NCEAC ACCREDITATION STANDARDS AND CRITERIA

by
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PRE-AMBLE

The writing Self Assessment Report (SAR) or in other words Submission of Accreditation Application, knowledge of NCEAC Standards & Criteria and filling of the Criteria Verification Form (CVF) are intertwined.

Sequence of Action

1. The Institute submits the required data on-line through NCEAC Accreditation Automation System (AAS).
2. AAS generates a SAR for the Institute. The Institute is then able to submit Accreditation Application by click of a button.
3. After desk audit, a team of program evaluators (PEs) is sent to the Institute which carries out physical verification of the data submitted in the SAR.
4. Team fills the CVF on-line by assigning compliance level to each sub-criterion of the nine criteria.

PRESENTATION SUMMARY

- Introducing NCEAC Standards and Criteria.
- Introducing the new CVF.
- Introducing NCEAC Accreditation Automation System (AAS) facilitating completion of SAR and application submission.

BENEFIT TO THE INSTITUTE

This presentation will provide guidance to Institutes offering Computing degrees in implementing quality programs.

Quality in this statement implies that:

- All academic activities being practiced are documented; and
- All activities which are documented are practiced.

QUALITY?

- Actual quality lies in the heart of the teacher, the kingpin of all academic activities.
- As we are guided by our deen, we learn that deeds of worship in their definitive form are the expression of an inner state.
- Rasool Allah (sallalahu alaihi wa sallam) has clearly stated that “taqwa is a thing of the heart.”
- This finds expression in a hadith. Once Rasool Allah (sallalahu alaihi wa sallam) observed pointing to his heart, ‘The fear of Allah lies here,’ (At Taqwa ha huna) (Bukhari).
- Our Beliefs have a profound effect upon our actions.

INTRODUCTION

- A comprehensive set of standards have been developed by NCEAC to facilitate institutes to improve the quality of the computing degree programs.

- The strengths, weaknesses, and concerns of the program regarding these standards are identified during the accreditation process.

- Each standard is evaluated based on various requirements. The Council expects that each accredited program must fulfil all these requirements as per its standards.

ACCREDITATION CRITERIA

- Criterion-1: Program Objectives (POs)
- Criterion-2: Graduate Attributes (GAs)
- Criterion-3: Curriculum and Learning Process
- Criterion-4: Students
- Criterion-5: Faculty and Support Staff
- Criterion-6: Facilities and Infrastructure
- Criterion-7: Institutional Support and Financial Resources
- Criterion-8: Steps to Improve the Program
- Criterion-9: Industrial Linkages

CRITERION 1

PROGRAM OBJECTIVES (POs)

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The program seeking accreditation must demonstrate that the following are in place:

- Well-defined and published Program Objectives.
- Program’s objectives consistency with the Institute’s mission and based on the stakeholder’s needs.
- A process in place to evaluate the attainment of program objectives.
- Evaluation results used for improvement of the program.

WHAT ARE PROGRAM OBJECTIVES?

- These are English Language statements stating the reason of initiating the program. The reason would naturally be aligned with the mission of the institute and based on the needs of the stake holders.

- Who are the stake holders?
  - Public (students and their parents)
  - Faculty, and the
  - National requirements (industry).

STAKE HOLDERS' INVOLVEMENT IN FORMULATING POs

- Public:
  - Feedback from alumni few years (4 to 5 years) after graduation.
  - Feedback from industry employing the graduates.

  The feedback is in the form of an easy to respond questionnaire developed by the program to extract information about attainment of POs by its graduates.
- Faculty: Faculty continuously reviews the course contents being taught considering recommendations of the industry and alumni feedback.
- National Requirements (Industry): An Industry Advisory Board (IAB) is constituted by the department offering the program. IAB is kept in loop on the academic developments in the department through a meeting held once during a semester. Recommendations made by IAB are given due importance.

PROGRAM OBJECTIVES - A SAMPLE

It is expected that the objectives of the program (POs) may be three to four, for example:

- ***PO1:*** *To inculcate the ability in its students to continue enhancing their computing knowledge and skills after graduation and excel in their careers as researchers, professionals, and entrepreneurs.*

- ***PO2:*** *To groom its students to be effective, after graduation, in society and diverse professional environments maintaining high ethical standards.*

- ***PO3:*** *To groom its students to communicate effectively, demonstrate leadership qualities and professional integrity*.

Mission of the Program (An example)

- The mission of the program, for example, is:

"To disseminate computing education emphasizing entrepreneurship and ethical standards while encouraging the students to familiarize with latest developments in research, tools and processes and use their skills to identify and find solution to society's problem."

MAPPING OF POs TO MISSION

Mission	PO1	PO2	PO3
Teaching	√		
Research, innovation, and commercialization	√	√	√
National socio-economic development	√	√	√

TECHNIQUES FOR EVALUATING ATTAINMENT

INDIRECT ASSESSMENT METHODS

- Methods requiring inferring abilities, knowledge, and values by gathering information through surveys and exit interviews.

- These assessment methods provide ***perceptions*** of students, faculty, or other people (often alumni or employers) who are the stake holders.

DIRECT ASSESSMENT METHODS

- These are “measurement” strategies that require students to actively demonstrate achievement levels related to institutional and program-specific learning outcomes.
- They focus on collecting evidence on attainment directly from students in their assignments, exams, quiz, project, internship, portfolios etc. or
- By observing them as they demonstrate learned skills, practice or behaviour in the laboratory or class presentation.

DIRECT VERSUS INDIRECT ASSESSMENT

- Direct Methods are always our first choice.

Advantage of Direct Methods

  - Require students to actively demonstrate knowledge, attitudes, and/or skills
  - Provide data to directly measure expected outcomes
  - Demand less abstract interpretation
  - Usually “easier” to administer

- Indirect methods support but cannot replace direct methods.

ASSESSMENT/ MEASUREMENT OF POs ATTAINMENT

POs attainment can only be measured through indirect method. For this purpose, the following surveys are used:

- Alumni Survey; and
- Employer Survey.

