# SAR : Decoding for PEVs

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# SAR Context

- Provides preparedness status at I/P level for the NBA visit,
- Provides the first impression about the I/P to the evaluation team,
- Presents crisp program status to the evaluation team and addresses process and the extent to which, a program meets each criterion,
- Provides documented evidences, which the evaluation team maps/matches with the visual /oral evidences during the visit.

## **SAR Contents**

PART A	Institutional Information				
PART B	Criteria Summary				
Criteria No.	Program Level Criteria				
1	Vision, Mission and Program Educational Objectives				
2	Program Curriculum and Teaching-Learning Processes				
3	Course Outcomes and Program Outcomes				
4	Students' Performance				
5	Faculty Information and Contributions				
6	Facilities and Technical Support				
7	Continuous Improvement				

Criteria No.	Institute Level Criteria					
8	First Year Academics					
9	Student Support Systems					
10	Governance, Institutional Support and Financial Resources					
PART C	Declaration by the Institution					
Annexure-I	Program Outcomes (POs) & Program Specific Outcomes (PSOs)					

## **PART A: Institutional Information**

#### PART A: Institutional Information

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- 1. Name and Address of the Institution:
- 2. Name and Address of the Affiliating University:
- 3. Year of establishment of the Institution:
- 4. Type of the Institution:

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University Deemed University Government Aided Autonomous Affiliated



### PART A:Institutional Information

#### 5. Ownership Status:

Central Government	
State Government	
Government Aided	
Self - Financing	
Trust	
Society	
Section 25 Company	
Any Other (Please specify)	

Provide Details:

6. Other Academic Institutions of the Trust/Society/Company etc., if any:

Name of the Institution(s)	Year of Establishment	Programs of Study	Location

Table A.6 Note: Add rows as needed.

# **PART A: Institutional Information**

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#### 7. Details of all the programs being offered by the institution under consideration:

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S. No.	Program Name	Name of the Department	Year of Start	Intake	Increase in intake, if any	Year of increase	AICTE Approval	Accreditation Status*

Table A.7

#### \* Write applicable one:

- Applying first time
- Granted provisional accreditation for two /three years for the period(specify period)
- Granted accreditation for 5 /6 years for the period (specify period)
- Not accredited (specify visit dates, year)
- Withdrawn (specify visit dates, year)
- Not eligible for accreditation
- Eligible but not applied

## **PART A: Institutional Information**

8. Programs to be considered for Accreditation vide this application:

S. No.	Program Name					
1.						
N.						



9. Total number of employees in the institution:

A. Regular Employees (Faculty and Staff):

Items		CAY		CAYm1		CAYm2	
		Min	Max	Min	Max	Min	Max
	м						
Faculty in Engineering	F						
Faculty in Maths, Science &	м						
Humanities	F						
Non-teaching staff	м						
	F						

#### Table A.9a

*Note:* Minimum 75% should be Regular/Full Time faculty and the remaining shall be Contractual Faculty as per AICTE norms and standards.

### PART A:Institutional Information

The contractual faculty (doing away with the terminology of visiting/adjunct faculty, whatsoever) who have taught for 2 consecutive semesters in the corresponding academic year on full time basis shall be considered for the purpose of calculation in the Student Faculty Ratio

CAY – Current Academic Year

CAYm1- Current Academic Year minus1 = Current Assessment Year

CAYm2 - Current Academic Year minus2=Current Assessment Year minus 1

B. Contractual Staff Employees (Faculty and Staff): (Not covered in Table A):

Items		CAY		CAYm1		CAYm2	
		Min	Max	Min	Max	Min	Max
	м						
Faculty in Engineering	F						
Faculty in Maths, Science &	м						
Humanities	F						
Non-teaching staff	м						
	F						

## **PART A: Institutional Information**

10. Total number of Engineering Students:

Item	CAY	CAYm1	CAYm2
Total no. of boys			
Total no. of girls			
Total no. of students			

#### Table A.10

(Instruction: The data may be categorized in tabular form separately for undergraduate, postgraduate engineering, other program, if applicable)

**Note:** In case the Institution is running AICTE approved additional courses such as MBA, MCA in the first shift, engineering courses in the second shift, Polytechnic in Second shift etc., separate tables with the relevant heading shall be prepared.

## **PART A: Institutional Information**

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- 11. Vision of the Institution:
- 12. Mission of the Institution:

#### 13. Contact Information of the Head of the Institution and NBA coordinator, if designated:

i. Name:

Designation:

Mobile No:

Email id:

ii. NBA coordinator, if designated:

Name:

Designation:

Mobile No:

Email id:

# PART B: Criteria Summary

Criteria No.	Criteria	Mark/Weightage	
	Program Level Criteria	Tier 2	Tier 1
1.	Vision, Mission and Program Educational Objectives	60	50
2.	Program Curriculum and Teaching – Learning Processes	120	100
3.	Course Outcomes and Program Outcomes	120	175
4.	Students' Performance	150	100
5.	Faculty Information and Contributions	200	200
б.	Facilities and Technical Support	80	80
7.	Continuous Improvement	50	75

**780** 

# PART B: Criteria Summary

	Institute Level Criteria	Tier 2	Tier 1
8.	First Year Academics	50	50
9.	Student Support Systems	50	50
10.	Governance, Institutional Support and Financial Resources	120	120
	Total	1000	1000

#### **CRITERION-1: Vision, Mission and Program Educational Objectives (PEOs)**

### **1.1. State the Vision and Mission of the Department and Institute.(5)**

- Vision statement typically indicates aspirations and Mission statement states the broad approach to achieve aspirations
- Should be written in a simple language, easy to communicate and should define objectives which are out of reach in the present context
- Department Vision and Mission statements shall be consistent with the Institute Vision and Mission statements

## **Vision and Mission Statements**

(as per NBA document)

**Vision** is a futuristic statement that the institution would like to achieve over a long period of time, and Mission is the means by which it proposes to move toward the stated Vision

Example..

### Vision:

Action verb ??

To emerge as one of the nation's finest Institutions in the field of Technical Education and Research through focused, effective and <u>sustained monitoring</u> of its programmes and resources.

### Mission:

To develop high quality professionals ingrained in ethics, wisdom and creativity for the betterment of the society.

# **Corrected Vision and Mission Statements**

## Vision:.

To emerge as one of the nation's finest Institutions of higher learning in the field of Technical Education to develop professionals who are technically competent, ethical, environment friendly for betterment of society.

### **Mission:**

Accomplish stimulating learning environment for students through quality teaching, research and outreach activity by providing state of the art facilities, industry exposure and guidance of dedicated faculty

### Department Vision and Mission Statements (Sample)

### Vision:

To be an excellent centre for imparting quality higher education in Civil Engineering for a constantly changing societal needs with credibility, integrity and ethical standards.

### Mission:

Accomplish excellence in curricular, co-curricular activities with a committed faculty through teaching and research which creates technically competent and dedicated civil engineers to serve their surroundings with pride.

# Evaluation

- A. Availability of the Vision and Mission statements of the Department (1)
- B. Appropriateness/Relevance of the Statements (2)
- C. Consistency of the Department statements with the Institute statements (2)

(Here Institute Vision and Mission statements have been asked to ensure consistency with the department Vision and Mission statements; the assessment of the Institute Vision and Mission will be done in Criterion 10)

#### Exhibits/Context to be Observed/Assessed:

- A. Vision & Mission Statements
- B. Correctness from definition perspective
- C. Consistency between Institute and Department statements

### **1.2. State the Program Educational Objectives (PEOs)** (5)

Define the PEOs under the following broad categories:

- i. Preparation : Employment/Higher studies
- ii. Core competence : Discipline knowledge
- iii. Professionalism : Professional value knowledge development
- iv. Life long learning : Environment
- A. Listing of the Program Educational Objectives (3 to 5) of the program under consideration (5)

#### Exhibits/Context to be Observed/Assessed:

A. Availability & correctness of the PEOs statements



### **PEOs** (Samples)

PEO1:

Graduate will compete on a global platform to pursue their professional career in Electrical Engineering and allied disciplines.

PEO2:

Graduates will pursue higher education and/or engage in continuous up gradation of their professional skills. PEO3:

Graduate will communicate effectively and will demonstrate professional behaviour while working in diverse team. **PEO4**:

Graduates will demonstrate concern for society and environment.

### (Samples 2 - Civil Engineering)

### <sub>°</sub> PEO1:

Practice civil engineering in construction industry, public sector undertaking and as an entrepreneur for successful professional career.

PEO2:

Pursue higher education for professional development PEO3:

Exhibit leadership qualities with demonstrable attributes in lifelong learning to contribute to the societal needs.

