication | (A) | (B) | (C) | (D) (E) |
| | **2.** | Report writing | (A) | (B) | (C) | (D) (E) |
| | **3.** | Presentation skills | (A) | (B) | (C) | (D) (E) |
| **III** | **Interpersonal Skills** | | | | | |
| | **1.** | Ability to work in teams | (A) | (B) | (C) | (D) (E) |
| | **2.** | Leadership | (A) | (B) | (C) | (D) (E) |
| | **3.** | Independent thinking | (A) | (B) | (C) | (D) (E) |
| | **4.** | Motivation | (A) | (B) | (C) | (D) (E) |
| | **5.** | Reliability | (A) | (B) | (C) | (D) (E) |
| | **6.** | Appreciation of ethical values | (A) | (B) | (C) | (D) (E) |
| **IV** | **Work Skills** | | | | | |
| | 1. | Time management skills | (A) | (B) | (C) | (D) (E) |
| | 2. | Judgment | (A) | (B) | (C) | (D) (E) |
| | 3. | Discipline | (A) | (B) | (C) | (D) (E) |

* Can be modified to suit the particulars of the discipline

## V General Comments

Please make any additional comments or suggestions, which you think would help strengthen our programs for the preparation of graduates who will enter your field. Did you know as to what to expect from graduates?

_____
_____
_____
_____
_____

## VI Information About Organization

1. Organization Name ----------

2. Type of Business ----------

3. Number of Graduates (specify the program) in your Organization:

## Alumni Survey

The purpose of this survey is to obtain alumni input on the quality of education they received and the level of preparation they had at the university (name of the university). The purpose of this survey is to assess the quality of the academic program. We seek your help in completing this survey.

A : Excellent B: Very good C: Good D: Fair E: Poor

**I Knowledge**

| | | | | | |
|---|---|---|---|---|---|
| 1. Math, Science and Engineering Skills | (A) | (B) | (C) | (D) | (E) |
| 2. Problem formulation and solving skills | (A) | (B) | (C) | (D) | (E) |
| 3. Collecting and analyzing appropriate data | (A) | (B) | (C) | (D) | (E) |
| 4. Ability to link theory to practice | (A) | (B) | (C) | (D) | (E) |
| 5. Ability to design a system component or process | (A) | (B) | (C) | (D) | (E) |
| 6. Computer knowledge | (A) | (B) | (C) | (D) | (E) |

**II Communication Skills**

| | | | | | |
|---|---|---|---|---|---|
| 1. Oral communication | (A) | (B) | (C) | (D) | (E) |
| 2. Report writing | (A) | (B) | (C) | (D) | (E) |
| 3. Presentation skills | (A) | (B) | (C) | (D) | (E) |

**III Interpersonal Skills**

| | | | | | |
|---|---|---|---|---|---|
| 1. Ability to work in teams | (A) | (B) | (C) | (D) | (E) |
| 2. Independent thinking | (A) | (B) | (C) | (D) | (E) |
| 3. Appreciation of ethical values | (A) | (B) | (C) | (D) | (E) |
| 4. Professional development | (A) | (B) | (C) | (D) | (E) |

**IV Work Skills**

| | | | | | |
|---|---|---|---|---|---|
| 1. Time management skills | (A) | (B) | (C) | (D) | (E) |
| 2. Judgment | (A) | (B) | (C) | (D) | (E) |
| 3. Discipline | (A) | (B) | (C) | (D) | (E) |

## V General Comments

Please make any additional comments or suggestions, which you think would help strengthen our programs. (New courses that you would recommend and courses that you did not gain much from)

_____
_____
_____
_____
_____

## VI Alumni Information

1. Name (Optional) ----------
2. Name of organization—----------
3. Position in organization:----------
4. Year of graduation: ----------

## Survey of Graduating Students

The survey seeks graduating students' input on the quality of education they received in their program and the level of preparation they had at the university. The purpose of this survey is to assess the quality of the academic programs. We seek your help in completing this survey.

A : Strongly agree B: agree C: disagree D: Strongly disagree

1. The work in the program is too heavy and induces a lot of pressure.

   A B C D

2. The program is effective in enhancing team- working abilities.

   A B C D

3. The program administration is effective in supporting learning.

   A B C D

4. The program is effective in developing analytic and problem solving skills.

   A B C D

5. The program is effective in developing independent thinking.

   A B C D

6. The program is effective in developing written communication skills.

   A B C D

7. The program is effective in developing planning abilities.

   A B C D

8. The mathematical content of the program is adequate for pursuing the advanced courses in the program.

   A B C D

**Answer question 9 if applicable.**

9. The internship experience is effective in enhancing:

| | | | | | |
|---|---|---|---|---|---|
| a. Ability to work in teams | (A) | (B) | (C) | (D) | (E) |
| b. Independent thinking | (A) | (B) | (C) | (D) | (E) |
| c. Appreciation of ethical values | (A) | (B) | (C) | (D) | (E) |
| d. Professional development | (A) | (B) | (C) | (D) | (E) |
| e. Time management skills | (A) | (B) | (C) | (D) | (E) |
| f Judgment | (A) | (B) | (C) | (D) | (E) |
| g. Discipline | (A) | (B) | (C) | (D) | (E) |
| h. The link between theory and practice. | (A) | (B) | (C) | (D) | (E) |