DESIGNING SURVEY QUESTIONNAIRES

- Indirect easy to answer questions inferring achievement of POs.
- The questions to be answered, for example, by assigning letter grades “A” (Excellent), “B” (Good), “C” (Satisfactory), “D”(Poor) etc. or score out of some figure like 10 with higher score referring better attainment.

EVALUATION OF POs ATTAINMENT (ALUMNI SURVEY – An Example)

Questions	PO 1	PO 2	PO 3
Knowledge and Skills			
1. Adequately prepared for technical jobs?	√		
2. Received regular promotions/bonuses?	√		
3. Career confidence level?	√		
4. Received any advanced graduate degree?	√		
5. Attended any technical conferences?	√		
6. Participated in professional trainings?	√		
Solution to Society's Problems			
1. Participated in any community service?		√	
2. Member of a professional society?		√	
3. Volunteered for public good?		√	
Leadership and Integrity			
1. Mentored junior staff?			√
2. Dealt with cultural constraints ethically?			√
3. Consistency in ethical choices?			√

EVALUATION OF POs ATTAINMENT (EMPLOYERS SURVEY – An Example)

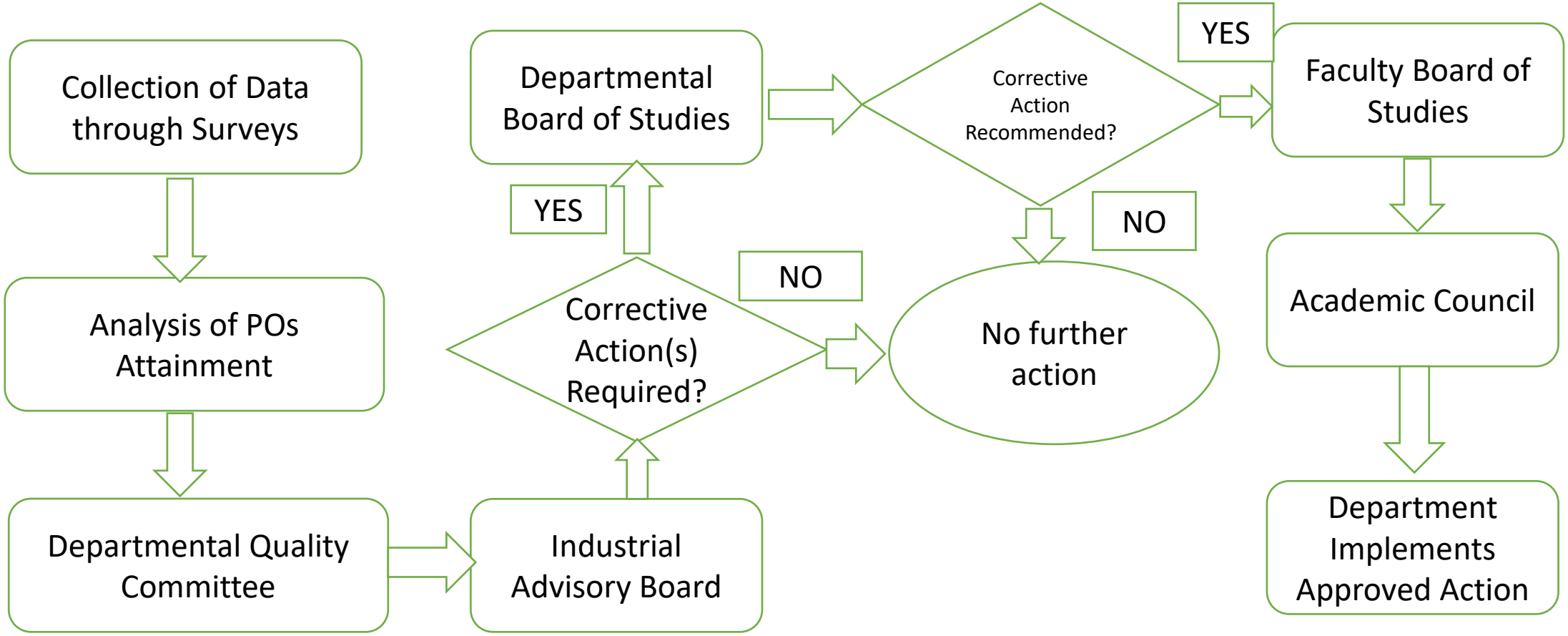
Questions	PO 1	PO 2	PO 3
Knowledge and Skills			
1. Performance in current job?	√		
2. Awarded with competitive rewards?	√		
3. Received regular promotions?	√		
4. Participated in professional training?	√		
5. Research & Development skills?	√		
6. Readiness for new technologies?	√		
Solution to Society's Problems			
1. Handling of cultural constraints in projects?		√	
2. Environment protection in workplace?		√	
3. Handling of safety issues in products?		√	
Leadership and Integrity			
1. Leading or active role in professional, technical, or volunteer societies?			√
2. Mentoring or training abilities?			√
3. Sense of responsibility in the team?			√