# **1.3. Indicate where the Vision, Mission and PEOs are published and disseminated among stakeholders (PEOs) (10)**

- Availability on Institute website under relevant program link
- Availability at department notice boards
- Department website, if available
- Availability in department level documents
- Documentary evidence

- A. Adequacy in respect of publication & dissemination (2)
- B. Process of dissemination among stakeholders (2)
- C. Extent of awareness of Vision, Mission and PEOs among the stakeholder (6)

### Exhibits/Context to be Observed/Assessed:

A. Adequacy

Department Vision, Mission and PEOs: Availability on Institute website under relevant program link; Availability at department notice boards, HoD Chamber, department website, if Available; Availability in department level documents/course of study

### B. Process of dissemination

Documentary evidence to indicate the process which ensures awareness among internal and external stakeholders with effective process implementation

C. Extent of Awareness

Based on interaction with internal and external stakeholders

# 1.4. State the process for defining the Vision and Mission of the Department and PEOs of the program (25)

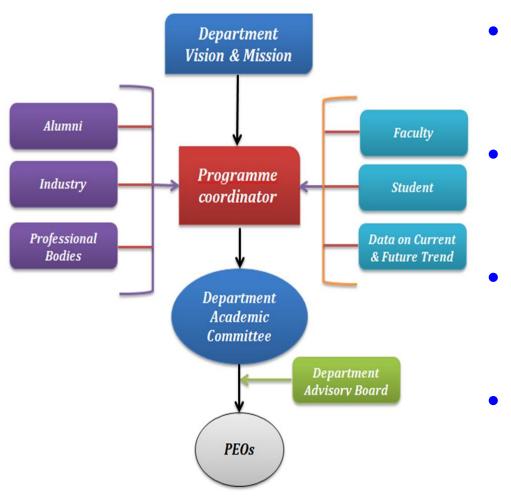
Process to ensure:

- Effective participation of Stakeholders
- Effective Process implementation
- Documentary evidence
- A. Description of process involved in defining the Vision, Mission of the Department (10)
- **B.** Description of process involved in defining the PEOs of the program (15)

#### Exhibits/Context to be Observed/Assessed:

Documentary evidence to indicate the process which ensures effective participation of internal and external department stakeholders with effective process implementation

### **Processes for PEOs**



- Feedbackformatforcollectingdatafromstakeholders
  - A process by which PEOs are created and reviewed periodically
  - A process to evaluate to what extent PEOs are attained.
- Review, Mid correction, and Continuous Quality Improvement

### **1.5. Establish consistency of PEOs with Mission of the Department (15)**

Generate a "Mission of the Department – PEOs matrix" with justification and rationale of the mapping:

PEO Statements	M1	M2	••••	Mn
PEO 1				
PEO 2				
PEO 3				
PEO 4				

**Note:** M1, M2, . . Mn are distinct elements of Mission statement.

Enter correlation levels 1, 2 or 3 as defined below:

1: Slight (Low)

- 2: Moderate (Medium)
- 3: Substantial (High)

If there is no correlation, put "-"

#### Mission of the Department:

- M1: Make competent Civil Engineers with high level of professional, moral and ethical values
- M2:Impart highest standards in theoretical as well as practical knowledge and skill set
- M3:Establish Center of Excellence in major areas of Civil Engineering to respond to the current and future needs of the industry
- **PEO1**: Graduates will have successful career in the field of Civil Engineering
- PEO2: Graduates will respond to growing demands of society through professional and ethical practices
- PEO3: Graduates will pursue lifelong learning including higher studies in the field of Civil Engineering

### What is Expected here ?

#### **Establish consistency of PEOs with Mission of the Department (15)**

Generate a "Mission of the Department – PEOs matrix" with justification and rationale of the mapping

PEO Statements	M1	M2	••••	Mn
PEO 1	3/2/1 ?	3/2/1 ?		
PEO 2				
PEO 3	3/2/1 ?			
PEO 4				

- A. Preparation of a matrix of PEOs and elements of Mission statement (5)
- B. Consistency/justification of co-relation parameters of the above matrix (10)

#### Exhibits/Context to be Observed/Assessed:

- A. Availability of a matrix having PEOs and Mission elements
- B. Justification for each of the elements mapped in the matrix

#### **CRITERION-2:** Program Curriculum and Teaching – Learning Processes (TLP)

### 2.1. Program Curriculum (20)

2.1.1. State the process used to identify extent of compliance of the University curriculum for attaining the Program Outcomes and Program Specific Outcomes as mentioned in Annexure-I. Also mention the identified curricular gaps, if any (10)

- State the process details
- Mention identified curricular gaps
- Extent of compliance

#### Exhibits/Context to be Observed/Assessed:

- A. Documentary evidence to indicate the process which ensures mapping/compliance of University Curriculum with the POs & PSOs; Identification of gaps; if any.
- B. Identified Curricular gaps and its Appropriateness

2.1.2. State the delivery details of the content beyond the syllabus for the attainment of POs & PSOs (10)

Details of the following for the attainment of POs & PSOs

- Additional course
- Learning material/Content
- Laboratory experiments
- Projects etc.

Institute to provide inputs to the Affiliating University regarding curricular gaps and possible addition of new content/add-on courses in the curriculum to better attain program outcome(s)



# **Curriculum- Tier 2**

- Analyze the University Curriculum
  - Determine the Gaps in Attainment of POs
- Design Extra {modules} / {Assessments} to Bridge these gaps
- Could need a few iterations

 Analysis may indicate that not all POs are Attainable with the Given Curriculum.

 May need some additional modules and Design of In-Sem evaluation and assessment to take care of the gaps.

• A record of all this work is needed.

- A. Steps taken to get identified gaps included in the curriculum. (e.g. letter to university/BOS) (2)
- B. Delivery details of content beyond syllabus (5)
- C. Mapping of content beyond syllabus with the POs & PSOs (3)

(Provide details of the additional course/learning material/content/laboratory experiments/projects etc., arising from the gaps identified in 2.1.1 in a tabular form in the format given below)

#### CAYm1

S.No.	Gap	Action taken	Date- Month-Year	Resource Person with designation	Relevance to POs, PSOs

Table B.2.1.2a

#### Exhibits/Context to be Observed/Assessed:

- A. Documentary evidence of steps taken at regular interval
- B. Delivered details documentary evidence for at least one sample per assessment year to be verified
- C. Availability and appropriateness of Mapping table between contents delivered and Program outcomes/Program specific outcomes (Course outcomes)

### **2.2. Teaching-Learning Processes.**

2.2.1. Describe Processes followed to improve quality of Teaching and Learning

Processes may include adherence to academic calendar and implementation of pedagogical initiatives such as -

- Real life examples
- Collaborative learning
- Quality of laboratory experience with regard to conducting experiments
- Recording observations
- > Analysis of data etc.
- Encouraging bright students
- ➤ Assisting weak students etc.
- ➢ ICT supported learning
- Interactive classrooms

- A. Adherence to Academic Calendar (3)
- B. Use of various instructional methods and pedagogical initiatives (3)
- C. Methodologies to support weak students and encourage bright students(4)
- D. Quality of classroom teaching (Observation in a Class) (3)
- E. Conduct of experiments (Observation in Lab) (3)
- *F.* Continuous Assessment in the laboratory (3)
- G. Student feedback of teaching learning process and actions taken (6)

#### Exhibits/Context to be Observed/Assessed:

- A. Availability of Academic Calendar based on University academic calendar and its effective compliance
- B. Documentary evidence to support implementation of pedagogical initiatives such as real life examples, collaborative learning, ICT supported learning, interactive class rooms etc.
- C. Guidelines to identify weak and bright students; post identification actions taken; impact observed
- D. Class room ambience; efforts to keep students engaged (also to be verified during interaction with the students)
- *E. Quality of laboratory experience with respect to conducting, recording observations, analysis etc.(also to be verified during interaction with the students)*
- *F. Internal Semester examination and internal marks thereof, Practical record books, each experiment assessment, final marks based on assessment of all the experiments and other assessments; if any*
- G. Feedback format, frequency, analysis and actions taken (also to be verified during interaction with students)

### 2.2.2. Quality of internal semester Question papers, Assignments and Evaluation.

Mention the initiatives, Implementation details and analysis of learning levels

related to –

- a. Quality of Semester Question papers
- b. Assignments
- c. Evaluation
- d. Relevance to COs

#### Exhibits/Context to be Observed/Assessed:

- A. Process of internal semester question paper setting, model answers, evaluation and its compliance
- B. Question paper validation to ensure desired standard from outcome attainment perspective as well as learning levels perspective
- C. Mapping of questions with the Course outcomes
- D. Assignments to promote self-learning, survey of contents from multiple sources, assignment evaluation and feedback to the students, mapping with the COs

### 2.2.3. Quality of Student Projects

Consideration to factors including, but not limited to -

- Environment & Safety
- Ethics
- Cost
- Type (application, product, research, review etc.)
- Standards
- Processes related to project identification, allotment, continuous monitoring and evaluation
- Demonstration of working prototype sand enhancing the relevance of projects.
- Mention Implementation details including details of POs and PSOs addressed with justification

#### Exhibits/Context to be Observed/Assessed:

- A. Projects identification and guide allocation Process
- B. Projects classification (application, product, research, review etc.) consideration to factors such as environment, safety, ethics, cost, standards and mapping with program outcomes and program specific outcomes
- C. Continuous monitoring mechanism and evaluation
- D. Methodology (Appropriately documented) to assess individual contribution/ understanding of the project as well as collective contribution/understanding
- E. Based on Projects demonstration
- *F. Quality of place (host) where the paper has been published /quality of competition in which award has been won*

### 2.2.4. Initiatives related to industry interaction

- Industry supported laboratories.
- Industry involvement in the program design and partial delivery of any regular courses for students.
- Impact analysis of industry institute interaction and actions taken thereof

### Exhibits/Context to be Observed/Assessed:

- A. Type of Industries, Type of Labs, objectives, utilization and effectiveness
- B. Documentary evidence
- C. Analysis and actions taken thereof

## 2.2.5. Initiatives related to industry internship/summer training

- Industrial training/tours for students.
- Industrial / internship / summer training of more than two weeks and post training Assessment.
- Impact analysis of industrial training.
- Student feedback on initiatives