10 What are the best aspects of your program?

11 What aspects of your program could be improved?

You may use additional sheets for questions 10 & 11 if needed

## Faculty Survey

The purpose of this survey is to assess faculty members, satisfaction level and the effectiveness of programs in place to help them progress and excel in their profession. We seek your help in completing this survey and the information provided will be kept in confidence. **Indicate how satisfied are you with each of the following aspects of you situation at your department?**

A: Very satisfied B: Satisfied C: Neutral D: dissatisfied E: Very dissatisfied

1. Your mix of research, teaching and community service

   A B C D E

2. The intellectual stimulation of your work.

   A B C D E

3. Type of teaching/research you currently do.

   A B C D E

4. Your interaction with students.

   A B C D E

5. Cooperation you receive from colleagues

   A B C D E

6. The mentoring available to you.

   A B C D E

7. Administrative support from the department

   A B C D E

8. Providing clarity about the faculty promotion process.

   A B C D E

9. Your prospects for advancement and progress through ranks.

   A B C D E

10. Salary and compensation package.

    A B C D E

11. Job security and stability at the department.

A B C D E

12. Amount of time you have for yourself and family.

A B C D E

13. The over all climate at the department.

A B C D E

14. What are the best programs/factors currently available in your department that enhance your motivation and job satisfaction?

15. Suggest programs/factors that could improve your motivation and job satisfaction?

**Information about faculty member.**

1. Academic rank:

A: Professor B: Associate Prof. C: Assistant. Professor

D: Instructor E: Lecturer

2. Years of service (in years):

A: 1-5 B: 6-10 C: 11-15

D: 16-20 E: > 20

# Appendix D

## Samples of Objectives, outcomes and courses matrices

## Sample of a Matrix Relating Program Outcomes to Program Objectives

Program Title:

| Program learning outcomes | Program objectives | | | | |
|---|---|---|---|---|---|
| | **Skills in critical thinking, problem solving and communication** | **Initiate and manage change** | **Understand professional ethics and responsibility** | **Employ I. S. Technology** | **Enable organizations to make optimal decision** |
| | x | | | x | x |
| | x | | | | x |
| | | x | | x | x |
| | | | | | x |
| | x | x | | | |
| Use up to date tools | | | | x | x |
| Life long learning | x | | x | x | |
| Professional ethics and responsibility | x | | x | | |

Notes:-

1. Knowledge, understanding, skills and other attributes a student is required to have developed on completing the program be included under Program Learning Outcomes.
2. Program objectives as achieved by the students on completing the program are to be shown by marking 'x'.

# Appendix E

## Quality Enhancement Cell: A Typical Organizational Setup
## QEC Functions

## Quality Enhancement Cell

1. The Quality Enhancement Cell (QEC) is to be headed by a Dean reporting directly to Vice Chancellor/Rector. He is to be the correspondent with the outside bodies.

2. QEC is responsible for promoting public confidence that the quality and standards of the award of degrees are enhanced and safeguarded.

3. QEC is responsible for the review of quality standards and the quality of teaching and learning in each subject area.

4. QEC is responsible for the review of academic affiliations with other institutions in terms of effective management of standards and quality of programs.

5. QEC is responsible for defining clear and explicit standards as points of reference to the reviews to be carried out. It should also help the employees to know as to what they could expect from candidates.

6. QEC is responsible to develop qualifications framework by setting out the attributes and abilities that can be expected from the holder of a qualification, i.e. Bachelors, Bachelor with Honors, Master's, M. Phil., Doctoral.

7. QEC is responsible to develop program specifications. These are standard set of information clarifying what knowledge, understanding, skills and other attributes a student will have developed on successfully completing a specific program.

8. QEC is responsible to develop quality assurance processes and methods of evaluation to affirm that the quality of provision and the standard of awards are being maintained and to foster curriculum, subject and staff development, together with research and other scholarly activities.

9. QEC is responsible to ensure that the university's quality assurance procedures are designed to fit in with the arrangements in place nationally for maintaining and improving the quality of Higher Education.

10. QEC is responsible to develop procedures for the following:
    - Approval of new programs
    - Annual monitoring and evaluation including program monitoring, faculty monitoring, and student's perception.
    - Departmental review
    - Student feedback
    - Employer feedback
    - Quality assurance of Master's, M. Phil. And Ph. D. degree programs.
    - Subject review
    - Institutional assessment
    - Program specifications
    - Qualification framework