THRESHOLDS FOR DETERMINING ATTAINMENT – An Example

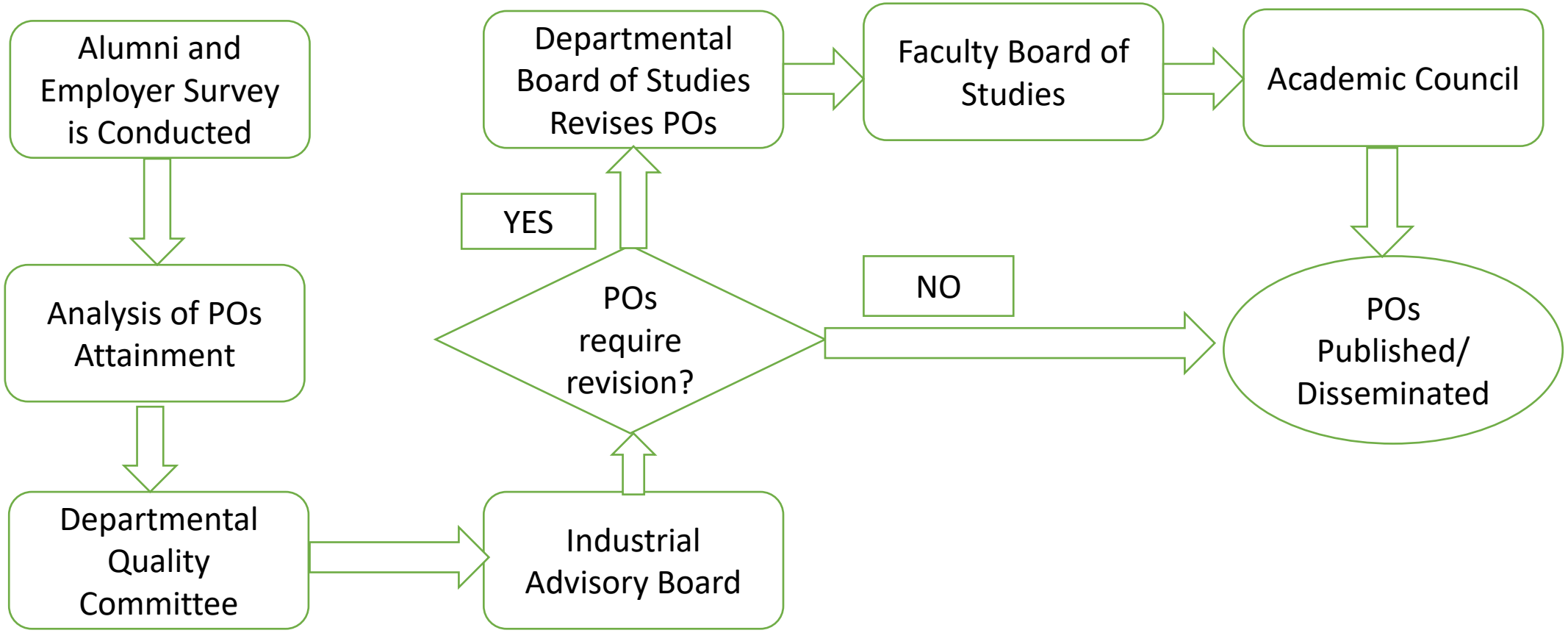
Thresholds for determining attainment are also called Key Performance Indicators (KPIs).

- For us to consider a PO to be attained by an alumnus, the alumnus and employer response must demonstrate that he/she has achieved the specific accomplishments that are relevant to that PO.
- In case letter grades are asked from the alumnus/ employer, percentage of the alumni grading themselves “C” or above out of the total alumni responses and percentage of employers grading alumni as “C” or above out of total employers responses is recorded.
- The Key Performance Indicator (KPI) for determining attainment of a PO may be, for example, 50% of the weighted mean of the two scores with 60% weight to alumnus response and 40% weight to employer response.

SELF IMPROVEMENT PROCESS BASED ON POs ATTAINMENT



ANNUAL POs REVIEW PROCESS BASED ON ATTAINMENT



CRITERION - 2

GRADUATE ATTRIBUTES (GAs)

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- Graduate attributes are statements that describe the set of skills, knowledge, and attitude that institute expects from its graduates.
- The institute monitors its own performance from the data gathered while evaluating the attainment of GAs by its graduates.
- By virtue of this data the institute assesses the quality of its graduates and takes steps to carry out necessary improvements in weak areas that are affecting better attainment of GAs.
- GAs defined by NCEAC are in alignment with the Graduate Attributes laid down in the Seoul Accord document D.5 for computing professionals.

Definitions Associated with the Graduate Attributes

- The **practice area** of a computing professional is defined both by the area of computing knowledge and skills, and by the nature of the activities performed.

- A **computing problem** is one that can be solved by the application of computing knowledge, skills, and generic competencies.

- **Solution** means an effective proposal for resolving a problem, taking into account all relevant technical, legal, social, cultural, economic, and environmental issues and respecting the need for sustainability.

Range of Problem Solving

	Characteristic	A **Complex Computing Problem** is a computing problem having some or all the following characteristics:
1	Range of conflicting requirements	Involves wide-ranging or conflicting technical, computing, and other issues
2	Depth of analysis required	Has no obvious solution, and requires conceptual thinking and innovative analysis to formulate suitable abstract models

Range of Problem Solving (Cont'd)

3	Depth of knowledge required	A solution requires the use of in-depth computing or domain knowledge and an analytical approach that is based on well-founded principles
4	Familiarity of issues	Involves infrequently encountered issues
5	Level of problem	Is outside problems encompassed by standards and standard practice for professional computing
6	Extent of stakeholder involvement and level of conflicting requirements	Involves diverse groups of stakeholders with widely varying needs

Range of Problem Solving (Cont'd)

7	Consequences	Has significant consequences in a range of contexts
8	Interdependence	Is a high-level problem possibly including many component parts or subproblems
9	Requirement identification	Identification of a requirement or the cause of a problem is ill defined or unknown

Range of Computing Activity

	Characteristic	A **Complex Computing Activity** is a computing activity or project that has some or all of the following characteristics:
1	Range of resources (people, money, equipment, materials, information, and technologies)	Involves the use of diverse resources
2	Level of interactions	Requires resolution of significant problems arising from interactions among wide-ranging or conflicting technical, computing, contextual, or other issues
3	Innovation	Involves creative use of knowledge of computing or domain principles in novel ways
4	Consequences to society and the environment	Has significant consequences in a range of contexts
5	Familiarity	Can extend beyond previous experiences by applying principles-based approaches

GRADUATE ATTRIBUTES

GA-1 Academic Education: Completion of an accredited program of study designed to prepare graduates as computing professionals.

> ***Note by NCEAC:*** *Accredited program of study implies a computing program which fulfills the Higher Education Commission (HEC) National Qualification Framework curriculum requirements. All courses recommended by HEC's National Curriculum Revision Committee (NCRC) will be mapped to this attribute*.

GA-2 Knowledge for Solving Computing Problems: Apply knowledge of computing fundamentals, knowledge of a computing specialization, and mathematics, science, and domain knowledge appropriate for the computing specialization to the abstraction and conceptualization of computing models from defined problems and requirements.

GRADUATE ATTRIBUTES (CONT'D)

- **GA-3 Problem Analysis:** Identify and solve *complex* computing problems reaching substantiated conclusions using fundamental principles of mathematics, computing sciences, and relevant domain disciplines.