#### Exhibits/Context to be Observed/Assessed:

- A. & B. Type of Industries, planned or non-planned activity, objectives clearly defined, no. of students participated, relevant area of training, visit report documented
- C.& D. Impact analysis and feedback format, analysis and actions taken (also to be verified during interaction with students)

# **CRITERION 3: Course Outcomes and Program Outcomes**

**3.1. Establish the correlation between the Courses and the Program Outcomes (POs) and Program Specific Outcomes (PSOs)** 

### 3.1.1. Course Outcomes (COs)

SAR should include course outcomes of One course/Semester (3rd to 8th) of study, however, should be prepared for all courses and made available as evidence

#### Exhibits/Context to be Observed/Assessed:

A. Appropriateness of the statements shall be seen for atleast one course each from 2nd, 3rd and final year of study

# **Program Outcomes**

- POs are statements about the knowledge, skills and attitudes (attributes) the graduate of a formal engineering program should have.
- Profile of the Graduates reached through POs Target
- POs are defined by Accreditation Agencies of the country (NBA in India)
- Defining these is the Starting Point

# **Program Outcomes (POs)**

- 1. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- 2. **Problem Analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- 3. Design/Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations
- 4. Conduct Investigations of Complex Problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

### Conti...

- **5. Modern Tool Usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
- 6. The Engineer and Society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- 7. Environment and Sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- **8.** Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

### Conti...

- Individual and Team Work: Function effectively as an individual,
   and as a member or leader in diverse teams, and in multidisciplinary settings.
- **10. Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- 11. **Project Management and Finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- 12. Life-long Learning: Recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change.

# PROGRAM SPECIFIC OUTCOMES (PSO)

 These outcomes are specific to a program in addition to NBA defined POs, namely, Civil, Mechanical, Chemical, Computer science etc.,(2-4)

# **ELECTRICAL & ELECTRONICS ENGINEERING**

At the end of the program, students will have the ability to: **PSO1** 

 Develop models, analyze and assess the performance of different types of generation, transmission, distribution and protection mechanisms in power systems.

# PSO2

 Design, develop, analyze and test electrical and electronics systems; deploy control strategies for power electronics related and other applications.

# PSO3

 Measure, analyze, model and control the behavior of electrical quantities associated with constituents of energy or allied systems.

#### **CRITERION 3: Course Outcomes and Program Outcomes**

3.1.2. CO-PO matrices of courses selected in 3.1.1 (six matrices to be mentioned; one per semester from 3rd to 8th semester)

A. Explanation of table to be ascertained (5)

Exhibits/Context to be Observed/Assessed:

A. Mapping to be verified for atleast two matrices

*Note:* Enter correlation levels 1, 2 or 3 as defined below:

1: Slight (Low)

2: Moderate (Medium)

- 3: Substantial (High)
- 3.1.3. Program level Course-PO matrix of all courses INCLUDING first year courses
  - It may be noted that contents of Table 3.1.2 must be consistent with information available in Table 3.1.3 for all the courses.

#### Exhibits/Context to be Observed/Assessed:

A. Mapping to be verified for atleast one course per year of study; program outcomes and program specific outcomes getting mapped with the core courses are also to be verified



# **Course Outcomes**

## **Engineering Physics (Not a Good Example)**

- **CO1:** Understand the knowledge of basic quantum mechanics, to set up one-dimensional Schrodinger's wave equations and its application to few physical problems.
- **CO2:** Understand the fundamental aspects of crystallography, able to recognize various planes in a crystal and have knowledge of structure determination using x-rays.
- **CO3:** Understand the role of free electrons in determining the properties of metals, the concept of Fermi energy, and the domain formation in ferromagnetic materials.
- **CO4:** Understand the basic laser physics, working of lasers, holography and principle of propagation of light in optical fibers.
- **CO5:** Understand the theory of free, damped and forced vibrations of a particle and also the concept of resonance and its applications in ESR & NMR.

# What level of BLOOM,s Taxonomy you want your students to achieve?

# **Course Title: Strength of Materials**

# **<u>Course Outcomes: Example</u>**

At the end of the course, student is able to: Action Verb

- <u>Apply laws of physics (eg..Hook's law, etc.,)</u> to compute different <u>types of response (stress and deformation)</u> in the given materials. (PO 1)
- 2. Analyse structural elements for different force systems to compute design parameters (BM and SF) (PO2)
- **3. Design** compression elements using engineering principles to resist any given loads. (PO3)
- Conduct experiments to validate physical behaviour of materials/components.(PO4)
- 5. **Prepare** laboratory reports on interpretation of experimental results (P10)

# **CO-PO Relationship**

- Each CO can be identified to address a subset of POs
- Based on the number of COs and the sessions dedicated to them it is possible to identify the strength of mapping (1, 2 or 3) to POs
- Based on these strengths of selected POs a CO matrix can be established.

# **CO-PO Relationship**

COURSE	COs	<b>PO1</b>	PO2	PO3	PO4	PO5	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	PO9	<b>PO10</b>	PO11	PO12
Analysis of structures II	<b>CO1</b>	3	3	-	-	-	-	-	-	-	-	-	-
Analysis of structures II	CO2	3	3	-	-	-	-	-	-	-	-	-	-
	<b>CO1</b>	3	2	-	3	-	3	3	-	-	-	-	-
<b>Environmental Engineering I</b>	CO2	3	3	-	-	-	3	3	-	-	3	-	-
	CO3	-	-	3	-	-	-	3	3	-	3	-	-
	CO1	3	3	-	-	-	-	-	-	-	-	-	-
Geotechnical Engineering II	CO2	3	3	-	-	-	-	-	-	-	-	-	-
Geotechnical Engineering II	CO3	3	3	-	-	-	-	-	-	-	-	-	-
	CO4	3	3	2	-	-	3	-	-	-	-	-	-
	<b>CO1</b>	3	-	-	-	-	-	-	-	-	-	-	-
Concrete Technology	CO2	-	3	3				-	-		-		-
Concrete reenhology	CO3	-	3	3	-	-	-	-	-	-	-	-	-
	<b>CO4</b>	-	-	-	-	-	-	-	3	3	-	-	-
Hydrology and water	CO1	3	3	-	-	-	-	-	-	-	-	-	-
resources	CO2	3	3	-	-	-	-	-	-	-	-	-	-
resources	CO3	3	3	3	-	-	-	-	3	-	-	-	-
	CO1	3	3	-	1	-	-	-	-	-	-	-	-
Quantity Surveying and	CO2	3	3	-	-	2	2	-	-	-	-	-	-
Costing	CO3	3	3	-	-	-	-	-	-	-	-	-	-
	<b>CO4</b>	2	3	2	-	-	3	-	-	-	-	-	-
	CO1	3	-	-	-	-	-	3		-	-	-	1
Alternate Building Material &	CO2		3	-		-	-	3		-	-	-	3
Technology	CO3		-	-	-		-	3		-	-	-	2
	<b>CO4</b>			3	-	2	-	2	3	-	-	-	-
	CO1	-	-	-	-	-	-	3	-	3	-	-	-
Major Project Phase II	CO2	3	3	3	3	-	-	-	3	3	-	-	3
	CO3	-	-	-	-	3	-	-	-	3	-	-	-
	CO4	-	-	-	-	-	-	-	-	3	3	2	-

## **3.2. Attainment of Course Outcomes**

- 3.2.1. Describe the assessment processes used to gather the data upon which the evaluation of Course Outcome is based
  - Examples of data collection processes may include, but are not limited to-
    - Specific exam/tutorial questions
    - Assignments
    - Laboratory tests
    - Project evaluation
    - Student portfolios
  - A portfolio is a collection of artifacts that demonstrate skills, personal characteristics, and accomplishments created by the student during study period, internally developed assessment exams, project presentations, oral exams etc.

#### Exhibits/Context to be Observed/Assessed:

A. & B. Evidence for appropriate assessment processes including data collection, verification, analysis, decision making

- 3.2.2. Record the attainment of Course Outcomes of all courses with respect to set attainment levels
  - Program shall have set Course Outcome attainment levels for all courses
  - The attainment levels shall be set considering average performance levels in the University Examination or any higher value set as target for the assessment years
  - Attainment level
    - Student performance in internal assessments with respect the Course Outcomes
    - Performance in the University Examination

#### Exhibits/Context to be Observed/Assessed:

A. Methodology to define set levels and its compliance; data collection, verification, analysis and decision making; details for one course per year of study to be verified

Measuring Course Outcomes attained through University Examinations **Example related to attainment levels Vs. targets:** 

(The examples indicated are for reference only. Program may appropriately define levels)

Attainment Level 1: 60% students scoring more than University average percentage marks or set attainment level in the final examination

Attainment Level 2: 70% students scoring more than University average percentage marks or set attainment level in the final examination

Attainment Level 3: 80% students scoring more than University average percentage marks or set attainment level in the final examination

- Attainment is measured in terms of actual percentage of students getting set percentage of marks
- If targets are achieved then all the course outcomes are attained for that year Program is expected to set higher targets for the following years as a part of continuous improvement
- If targets are not achieved the program should put in place an action plan to attain the target in subsequent years

#### **Measuring CO attainment through Internal Assessments:**

Target may be stated in terms of percentage of students getting more than class average marks or set by the program in each of the associated COs in the assessment instruments (midterm tests, assignments, mini projects, reports and presentations etc. as mapped with the COs

### **Examples related to attainment levels Vs. targets:**

Attainment Level 1: 60% students scoring more than 60% marks out of the relevant maximum marks

Attainment Level 2: 70% students scoring more than 60% marks out of the relevant maximum marks

Attainment Level 3: 80% students scoring more than 60% marks out of the relevant maximum marks

- Attainment is measured in terms of actual percentage of students getting set percentage of marks
- If targets are achieved then the PY1ICPHY and CV3DCMOF are attained for that year. Program is expected to set higher targets for the following years as a part of continuous improvement
- If targets are not achieved the program should put in place an action plan to attain the target in subsequent years
- Similar targets and achievement are to be stated for the other midterm tests/internal assessment instruments

### **Course Outcome Attainment:**

### For example:

Attainment through University Examination: Substantial i.e. 3 Attainment through Internal Assessment: Moderate i.e. 2 Assuming 80% weightage to University examination and 20% weightage to Internal assessment, the attainment calculations will be (80% of University level) + (20% of Internal level ) i.e. 80% of 3 + 20% of 2 = 2.4 + 0.4 = 2.8

**Note:** Weightage of 80% to University exams is only an example. Programs may decide weightages appropriately for University exams and internal assessment with due justification

50% - 50% Weightage = 1.5+1=2.5

Program may decide five attainment levels instead of three For ex.-

### **Attainment levels:**

- Level 5 Very High Score from >2.5 to 3
- Level 4 High Score from > 2 to 2.5
- Level 3 Medium Score from >1.5 to 2
- Level 2 Low Score from >1 to 1.5
- Level 1 Very Low- Score from 0.5 to < 1

8.50 x 11.00 in

×

#### Table 3.3 COURSE OUTCOMES OF ME6503-Design of Machine Elements

<b>ME6503</b>	ME6503- Design of Machine Elements	K-Level			
ME6503.1	Students will <b>understand</b> various steps involved in the Design Process, principles involved in evaluating the shape and dimensions of a component to satisfy functional and strength requirements.	Understand			
ME6503.2	Students will be able to <b>apply</b> the concepts for design of shafts and couplings using standard practices and standard data	Apply			
ME6503.3	<b>503.3</b> Students will <b>apply</b> standard practices and standard data while designing temporary and permanent fasteners.				
ME6503.4	Students will <b>apply</b> standard practices and standard data while designing energy storing elements and familiarize with usage of catalogues and standard machine components.	Apply			
ME6503.5	Students will <b>apply</b> standard practices and standard data and to use catalogues while designing bearings.	Apply			
ME6503.6	Students can able to successfully design and analyze machine components.	Apply			

**Course Name : ME6503-Design of Machine Elements** 

Communication

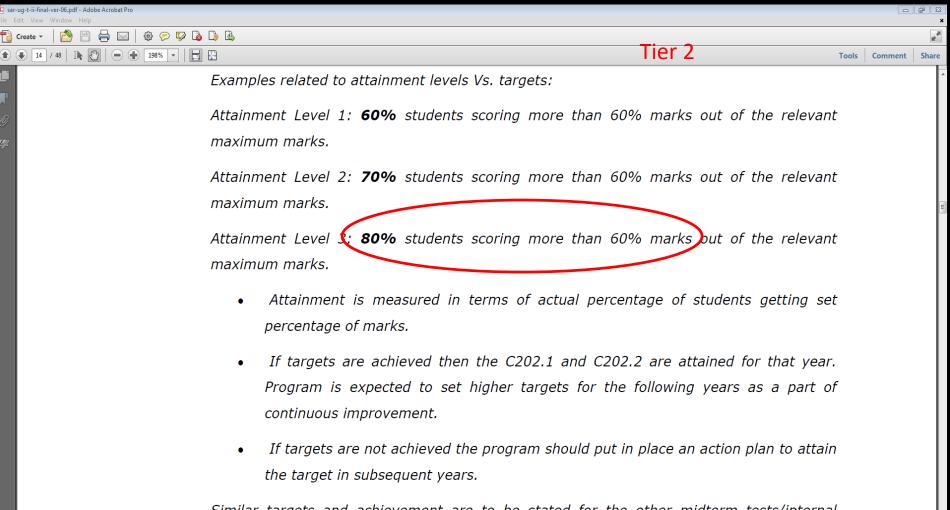
 Table 3.9 CO PO MATRIX OF ME6503-Design of Machine Elements

	<b>PO1</b>	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	<b>PO8</b>	PO9	<b>PÓ10</b>	<b>PO11</b>		
ME6503.1	3	3	2	2	2	3	2	2	2	3	2		
ME6503.2	3	3	2	2	2	3	2	2	2	3	2		
ME6503.3	3	3	2	2	2	3	2	2	2	3	2		
ME6503.4	3	3	2	2	2	3	2	2	2	3	2		
ME6503.5	3	3	2	2	2	3	2	2	2	3	2		
ME6503.6	3	3	3	2	2	3	2	2	2	3	2		
ME6503	3	3	2.16	2	2	3	2	2	2	3	2		

# CO-PO mapping ??

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r	as evidence, it asked, (05) Vame: LOGIC DESIGN Year of Study: 2	Course - 2015	Name	e: LO		)ESI (pp			D	esi	gn		Year of		
- 2015	·		2	Р	P	P	Р	P	Р	Р	Р	PO	P	PO	PS
C203.1	Apply the fundamental concepts of binary logic.		0	02	03	04	05	06	07	08	09	10	0	12	01
C203.2	Formulate the techniques to design an optimal logic circuit.	C203.1	3	3	3	2		-			-		•	-	
C203.3	Analyze combinational circuits and their application as logic design components in	C203.2	3	3	3	1	•	-	•	•	-	•	-	-	•
	digital systems.	C203.3	3	3	3	1	-	-	-	-	-	-	-	-	•
C203.4	Design combinational circuits to perform specific digital functions.	C203.4	3	3	2	$\square$	•	•	-	•	•	•	-	-	-
C203.5	Analyze sequential circuits and design sequential applications for digital systems.	C203.5	3	3	2	1	-	-	-	-	-	•	-	-	-
C203.6	Design, analyze and demonstrate a micro digital system.	C203.6	3	2	1	1	-	-	•	-	-	•	•	•	-
	James I INFAD IC'S & ITS ADDI ICATIONS Voor of Study	C203	3	3	3	1	•	•	-	-	-	•	-	-	-

# CO – Attainment Attainment Target



Similar targets and achievement are to be stated for the other midterm tests/internal assessment instruments

Example	e of CO-atta	ainn	nent	fo	r a	course	
						Course Name Conc	crete Technology
						Course Code CV 4	H
Grading Scale						Session of Batch	2013 505
SCORE : < 50%	1					Course Dec'	· •
50% - < 70%	2					L :T : P -	2013
>=70%	3					Semester :	I
						Credits :	4
75%	Percent of Students should	score > 7	'0% of ma	rks for		Batch :	2013
1010	Attainment					Faculty : R V R	Ranganath
						1	8
СО	CO Decription	T1	T2	A1	A2	LAB	
	Identify constituent of concrete	e					

СО	CO Decription	T1	T2	A1	A2		LAB
CO1	<b>Identify</b> constituent of concrete material characteristics and different types of concrete for their appropriate use in construction. [K 2](PO1)			-	-	-	-
CO2	Compare behaviour of concrete properties with known materials for design applications(PO2, PO3)			A1	-	-	-
CO3	<u>Analyse</u> characteristics of mix constituents and <u>design</u> a concrete mix for field applications. { PO2, PO3)		Q1, Q2	-	A2 -	-	
CO4	Prepare a comprehensive report on new knowledge in any one of the topic related to concrete technology [K5] (PO8, PO9)			-		-	lab-

50%

70%

	Program Outcomes			PO	1	 														
	Max Marks	10	10	10	10		40					5				5				
	Course Outcomes			со	1		BTAINED	<b>GELLAMELLED</b>	PERCENT, %	S CORES OR GRADING BASED ON SCALE OF 3	Target> =70 %		C02			3TAINED ATTEMPTED		PERCENT, %	SCORES OR GRADING BASED ON SCALE OF 3	Target> =70%
USN	Name	T1-Q1.a	T1-Q1.b	T1-Q2.a	T1-Q2.b		TOTAL OBTAINED	TOTAL MARKS ATTEMPTED	Η	S C ORF BASED	Ta	Assignment- 1				TOTAL OBTAINED	TOTAL MARKS ATTEMPTED	PE	S C ORE BASED	Ta
1BM13CCT01	ANUSHA S. B.	8	7	8			23	30	77%	3	Y	3				3	5	60.00%	2	
1BM13CCT02	BHAVISH DAS (discontinued after I sem)	5	6	12	8		31	40	78%	3	Y	4				4	5	80.00%	3	Y
1BM13CCT03	DEEPA M NAIK			8	7		15	20	75%	3	Y	5				5	5	100.00 %	3	Y
1BM13CCT04	GOLLAPALLI NIRANJAN REDDY			9	7		16	20	80%	3	Y	4				4	5	80.00%	3	Y
1BM13CCT05	JHANSI RAMA PRIYA			9	9		18	20	90%	3	Υ	4				4	5	80.00%	3	Y
1BM13CCT06	NIRANJANA N	7	6	9	3		25	40	63%	2		4				4	5	80.00%	3	Y
1BM13CCT07	PAVAN J.			9	9		18	20	90%	3	Y	4				4	5	80.00%	3	Y
1BM13CCT08	PRAMODB. V.			10	9		19	20	95%	3	Y	3				3	5	60.00%	2	
1BM13CCT09	PRAVEEN GONGACHI	4	7				11	20	55%	2		4				4	5	80.00%	3	Y
1BM13CCT10	RAJESH A.			9	7		16	20	80%	3	Y	4				4	5	80.00%	3	Y
1BM13CCT11	SALMANPASHA	7	7	6			20	30	67%	2		4				4	5	80.00%	3	Y
1BM13CCT12	SHARATHR.	7	7	8	8		30	40	75%	3	Υ	3				3	5	60.00%	2	
1BM13CCT13	SHRINATH			9	8		17	20	85%	3	Y	4				4	5	80.00%	3	Y
1BM13CCT14	SOWMYAH. V.			9	7		16	20	80%	3	Y	4				4	5	80.00%	3	Y
1BM13CCT15	SUNIL KUMARB. M.		2	7	7		16	30	53%	2		3				3	5	60.00%	2	
1BM13CCT16	VIKAS PRABHAKAR ATTIGERI			9	8		17	20	85%	3	Y	4				4	5	80.00%	3	Y
1BM13CCT17	VIKRAM C GATEGAR			7	8		15	20	75%	3	Υ	4				4	5	80.00%	3	Y
1BM13CCT18	VILASKUMAR S. LONIMATH			8	8		16	20	80%	3	Y	5				5	5	100.00 %	3	Y
							_		SUM	50	14							SUM	50	14