- **GA-4 Design/Development of Solutions:** Design and evaluate solutions for *complex* computing problems, and design and evaluate systems, components, or processes that meet specified needs.

- **GA-5 Modern Tool Usage:** Create, select, or adapt and then apply appropriate techniques, resources, and modern computing tools to *complex* computing activities, with an understanding of the limitations.

GRADUATE ATTRIBUTES (CONT'D)

- **GA-6 Individual and Teamwork:** Function effectively as an individual and as a member or leader of a team in multidisciplinary settings.

- **GA-7 Communication:** Communicate effectively with the computing community about *complex* computing activities by being able to comprehend and write effective reports, design documentation, make effective presentations, and give and understand clear instructions.

- **GA-8 Computing Professionalism and Society:** Understand and assess societal, health, safety, legal, and cultural issues within local and global contexts, and the consequential responsibilities relevant to professional computing practice

GRADUATE ATTRIBUTES (CONT'D)

- **GA-9 Ethics:** Understand and commit to professional ethics, responsibilities, and norms of professional computing practice.

- **GA-10 Life-long Learning:** Recognize the need, and have the ability, to engage in independent learning for continual development as a computing professional.

MAPPING OF GAs TO POs

Graduate Attributes (GAs)	Program Educational Objectives (POs)		
	PO1: Knowledge and Skills	**PO2: Solution to Society's Problems**	**PO3: Leadership and Integrity**
1. Academic Education	√		
2. Knowledge for Solving Computing Problems	√		
3. Problem Analysis	√		
4. Design/ Development of Solutions	√		
5. Modern Tool Usage	√		
6. Individual and Teamwork			√
7. Communication			√
8. Computing Professionalism and Society		√	
9. Ethics		√	
10. Lifelong Learning	√		

ASSESSMENT OF ATTAINMENT OF GAs

Direct Assessment
through
Course Learning Outcomes (CLOs)

MAPPING OF CLOs TO GAs

Ref: CUST, Islamabad

CS1133 – Introduction to Programming

CLO-1. ~~Learn and () Recognize syntax of different constructs of C++.~~ (Ability to recognize syntax of different C++ constructs)

CLO-2. ~~Anticipate~~ (Explain) output for C++ statements.

CLO-3. ~~Learn (Using) C++ constructs, design solution for small scale computational problems~~. (Ability to solve a small-scale computational problem using C++ constructs)

CLO-4. ~~Apply programming knowledge and design algorithms that solve small-to-moderate scale computational problems~~. (Ability to design algorithms to solve small-to-moderate scale computational problems)

MAPPING OF CLOs TO GAs (Cont'd)

	CLO 1	CLO 2	CLO 3	CLO 4
GA2	X	X		
GA3			X	
GA4				X

Measuring Achievement of GAs

- Course Learning Outcomes are assessed through different measures like Quiz, Assignment, Exam Questions, Project, Lab Experiments.

- A knowledge group (faculty) decides on the threshold value to decide achievement of a CLO. For example

  - If 80% of the class achieves 70% marks for a particular CLO then it is achieved

Course Assessment Example

Task	CLO 1	CLO 2	CLO 3	CLO 4
HW 1				
HW 2	60			
HW 3		85		
Quiz 1	65			
Quiz 2				
Quiz 3			71	
Q. 1 of Mid Term		70		
Q. 2 of Mid Term			68	
Q. 3 of Mid Term				82
Q. 4 of Mid Term				
Q. 1 of Final			80	
Q. 2 of Final				
Q. 3 of Final				85
Project				
Average	63	78	73	84

Measuring Achievement of Outcomes

- What if a Course Learning Outcome has not been achieved?
  - The teacher/ departmental Board of Studies takes necessary steps so that CLOs are achieved the next time the course is taught.

- What if a GA has not been achieved?

Remedial Actions: Attainment of GA - Example

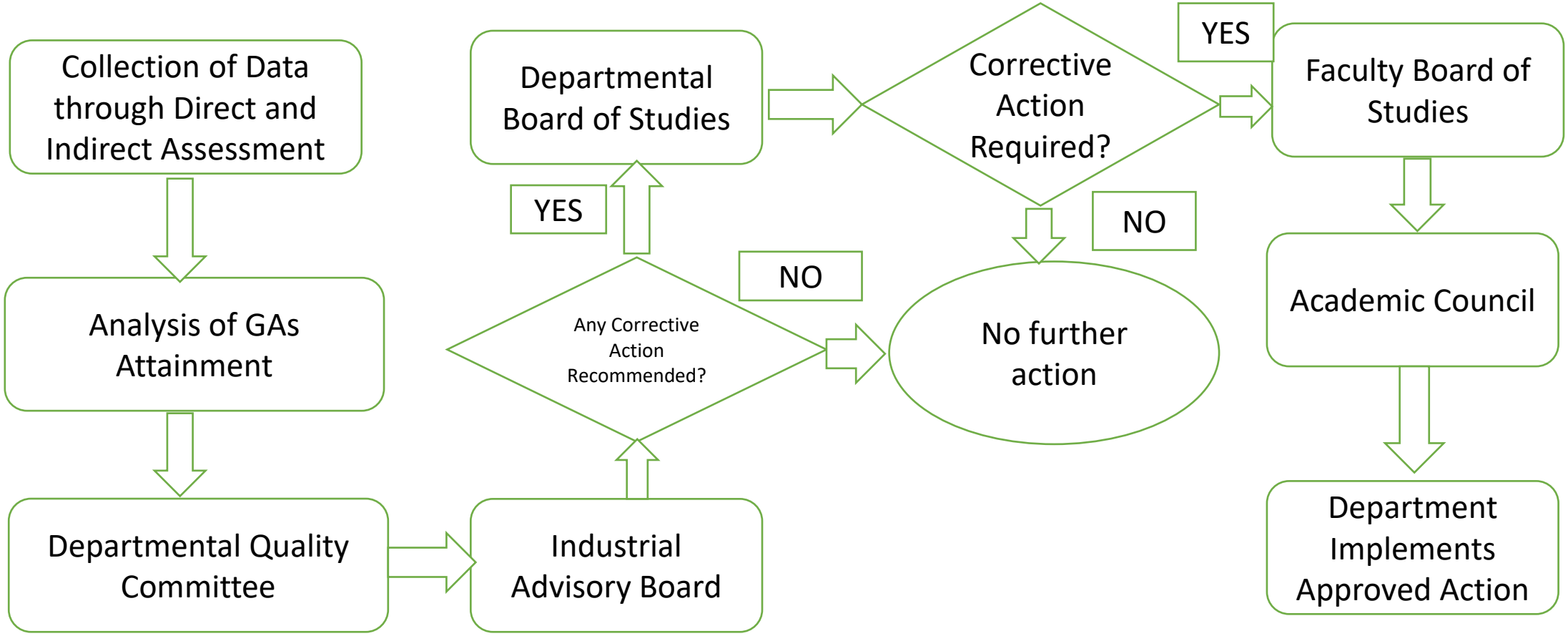
- GA 8 was not achieved by the class graduating in 2018.
- The department recommended inclusion of a course on Health and Safety after due process.
- The same was approved by the Faculty Board and subsequently by the Academic Council.
    - Meeting minutes of all bodies to be recorded in a file as evidence.
- The class graduating in 2020 achieved GA 8.