AVG GRADING 2.78

AVG GRADING 2.78

10	10	10	10		40		0	~ ~	~
			CO3		[AL INED	TOTAL MARKS ATTEMPTED	PERCENT, %	SCURES UK GRADING BASED ON SCALE OF 3	Target > =70%
T1-Q3.a	T1-Q3.b	T2-Q2.a	T2-Q2.b		TOTAL OBTAINED	TOTAL MARKS ATTEMPTI	PER	GR GR BAS SCA	Targe
8	7				15	20	75.00%	3	Y
		5	12		17	20	85.00%	3	Y
6	8	8	5		27	40	67.50%	2	
	9				9	10	90.00%	3	Y
9	9				18	20	90.00%	3	Y
-	+	÷	-		0	40	0.00%	1	
-	+	+	-		0	40	0.00%	1	
8	8				16	20	80.00%	3	Y
8	8				16	20	80.00%	3	Y
6	8				14	20	70.00%	3	Y
		7	7		14	20	70.00%	3	Y
-	-	-	-		0	40	0.00%	1	
8	9	8	7		32	40	80.00%	3	Y
9	9				18	20	90.00%	3	Y
5	6				11	20	55.00%	2	
9	8	8	8		33	40	82.50%	3	Y
7	8	8			23	30	76.67%	3	Y
8	9				17	20	85.00%	3	Y
				 	 		SUM	46	13
						AVG GF	RADING	2.56	

COURSE	GRADING AVG ON	DISTRIBUTION %							
OUTCOMES	SCALE OF 3	3	2	1					
CO1	2.78	14 / 18 = 77.77%	4 / 18 = 22.22%	0 / 18 = 0%					
CO2	2.78	14 / 18 = 77.77%	4 / 18 = 22.22%	0 / 18 = 0%					
CO3	2.56	13 / 18 = 72.22%	2 / 18 = 11.11%	3 / 18 = 16.66%					
CO4	2.56	10 / 18 = 55.55%	8 / 18 = 44.44%	0 / 18 = 0%					

TARGET is > = More than 75% of Students Must Achieve 70% Marks.

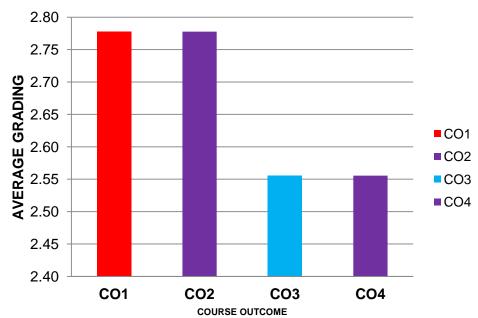
	3	Strongly Related
PO AND CO	2	Moderate
SCALE	1	Low

NUMBER OF STUDENTS SCORING > =70%

COURSE OUTCOMES	% OF STUDENTS ACHIEVED CO	CO RESULT
CO1	77.78%	Y
CO2	77.78%	Y
CO3	72.22%	Ν
CO4	55.56%	Ν

COURSE OUTCOMES	GRADING AVG ON SCALE OF 3	<b>DISTRIBUTION %</b>							
	SCALE OF 5	3	2	1					
CO1	2.78	77.78%	22.22%	0.00%					
CO2	2.78	77.78%	22.22%	0.00%					
CO3	2.56	72.22%	11.11%	16.67%					
CO4	2.56	55.56%	44.44%	0.00%					

**GRADING AVG ON SCALE OF 3** 



# **CO** Attainment

0

- The assessments should be in alignment with the COs
- Question paper should be so set to assess all COs
- The average marks obtained in assessments against items for each CO will indicate the CO attainment.
- Instructors can set targets for each CO of his/her course.
- Attainment gaps can therefore be identified.
- Instructor can plan to reduce the attainment gaps or enhance attainment targets.

- 3.3.1. Describe assessment tools and processes used for measuring the attainment of each of the Program Outcomes and Program Specific Outcomes
  - Describe the assessment tools and processes used to gather the data upon which the evaluation of each of the Program Outcomes and Program Specific Outcomes is based indicating the frequency with which these processes are carried out
  - Describe the assessment processes that demonstrate the degree to which the Program Outcomes and Program Specific Outcomes are attained and document the attainment levels

#### Exhibits/Context to be Observed/Assessed:

A.&B. Direct and indirect assessment tools & processes ; effective compliance; direct assessment methodology, indirect assessment formats-collection analysis; decision making based on direct and indirect assessment

### 3.3.2. Provide results of evaluation of each PO & PSO

- Program shall set Program Outcome attainment levels for all POs and PSOs
- The attainment levels by direct (student performance) and indirect (surveys) are to be presented through Program level Course-PO & PSO matrix as indicated

### **PO Attainment**: *Similar table is to be prepared for PSOs*

- Direct attainment level of a PO & PSO is determined by taking average across all courses addressing that PO and/or PSO.
- Indirect attainment level of PO & PSO is determined based on the student exit surveys, employer surveys, co-curricular activities, extra-curricular activities etc.

#### Exhibits/Context to be Observed/Assessed:

A. & B. Appropriate attainment level and documentary evidences; details for POs & PSOs attainment from core courses to be verified. Also atleast two POs & two PSOs attainment levels shall be verified

## Example:

- It is assumed that a particular PO has been mapped to four courses C2O1, C3O2, C3O3 and C4O1
- 2. PO attainment level will be based on attainment levels of direct assessment and indirect assessment
- 3. For affiliated, non-autonomous colleges, it is assumed that while deciding on overall attainment level 80% weightage may be given to direct assessment and 20% weightage to indirect assessment through surveys from students(largely), employers (to some extent). Program may have different weightages with appropriate justification
- 4. Assuming following actual attainment levels

**Direct Assessment** 

- C201 –High (3)
- C302 Medium (2)
- C303 Low (1)
- C401 High (3)

Attainment level will be summation of levels divided by no. of courses

3+2+1+3/4=9/4=2.25

### **Indirect** Assessment

- Surveys, Analysis, customized to an average value as per levels 1, 2 & 3.
- Assumed level -2
- 5. PO Attainment level will be 80% of Direct Assessment + 20% of Indirect Assessment i.e. 1.8 + 0.4 = 2.2, Moderate/Medium level of attainment

Note: Similarly for PSOs

# PO Attainment – Example..

-					_	_	_					_				
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	<ul> <li>3.3. Attainment of Program Outcomes and Program Specific Outcomes (50)</li> <li>3.3.1. Describe assessment tools and processes used for measuring the attainment of</li> <li>each of the Program Outcomes and Program Specific Outcomes (10)</li> </ul>															<b>^</b>
<b>1</b> 4%																
	(Describe the assessment tools and processes used to gather the data upon which the evaluation of each of the Program Outcomes and Program Specific Outcomes is based															
		in	dicating	the t	frequen	cy with	n which	h these	e proce	esses a	re car	ried ou	t. Desc	ribe the	e	
	assessment processes that demonstrate the degree to which the Program Outcomes and Program Specific Outcomes are attained and document the attainment levels)															
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	3.3.2. Provide results of evaluation of each PO & PSO (40)														ŕ	
Ø	Program shall set Program Outcome attainment levels for all POs & PSOs.															
L.Y.	(The attainment levels by direct (student performance) and indirect (surveys) are to be															
	presented through Program level Course – PO & PSO matrix as indicated).															
																-
	PO Attainment															
		Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12		
		C101														
		C102														

## **Attainment of Pos:**

Course Name	COs	CO Attainment , %	CO Result	PO1	PO2	PO3	РО 4	PO5	PO6	<b>PO</b> 7	PO8	PO9	PO1 0	PO1 1	PO1 2
Analysis of Structures-II	CO1	86.00%	YES	86%	86%	-	-	-	-	-	-	-	-	-	-
	CO2	78.00%	YES	78%	78%	-	-	-	-	-	-	-	-	-	-
	CO1	85.96%	YES	86%	57%	-	86 %	-	86%	86 %	-	-	-	-	-
Environmental Engineering- I	CO2	77.19%	YES	77%	77%	-	-	-	77%	77 %	-	-	77%	-	-
	CO3	91.23%	YES	-	-	91%	-	-	-	91 %	91%	-	91%	-	-
	CO1	70.00%	NO	-	-	-	-	-	-	-	-	-	-	-	-
	CO2	74.00%	NO	-	-	-	-	-	-	-	-	-	-	-	-
Geotechnical Engineering-II	CO3	100.00%	YES	100%	100%	-	-	-	-	-	-	-	-	-	-
	CO4	75.00%	YES	75%	75%	50%	-	-	75%	-	-	-	-	-	-
	<b>CO1</b>	77.78%	YES	77.78 %	-	-	-	-	-	-	-	-	-	-	-
Concrete Technology	CO2	77.78%	YES	-	77.7 8%	77.7 8%	-	-	-	-	-	-	-	-	-
Concrete rechnology	<b>CO3</b>	72.22%	NO	-	-		-	-	-	-	-	-	-	-	-
	<b>CO4</b>	55.56%	NO	-	-	-	-	-	-	-	-	-	-	-	-
Hydrology & Water	CO1	83.00%	YES	83%	83%	-	-	-	-	-	-	-	-	-	-
Resources	CO2	78.00%	YES	78%	78%	-	-	-	-	-	-	-	-	-	-
	CO3	68.00%	NO	-	-	-	-	-	-	-	-	-	-	-	-

### Contd...

	Course Name	COs	CO Attainmen t, %	CO Result	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO</b> 7	PO8	PO9	PO1 0	PO1 1	PO1 2
0		CO1	95.00%	YES	95%	95%	-	32%	-	-	-	-	-	-	-	-
)	Quantity Surveying	CO2	35.00%	NO	-	-	-	-	-	-	-	-	-	-	-	-
	and Costing	CO3	89.00%	YES	89%	89%	-	-	-	-	-	-	-	-	-	-
		CO4	24.00%	NO	-	-	-	-	-	-	-	-	-	-	-	-
		CO1	75.00%	YES	75%		-	-	-	-	75 %		-	-	-	25%
	Alternate Building	CO2	75.00%	YES		75%	-	-	-	-	75 %		-	-	-	75%
	Materials & Technology	CO3	75.00%	YES		-	-	-		-	75 %		-	-	-	50%
		CO4	75.00%	YES			75%	-	50%	-	50 %	75%	-	-	-	-
		CO1	100.00%	YES	-	-	-	-	-	-	100 %	-	100%	-	-	-
	Major	CO2	100.00%	YES	100%	100%	100%	100%	-	-	-	100 %	100%	-	-	100 %
	Project Phase - II	CO3	100.00%	YES	-	-	-	-	100 %	-	-	-	100%	-	-	-
		CO4	100.00%	YES	-	-	-	-	-	-	-	-	100 %	100 %	67%	-
				PO Attai nmen t	80%	78%	72%	84%	72%	83%	71 %	69%	98%	84%	67%	82%

## **Example Weightages for PO**

PO No ·	Attainment Method of Assessment	Dire ct Asse ssme nt (CIE )	Direct Assess ment (SEE)	Stude nt Exit Surve y	Cours e End Surve y	Facu lty Surv ey	PO Attain ment, %
	Weightage PO Description	50%	30%	10%	5%	5%	
РО 1	Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.	38%	22%	7%	4%	4%	76%
PO 2	Identify, formulate, research literature, and analyz e complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.	37%	22%	7%	4%	4%	75%
PO 3	Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.	32%	23%	7%	3%	3%	68%
РО 4	Use research based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.	39%	23%	7%	4%	3%	77%

# **PO-Attainment:** What next?

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5 B																Tools	Comment	Share
	PO	PO	РО	РО		PO	PO	PO	PO	PO	PO	PO	PS	PS				
PO ATTAINMENT	1	2	3	4	5	6	7	8	9	10	11	12	01	02				
	2.	1.	1.	1.	1.	1.	1.	1.	1.									
AVERAGE	4	9	8	8	7	5	4	3	8	1.5	1.3	1.7	1.8	1.4				
	1.	1.	1.	1.	1.	1.	1.	1.	1.									
80% OF DA	9	5	4	5	3	2	1	0	5	1.2	1.1	1.4	1.4	1.1				
															-			
	PO	PO	PO	PS	PS													
ACTIVITIES	1	2	3	4	5	6	7	8	9	10	11	12	01	02				
	1.	1.	1.	1.	1.	1.	1.	1.	1.									
Average	0	1	5	0	2	2	1	1	2	1.0	1.3	1.3	1.5	1.5				
10% OF ACTIVITY CHART	0.	0.	0.	0.	0.	0.	0.	0.	0.									
ATTAINMENT	1	1	1	1	1	1	1	1	1	0.1	0.1	0.1	0.1	0.1				

	PO	РО	PO	PS	PS									
INDIRECT ATTAINMENT	1	2	3	4	5	6	7	8	9	10	11	12	01	02
Average	1.	4.	7.	3.	1.	7.	3.	2.	6.	76	26	2.3	2.0	1.4
Average	1	5	3	0	7	6	4	6	7	7.6	2.6	2.5	2.0	1.4
10% OF IDA	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.8	0.3	0.2	0.2	0.1
10% OF IDA	1	4	7	3	2	8	3	3	7	0.0	0.5	0.2	0.2	0.1

	PO	PO	PO	PO	PS	PS								
OVERALL ATTAINMENT	1	2	3	4	5	6	7	8	9	10	11	12	01	02
	1.	1.	1.	1.	1.	1.	1.	1.	1.					
80% OF DA	9	5	4	5	3	2	1	0	5	1.2	1.1	1.4	1.4	1.1
10% OF ACTIVITY CHART	0.	0.	0.	0.	0.	0.	0.	0.	0.					
ATTAINMENT	1	2	2	2	2	2	2	2	0	0.1	0.1	0.2	0.0	0.2
10% OF IDA	0. 1	0. 4	0. 7	0. 3	0. 2	0. 8	0. 3	0. 3	0. 7	0.8	0.3	0.2	0.2	0.1
	2.	2.	2.	1.	1.	2.	1.	1.	2.					
TOTAL	2	1	3	9	7	1	6	5	2	2.1	1.5	1.8	1.7	1.4



# **PO Attainment**

- All POs can be adequately addressed through the selection of core courses and their COs
- > Attainable targets can be selected for each of the CO.
- If assessment is in alignment with COs the performance of the students indicates the CO attainment.
- These measurements provide the basis for continuous improvement in the quality of learning.

### **CRITERION 4: Students' Performance**

\_\_\_\_\_

<b>Item</b> (Information-cumulatively for all the shifts with explicit headings)	CAY	CAYm1	CAYm2
Sanctioned intake of the program (N)			
Total number of students admitted in first year minus number of students migrated to other programs/institutions plus no. of students migrated to this program (N1)			
Number of students admitted in 2nd year in the same batch via lateral entry (N2)			
Separate division students, if applicable (N3)			
Total number of students admitted in the Program $(N1 + N2 + N3)$			

Year of entry	N1 + N2 + N3 (As defined above)	graduated year of stud (Without E	without bac dy Backlog mea	who have s klogs in any ans no comp r/year of stud	semester /
		I Year	II Year	III Year	IV Year
CAY					
CAYm1					
CAYm2					
CAYm3 (LYG)					
CAYm4 (LYGm1)					
CAYm5 (LYGm2)					

### 4.1. Enrolment Ratio (20)

### Enrolment Ratio= N1/N

Item (Students enrolled at the First Year Level on average basis during the period of assessment)	Marks
>= 90% students	20
>= 80% students	18
>= 70% students	16
>= 60% students	14
Otherwise	0

#### Exhibits/Context to be Observed/Assessed:

A. B. & C. Data to be verified for each of the assessment years

For Example from data entry perspective:

Item (Information to be provided cumulatively for all the shifts with explicit headings, wherever applicable)	CAY (2016-17)	CAYm1 (2015-16)	CAYm2 (2014-15)
Sanctioned intake of the program (N)	120	120	120
Total number of students admitted in first year <i>minus</i> number of students migrated to other programs/institutions plus no. of students migrated to this program ( <i>N</i> 1)	100	100	110
Number of students admitted in 2nd year in the same batch via lateral entry $(N2)$	Nil	24	24
Separate division (N3)	Nil	Nil	Nil
Total number of students admitted in the Program ( $N1 + N2 + N3$ )	124	124	134

Year of entry	N1 + N2 + N3 (As defined above)	Number of students who have successfully graduated without backlogs in any semester/year of study							
		I Year	II Year	III Year	IV Year				
CAY (2016-17)	100 (100+0+0)								
CAY (2015-16)	124(100+24+0)	60							
CAYm1 (2014-15)	124 (100+24+0)	50	40+20						
CAYm2 (2013-14)	134 (110+24+0)	90	80+20	70+20					
CAYm3 (LYG) (2012-13)	124 (100+24+0)	100	90+20	85+18	85+15				
CAYm4 (LYGm1) (2011-12)	130 (120+10+0)	80	70+10	60+10	50+10				
CAYm5 (LYGm2)(2010-11)	144 (120+24+0)	70	60+15	54+10	50+10				

Year of entry	N1 + N2 + N3 (As defined above)	S	uccessful ts with ba	dents who y graduate ocklog in sti of study)	d
		I Year	II Year	III Year	IV Year
CAY (2016-17)	124 (100+0+0)				
CAY (2015-16)	124 (100+24+0)	40			
CAYm1 (2014-15)	124 (100+24+0)	50	45+4		
CAYm2 (2013-14)	134 (110+24+0)	20	20+4	15+3	