Improvement Process

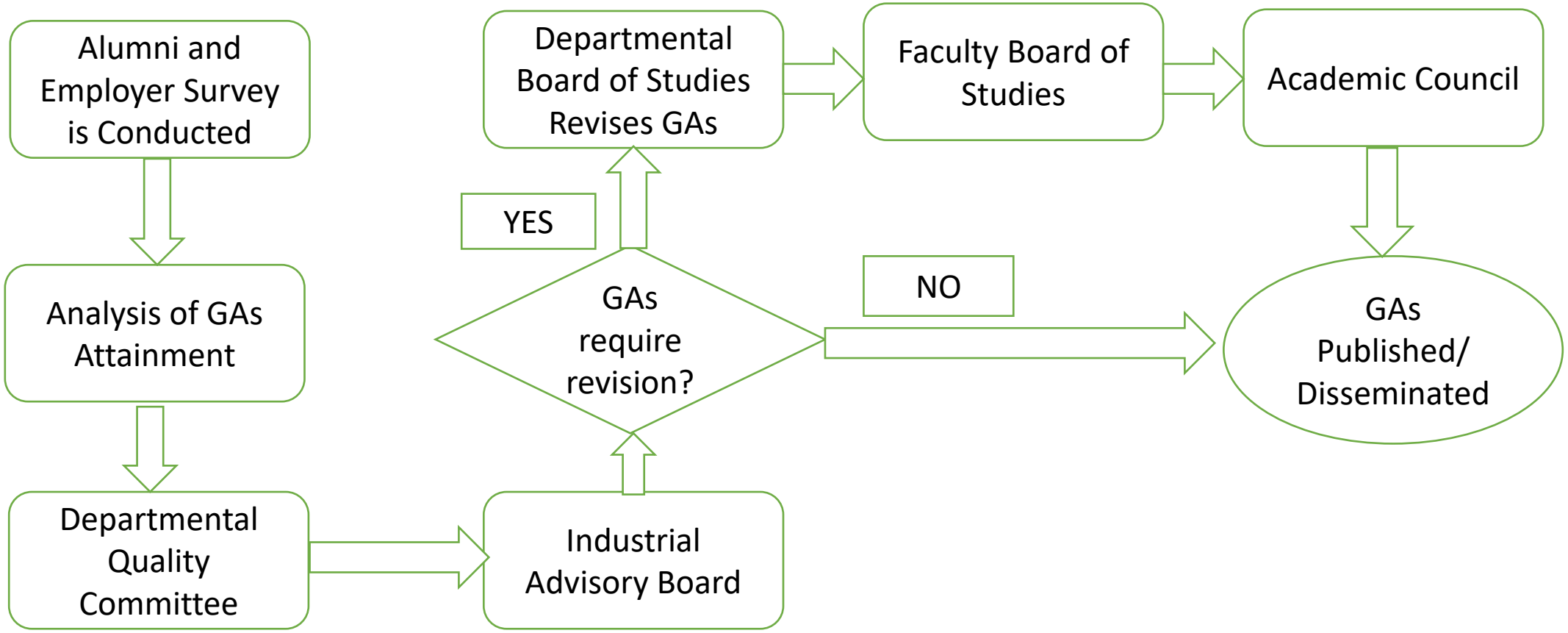
- The course learning outcomes could not be achieved because of a certain reason
  - what was discussed, decided, implemented, documented.

- A GA could not be achieved by the graduating class because of a certain reason
  - So what steps were taken so that it is achieved for the upcoming graduating batch.