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CAYm3 (LYG) (2012-13)	124 (100+24+0)	0	0+4	5+4	5+4
CAYm4 (LYGm1) (2011-12)	130 (120+10+0)	30	30+10	25+4	50+10
CAYm5 (LYGm2) (2010-11)	144 (120+24+0)	30	25+5	25+5	20+5

4.1. Enrolment Ratio (20) Enrolment Ratio= N1/N

Item (Students enrolled at the First Year Level on average basis during the previous three academic years starting from current academic year)	Marks
>=90% students enrolled	20
>=80% students enrolled	18
>=70% students enrolled	16
>=60% students enrolled	14
>=50% students enrolled	12
Otherwise	0

Table B.4.1

### 4.2. Success Rate in the stipulated period of the program

4.2.1. Success rate without backlogs in any semester/year of study Enrolment Ratio
SI = (Number of students who have graduated from the program without backlog)/
(Number of students admitted in the first year of that batch and admitted in 2nd year
via lateral entry and separate division, if applicable)

Average SI = Mean of Success Index (SI) for past three batches Success rate without backlogs in any year of study = 25 × Average SI

#### Exhibits/Context to be Observed/Assessed:

Data to be verified for each of the assessment years

### 4.2.2. Success rate in stipulated

**SI** = (Number of students who graduated from the program in the stipulated period of course duration)/ (Number of students admitted in the first year of that batch and admitted in 2nd year via lateral entry and separate division, if applicable)

Average SI = mean of Success Index (SI) for past three batches Success rate = 15 × Average SI.

*Note:* If 100% students clear without any backlog then also total marks scored will be 40 as both 4.2.1 & 4.2.2 will be applicable simultaneously

#### Exhibits/Context to be Observed/Assessed:

Data to be verified for each of the assessment years

*Note:* If 100% students clear without any backlog then also total marks scored will be 40 as both 4.2.1 & 4.2.2 will be applicable simultaneously.

### **4.3. Academic Performance in Third Year**

Academic Performance = 1.5 \* Average API (Academic Performance Index) API = ((Mean of 3rd Year Grade Point Average of all successful Students on a 10)point scale) or (Mean of the percentage of marks of all successful students in Third Year/10)) x (number of successful students/number of students appeared in the examination)

### Exhibits/Context to be Observed/Assessed:

Data to be verified for atleast one of the assessment years.

### 4.4. Academic Performance in Second Year

Academic Performance Level = 1.5 \* Average API (Academic Performance Index) API = ((Mean of 2nd Year Grade Point Average of all successful Students on a 10)point scale) or (Mean of the percentage of marks of all successful students in Second Year/10)) x (number of successful students/number of students appeared in the examination)

### Exhibits/Context to be Observed/Assessed:

Data to be verified for atleast one of the assessment years.

### 4.5. Placement, Higher Studies and Entrepreneurship

Assessment Points =  $40 \times$  average placement

Item	CAY	CAYm1	CAYm2
Total No. of Final Year Students (N)			
No. of students placed in companies or Government Sector (x)			
No. of students admitted to higher studies <b>with valid qualifying</b> <b>scores</b> (GATE or equivalent State or National Level Tests, GRE, GMAT etc.) (y)			
No. of students turned entrepreneur in <b>engineering / technology</b> (z)			
x + y + z =			
Placement Index : $(x + y + z)/N$		P2	P3
Average placement= $(P1 + P2 + P3)/3$			

#### Exhibits/Context to be Observed/Assessed:

Data to be verified for atleast one of the assessment years.

### 4.6. Professional Activities

4.6.1. Professional societies/chapters and organizing engineering events

Relevant documentary evidences

- Professional Society/Chapters
- No. and Quality of Engineering events organized

(Level - Institute/State/National/International)

### Exhibits/Context to be Observed/Assessed:

Self - Explanatory.

### 4.6.2. Publication of technical magazines, newsletters, etc.

The Department publications along with the names of the editors, publishers, etc.

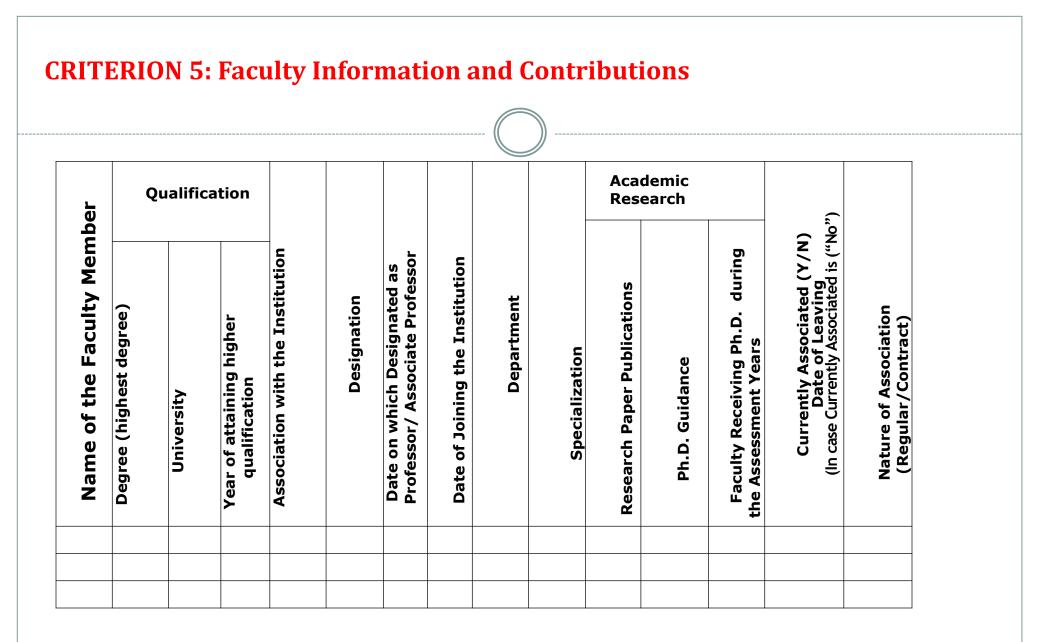
- Quality and relevance of the contents and print material
- Participation of students from the program

### Exhibits/Context to be Observed/Assessed:

- A. Documentary evidence
- B. Documentary evidence Students participation (also to be confirmed during interaction with the students)
- 4.6.3 Participation in inter-institute events by students of the program of study Awards in the events/conferences organized by other institutes
  - Within the State
  - Outside the State
  - Prized/Awards received

### Exhibits/Context to be Observed/Assessed:

A.B. & C. Quality of events and documentary evidence



**5.1. Student-Faculty Ratio (SFR)** (To be calculated at **Department** Level) No. of UG Programs in the Department (n): \_\_\_\_\_ No. of PG Programs in the Department (m): \_\_\_\_\_ No. of Students in UG 2nd Year= u1 No. of Students in UG 3rd Year= u2 No. of Students in UG 4th Year= u3 No. of Students in PG 1st Year= p1 No. of Students in PG 2nd Year= p2 **N**o. of Students = Sanctioned Intake + Actual admitted lateral entry students (The above data to be provided considering all the UG and PG programs of the department) S=Number of Students in the Department = UG1 + UG2 +... + UGn + PG1 + ... PGn **F** = Total Number of Faculty Members in the Department (excluding first year faculty) Student Teacher Ratio (STR) = S / F

Year	CAY	CAYm1	CAYm2
u1.1			
u1.2			
u1.3			
UG1	u1.1+u1.2+u1.3	u1.1+u1.2+u1.3	u1.1+u1.2+u1.3
 un.1			
u <sub>n</sub> .2			
u <sub>n</sub> .3			
UGn	u <sub>n</sub> .1+u <sub>n</sub> .2+u <sub>n</sub> .3	un.1+un.2+un.3	un.1+un.2+un.3
p1.1			
p1.2			
PG1	p1.1+p1.2	p1.1+p1.2	p1.1+p1.2
•••••			
pm.1			
pm.2			
PGm	pn.1+pn.2	pn.1+pn.2	pn.1+pn.2
Total No. of Students in the Department (S)	UG1 + UG2 + +UGn + PG1 + PGn	UG1 + UG2 + +UGn + PG1+ + PGn	UG1 + UG2 + +UGn + PG1+ + PGn
No. of Faculty in the Department (F)	F1	F2	F3
Student Faculty Ratio (SFR)	SFR1=S1/F1	SFR2= S2/F2	SFR3= S3/F3
Average SFR	SFR=(SFR1+SFR		

### \* REGULAR Means –

- Full time on roll with prescribed pay scale. An employee on contract for a period of more than two years AND drawing consolidated salary equal or higher than applicable gross salary shall only be counted as a regular employee
- Prescribed pay scales means pay scales notified by the AICTE/Central Government and implementation as prescribed by the State Government. In case State Government prescribes lesser consolidated salary for a particular cadre then same will be considered as reference while counting faculty as a regular faculty

Marks to be given proportionally from a maximum of 20 to a minimum of 10 for average SFR between 15:1 to 25:1, and zero for average SFR higher than 25:1. Marks distribution is given as below:

- < = 15 20 Marks
- < = 17 18 Marks
- < = 19 16 Marks
- < = 21 14 Marks
- < = 23 12 Marks
- < = 25 10 Marks
- > 25 0 Marks

#### Exhibits/Context to be Observed/Assessed:

- SFR is to be verified considering the faculty of the entire department.
- No. of Regular faculty calculation considering Regular faculty definition\*; Faculty appointment letters, time table, subject allocation file, salary statements.
- No. of students calculation as mentioned in the SAR(please refer table under criterion 5.1)
- Faculty Qualification as per AICTE guidelines shall only be counted
- \*Note: Minimum 75% should be Regular/ full time faculty and the remaining shall be Contractual Faculty as per AICTE norms and standards.