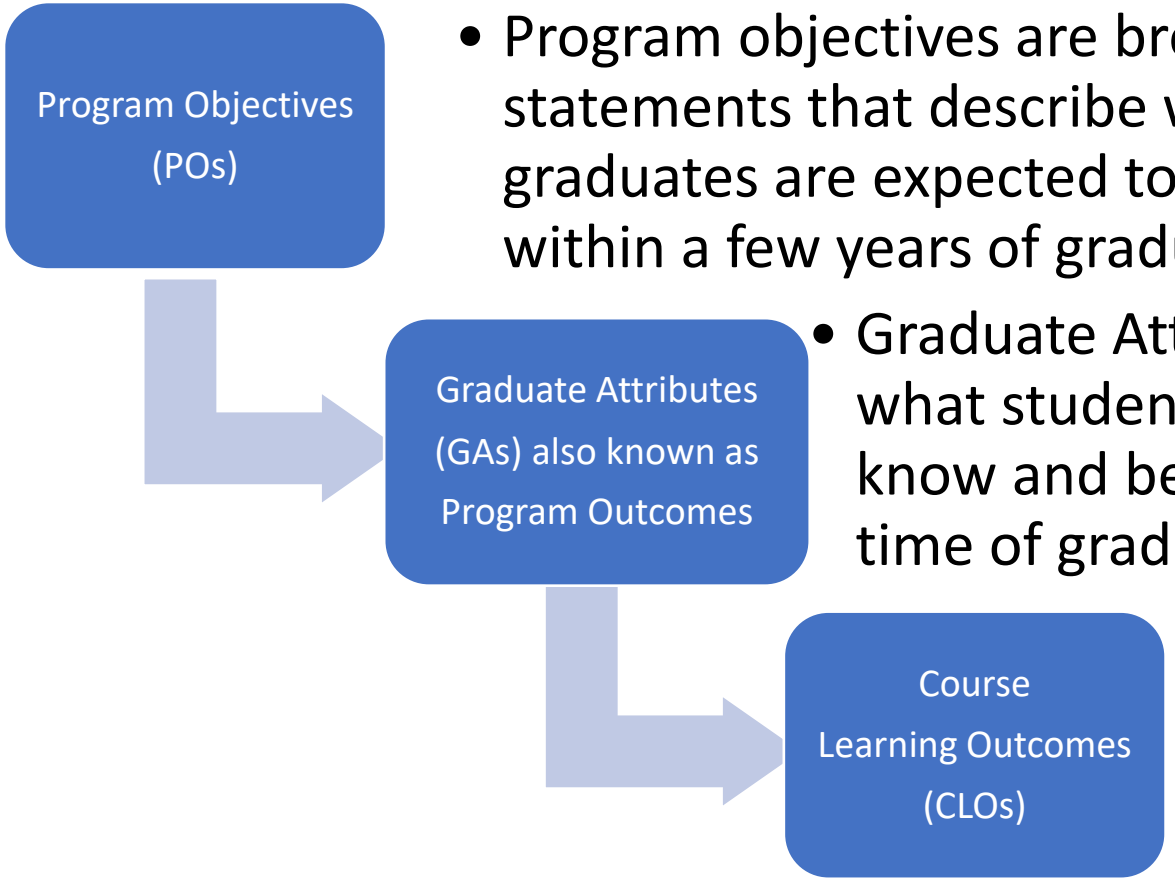
SELF IMPROVEMENT PROCESS BASED ON ATTAINMENT OF GAs



ANNUAL GAs REVIEW PROCESS BASED ON ATTAINMENT



SUMMARY



- Program objectives are broad statements that describe what graduates are expected to attain within a few years of graduation.
- Graduate Attributes describe what students are expected to know and be able to do by the time of graduation
- What students should achieve at the end of the course.

CRITERION – 3

CURRICULUM AND LEARNING PROCESS

Duration, Content of the Curriculum and Graduation Requirement

- Curriculum should be spread over 8 regular semesters (Summer semesters not being counted).
- The total degree contents should encompass a course load of 130 credit hours.
- The curriculum should comply with HEC guidelines.
- One credit hour of theory implies 50 minutes of class contact per week over the duration of the semester and one credit hour of laboratory implies three contact hours of lab work per week spread over the whole semester.
- A minimum 2.0 CGPA (Cumulative Grade Point Average) on a scale of 4.0 is required for award of BS/ BSc Computing Degree.

Assessment of GAs

Since courses are mapped to various GAs, assessment of Course Learning Outcomes (CLOs) provides a direct method of assessment of the related GAs.

Course mapping to GAs

- While planning to teach a course, the course instructor proposes a set of Course Learning Outcomes (CLOs) which are usually approved by the department's Board of Studies. In case of multiple offerings of the same course, all offerings of the same course will have same CLOs.
- CLOs are then mapped to corresponding Graduate Attribute. Note one CLO will be mapped to one GA only.
- However, multiple CLOs may be mapped to the same GA.
- A course usually maps to two, three or four GAs.
- Only FYDP is mapped to more or all GAs.

Laboratory Work

- The teaching/learning in essential subjects must be supported with sufficient practical work in the labs for which each program is expected to have its own dedicated labs.
- Laboratories should be designed to involve students in Complex Computing Activity.
- For this purpose, lab manuals containing all experiments for each course must be maintained.
- The labs should be well-equipped with the requisite computing equipment/machines such as basic components, modules, measuring instruments, etc.

Design Projects

- Computing relates to the design of solutions.
- The students of a computing program must be encouraged to undertake design projects as an integral part of every core subject.
- Such design projects should be geared towards solving complex problems and complex computing activity.

Final Year Design Project (FYDP)

- The final-year design project (FYDP) should span over at least two consecutive semesters, that is, semesters 7 and 8, totaling 6 credit hours. It is the capstone of a computing program.
- Undertaking a final year design project is a compulsory requirement.
- It should mainly comprise literature search, individual analysis, formulation of a complex problem and its solution through complex computing activity.
- The FYDP report shall adhere to the best practices and guidelines of report writing for projects.

Internship Program

- The program should facilitate and promote cooperative learning through mandatory supervised internship program of continuous 6-8 weeks duration in a professional computing organization.
- The training program should be planned and agreed upon by both the institution and the host organization.
- The institution should receive a report about each trainee indicating the training details, interest shown by the student, his/her work habits and punctuality.
- Assessment of internship program through defined rubrics encompassing respective learning domains shall be demonstrated.

CRITERION -4

STUDENTS

Admission Criteria

- At least 50% marks in Intermediate/ DAE with Mathematics as a subject or equivalent 12 years education with Mathematics as a subject are required for admission in all BS/ BSc Computing Programs except BS/ BSc/ BE Computing Engineering.

- At least 50% marks in Intermediate Pre-medical (subject combination of Physics, Chemistry and Biology) or equivalent 12 years education are also eligible to apply. Such candidates, if admitted, are required to study additional two Mathematics courses, worth 6 credit hours, during first year of studies at the institution.

- At least 60% marks in Intermediate/ DAE with Physics, Mathematics and Chemistry/ CS or equivalent 12 years education with Physics, Mathematics and Chemistry/ CS are required for admission in all BS/ BSc / BE Computing Engineering program.

Annual Intake

- This aspect pertains to the number of students admitted considering the capacity of the program and its allied facilities through an assessment process.

- The program intake should be in line with the standards of NCEAC.

Transfer of Students

- The institute shall develop a clear, documented and well publicized policy on the transfer of students from other institutions.
- The policy shall take into account evaluation of credit equivalence for the subjects studied in an accredited program of a HEC recognized institution and should be based on justifiable grounds.
- No more than a maximum of 50% of the total credit hours required for the degree program should be transferred.
- All such cases of student transfer should be intimated to NCEAC for information and record at the time of acceptance by the institution.

Academic Counselling

- This aspect pertains to the guidance available to students from teachers through dedicated office hours beyond scheduled timetable.
- The office hours must be publicized by the instructors by posting them on the office doors/noticeboards.
- Tutorials, problem-solving and/or help sessions, when planned, should be scheduled, and made a part of the timetable.
- RAs and TAs / GAs engaged to provide extra coaching and/or subject assistance, especially when assisting the main instructor with a larger class-size, should also maintain specific designated hours for off-class assistance/counseling.
- Individual students' academic progress should be monitored, and corrective measures taken on a regular basis through well-defined mechanism.

Career and Wellness Counselling

- In addition to the course specific guidance, the institute should have designated student counselors who would advise and counsel students regarding academic as well as career matters.
- A formal orientation session for the newly admitted students to apprise them about the salient requirements and policies/procedures of the program is highly desired.
- The student wellness counselor(s) should also provide assistance to students in managing their health, financial issues, stress, emotional and spiritual problems.

Class Size

Theory

- For all subjects, class size should not exceed 50 students per section.

- Where the main subject instructor is an experienced PhD faculty and is being duly assisted by appropriate number of GAs/ TAs/ RAs/ LEs a bigger class size may be justified.

CLASS SIZE (Cont'd)

Practical

- The number of students conducting experiments in the laboratory at one time should be such as to ensure sufficient practical exposure and proper guidance / supervision by the GAs/ TAs/ RAs/ LEs.
- The number of students per workstation are expected to be limited to 2-3 per workstation.
- Labs which are demonstrative in nature, relatively larger number of students per workstation may be considered reasonable.
- An adequate number of GAs/TAs/RAs/LEs and associated staff should be available for effective guidance and help to students during their practical sessions.

Semester Academic Load

- Students should not be overburdened with workload that may be beyond their ability to cope with or may hamper their assimilation of the subject matter and optimal performance.

- Academic load in a semester should preferably be in the range of 15 ~18 credit hours as prescribed by HEC.

Contents of the Course File

- Course Description including course contents, recommended textbooks, lecture breakdown, office hours for students, Course Learning Outcomes (CLOs) and their mapping to GAs, Assessment tools and their weightage, grading policy etc.

- Schedule of quizzes**/** mid-term tests and final examination.

- Samples of best, worst, and average answer sheets, along with the question paper and model solutions of each sessional(s)/ midterm / quizzes/ assignments and final examination.

Contents of the Course File (Cont'd)

- Record of make-up classes for any unscheduled holiday.
- Breakdown of laboratory experiments pertaining to the course and record of successful conduct.
- Record of CLOs assessment and attainment.
- Instructor course feedback form.
- Recommendation and suggestions related to the course for the next session.

Some Other Aspects

- Participation in Competitions
- Student Performance Evaluation
- Community Service

CRITERION - 5

FACULTY

Faculty Considered Relevant to Computing

As a general guideline, a faculty member is considered to be relevant to the computing program under accreditation if:

- his/ her 16 years qualification is in a computing discipline, Or
- his/ her terminal degree is in a computing discipline, Or
- his/ her terminal degree is in relevant sciences or engineering and has academic or professional computing experience.

Faculty Classification

Dedicated/Fulltime

A faculty member is classified as dedicated/ full-time if he / she has been hired as a regular / full-time faculty member for the computing program and carries at least the minimum teaching load in it.

Faculty Classification (Cont'd)

Shared

A faculty member is classified as Shared if he/ she is employed full time by the HEI in a program other than the computing program or is employed in the computing program but does not carry the minimum teaching load in it.

Visiting

Teachers, who are not employed by the university on full-time basis but are invited from the industry to teach courses in the program under accreditation, are classified as visiting faculty members.

Faculty Requirement

To teach four batches (1st, 2nd, 3rd and 4th year) with each having a maximum of 50 students.

At least seven **DEDICATED FULL-TIME** core computing faculty members INCLUDING:

- At least one with a PhD degree
- At least four having 18 years or equivalent degree.
- At most two full time Demonstrators/ Teaching Fellows/ Teaching Assistants / Junior Lecturers having at least 16 years of computing education.

Faculty Requirement (Cont'd)

- For a brand-new program under a newly established department, there must be at least two full-time core computing faculty members (excluding demonstrators) at the time of zero visit, including at least one with a PhD degree.

- Already established computing programs offered by one or more departments will apply for a Change of Scope visit in case they plan to induct additional students under a program with a new nomenclature. The new program will not admit more than 50 students in its first batch.

Faculty Requirement (Cont'd)

For a new program in an existing department that already offers some computing program(s), the following may be used as a guideline for hiring full-time core computing faculty for a batch of 50 students.

- 1st year only: Minimum three faculty members
- 1st and 2nd year only: Minimum four faculty members
- 1st, 2nd and 3rd year only: Minimum six faculty members
- 1st, 2nd, 3rd and 4th year: Minimum seven faculty member

Faculty Requirement (Cont'd)

- Faculty course load is determined by counting all the courses taught in BS, MS and PhD programs, taught in computing or other departments. The count also includes courses taught in evening or weekend programs.

- Any member of the visiting faculty shall be counted as 0.25 equivalent to full-time faculty member. Maximum permissible cumulative visiting faculty credit is equivalent to one full time faculty member.

- A computing practitioner with 16-years computing degree and minimum 3-years industry experience from a recognized/registered industry may be hired as a visiting faculty.

Faculty Teaching Load

Maximum Teaching Load

- Maximum of 9 credit hours of course load per semester.

Minimum Teaching Load

- A minimum of 9 credit hours of course load per year is required for Full-Time Faculty. However, minimum 6 credit hours of course load is required from faculty members serving in administrative posts like VC/ Rector/Dean/ Chairpersons/ Directors

CRITERION - 6

FACILITIES AND INFRASTRUCTURE

Class Rooms

Minimum 3 classrooms per 200 students' implying for 4 batches each batch comprising of 50 students.

Labs

- Following categories of labs will be considered at the time of evaluation:
  - General Programming Lab(s)
  - Systems Lab(s)
  - Hardware Lab(s)
- The number of hardware stations available should be 1:3 but 1:5 is also acceptable where students tend to keep laptops.

Library

- Minimum of 4 computing related books per students should be available.
- At least 5 photocopies of IEEE/ACM transactions/proceedings should be available in hard copy.
- At least 10 technical Magazines should be available in hard copy.

Others

Provision for supporting facilities like transport, hostels, indoor and outdoor sports facilities for male as well as female students, prayer areas, common rooms etc. should also be available.

CRITERION - 7

INSTITUTIONAL SUPPORT AND FINANCIAL RESOURCES

The institutional support for any degree program is a key to success for the graduates of the program. Therefore, it is expected that the program is supported by the institute through financial and administrative resources for the following purposes:

- To ensure quality and continuity of the program.
- To provide an environment by which student outcomes can be attained.
- To attract, retain, and provide for the continued professional development of a qualified faculty.
- To acquire, maintain, update, and operate infrastructure, facilities and equipment appropriate to the program.

CRITERION-8

STEPS TO IMPROVE QUALITY

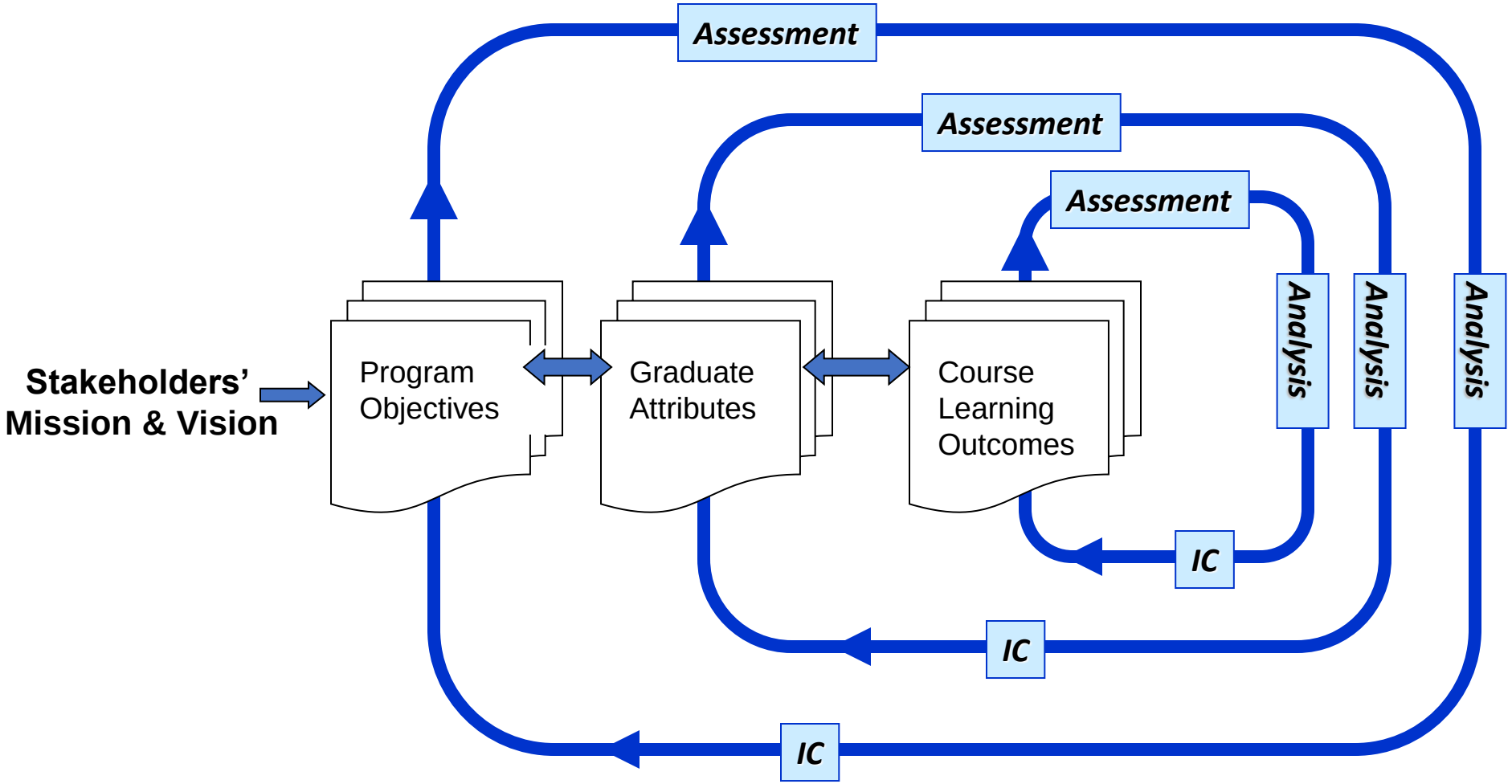
Quality Management Policy

- Imparting quality education should be regarded as a significant and long-term component of all activities carried out by HEIs.

- This requires that a Quality Management Policy must be in place to assure the achievement of Program Objectives and GAs.

- Planning, implementation, monitoring and improvement are the essential elements of any Quality Management Policy, which provides quality assurance confidence to various stakeholders on the graduates' demonstrable attributes.

Improvement Cycle



CRITERION - 9

INDUSTRIAL LINKAGES

Industrial Linkages

Computing is an applied field in nature, therefore, linkage between the program and industry is an essential requirement. For this purpose, following parameter must be followed by the program seeking accreditation.

- There is an Industrial advisory board/committee.
- There is a formal mechanism for seeking feedback from Industry and its analysis for the attainment of POs.
- There are opportunities for students to acquire industrial experience via internship through the institute's Industry-Liaison office.
- The Design projects are sponsored / supervised jointly by Industry Professionals and faculty members.
- Faculty members are involved in design / supervision / consultancy role with the industry in the execution of applied research / design projects that are relevant to society / industry.

الحمد لله