The contractual faculty (doing away with the terminology of visiting/adjunct faculty, whatsoever) who have taught for 2 consecutive semesters in the corresponding academic year on full time basis shall be considered for the purpose of calculation in the Student Faculty Ratio.

### **5.2. Faculty Cadre Proportion**

The reference Faculty cadre proportion is 1(F1):2(F2):6(F3)

Cadre Proportion Marks = 
$$\begin{bmatrix} AF1 \\ RF1 \end{bmatrix} + \begin{bmatrix} AF2 & x & 0.6 \\ RF2 \end{bmatrix} + \begin{bmatrix} AF3 & x & 0.4 \\ RF3 \end{bmatrix} = x \quad 12.5$$

- If AF1 = AF2 = 0 then zero marks
- Maximum marks to be limited if it exceeds 25

**Example**: Intake = 180; Required number of Faculty: 12; RF1= 1, RF2=2 and RF3=9

```
Case 1: AF1/RF1= 1; AF2/RF2 = 1; AF3/RF3 = 1;
```

```
Cadre proportion marks = (1+0.6+0.4) \times 12.5 = 25
```

```
Case 2: AF1/RF1= 1; AF2/RF2 = 3/2; AF3/RF3 = 8/9;
```

Cadre proportion marks =  $(1+0.9+0.3) \times 12.5 =$  **limited to 25** 

**Case 3:** AF1/RF1=0; AF2/RF2=1/2; AF3/RF3=11/9; **To be observed carefully** 

Cadre proportion marks =  $(0+0.3+0.49) \times 12.5 = 9.87$ 

- (Faculty Qualification and experience required for cadre posts shall only be considered as per AICTE norms/guidelines)
- Cadre wise No. of faculty available; Faculty qualification and experience and eligibility; Appointment/Promotion orders
- Cadre wise no. of faculty required as per AICTE guidelines (refer calculation in SAR)

### **5.3. Faculty Qualification**

 $FQ = 2.5 x [{10X + 4Y}/F]$  where

X is no. of faculty with Ph.D.,

- Y is no. of faculty with M.Tech,
- F is no. of faculty required to comply 1:20 Faculty Student ratio

(no. of faculty and no. of students required to be calculated as per 5.1)

*Exhibits/Context to be Observed/Assessed: Documentary evidence – Faculty Qualification* 

### **5.4. Faculty Retention**

No. of regular faculty members in CAYm2= CAYm1= CAY=

<b>Item</b> (During the period of assessment keeping CAYm2 as base year)		
>=90% of required Faculty members retained		
>=75% of required Faculty members retained		
>=60% of required Faculty members retained		
>=50% of required Faculty members retained 10		
<50% of required Faculty members retained	0	

### Exhibits/Context to be Observed/Assessed:

Faculty date of joining; atleast three month (July-April-May) salary statement for each of the assessment years

### **5.5. Innovations by the Faculty in Teaching and Learning**

Contributions to teaching and learning are activities that contribute to the improvement of student learning. These activities may include innovations not limited

to-

- Use of ICT
- Instruction delivery
- Instructional methods
- Assessment
- Evaluation and inclusive class rooms that lead to effective, efficient and engaging instruction

- A. Availability on Institute website; awareness among faculty and students of the department
- B.& C. Self-explanatory
- D. Innovations that contribute to the improvement of student learning, typically include use of ICT, instruction delivery, instructional methods, assessment, evaluation etc.

### 5.6. Faculty as participants in Faculty development / training activities/ STTPs

- A Faculty scores maximum five points for participation
- Participation in 2 to 5 days Faculty development program: 3 Points
- Participation >5 days Faculty development program: 5 points

Nome of the Feerlar	Max. 5 per Faculty			
Name of the Faculty	CAY	CAYm1	CAYm2	
Sum				
<i>RF</i> = Number of Faculty required to comply with 20:1 Student-Faculty ratio as per 5.1				
Assessment = $3 \times (Sum/0.5RF)$ (Marks limited to 15)				
Average assessment over three years (Marks limited to 15) =				

- *Relevance of the training/development programme*
- No. of days; No. of faculty

### **5.7. Research and Development**

### 5.7.1. Academic Research

Academic research includes research paper publications, Ph.D. guidance, and faculty receiving Ph.D. during the assessment period.

- Number of quality publications in refereed/SCI Journals, citations, Books/Book Chapters etc.
- Ph.D. guided /Ph.D. awarded during the assessment period while working in the institute

- A. Quality of publications; publications copy
- B. Documentary evidence

- 5.7.2. Sponsored Research
- Funded research from outside
- Provide a list with Project Title, Funding Agency, Amount and Duration Funded research from outside; Cumulative during CAYm1, CAYm2 and CAYm3 Amount > 20 Lakh - 5 Marks Amount  $\geq 16$  Lakh and  $\leq 20$  Lakh -4 Marks Amount  $\geq 12$  Lakh and < 16 Lakh -3 Marks Amount  $\geq 8$  Lakh and < 12 Lakh -2 Marks Amount  $\geq 4$  Lakh and < 8 Lakh -1 Mark Amount < 4 Lakh -0 Mark

### Exhibits/Context to be Observed/Assessed:

Documentary evidence; Funding agency, Amount, Duration, Research progress; Outcome

### 5.7.3. Development activities

Provide details:

- Product Development
- Research laboratories
- Instructional materials
- Working models/charts/monograms etc.

### Exhibits/Context to be Observed/Assessed:

Self explanatory

### 5.7.4. Consultancy (from Industry)

Provide a list with Project Title, Funding Agency, Amount and Duration

Consultancy; (Cumulative during CAYm1, CAYm2 and CAYm3) Amount > 10 Lakh -5 Marks Amount >= 8 Lakh and <= 10 Lakh -4 Marks Amount >= 6 Lakh and < 8 Lakh -3 Marks Amount >= 4 Lakh and < 6 Lakh -2 Marks Amount >= 2 Lakh and < 4 Lakh -1 Mark Amount < 2 Lakh -0 Mark

### Exhibits/Context to be Observed/Assessed:

Documentary evidence; Funding agency, Amount, Duration, Research progress; Outcome

### **5.8. Faculty Performance Appraisal and Development System (FPADS)**

The assessment is based on:

- A well-defined system for faculty appraisal for all the assessment years
- Its implementation, transparency and effectiveness

- A. Notified performance appraisal and development system; Appraisal Parameters; Awareness
- B. Implementation, Transparency and Effectiveness

### 5.9. Visiting/Adjunct/Emeritus Faculty etc.

Adjunct faculty also includes Industry experts. Provide details of participation and contributions in teaching and learning and /or research by visiting / adjunct / Emeritus faculty etc. for all the assessment years:

- Provision of inviting visiting/adjunct /Emeritus faculty
- Minimum 50 hours per year interaction with adjunct faculty from industry/retired professors etc.

Exhibits/Context to be Observed/Assessed:

Documentary evidence

### **CRITERION 6: Facilities and Technical Support**

### 6.1. Adequate and well equipped laboratories, and technical manpower

				Weekly utilization status (all the courses for which the lab is utilized)	Technical Manpower support		
S Z	Name of the Laboratory	No. of students per setup (Batch Size)	Name of the Important equipment		Name of the technical staff	Designat ion	Qualification
1.							
Ν.							

- A. Adequate well-equipped laboratories to run all the programspecific curriculum (20)
- B. Availability of adequate technical supporting staff (5)
- C. Availability of qualified technical supporting staff (5)

#### Exhibits/Context to be Observed/Assessed:

A. Adequacy; well-equipped laboratories; utilization B. & C. Self - explanatory

# 6.2. Additional facilities created for improving the quality of learning experience in laboratories

Sr. No.	Facility Name	Details	Reason(s) for creating facility	Utilization	Areas in which students' are expected to have enhanced learning	Relevance to POs/PSOs
1.						
N.						

- A. Availability and relevance of additional facilities(10)
- B. Facilities utilization and effectiveness (10)
- C. Relevance to POs and PSOs (5)

#### Exhibits/Context to be Observed/Assessed:

Self-explanatory

### **6.3. Laboratories: Maintenance and overall ambiance**

Maintenance and overall ambience Self-Explanatory

### **6.4. Project laboratory**

Mention facility & Utilization

### **6.5. Safety measures in laboratories**

Sr.	Name of the Laboratory	Safety measures
No.		
1.		
Ν.		

## **CRITERION 7: Continuous Improvement**

7.1. Actions taken based on the results of evaluation of each of the POs & PSOs

- Identify the areas of weaknesses in the program based on the analysis of evaluation of POs & PSOs attainment levels
- Measures identified and implemented to improve POs & PSOs attainment levels for the assessment years

# **Examples of analysis and proposed action Sample 1:**

- Course outcomes for a laboratory course did not measure up, as some of the lab equipment did not have the capability to do the needful (e.g., single trace oscilloscopes available where dual trace would have been better, or, non availability of some important support software etc.)
- Action taken-Equipment up-gradation was carried out (with details of upgradation)

# Sample 2:

- In a course on EM theory student performance has been consistently low with respect to some COs
- Analysis of answer scripts and discussions with the students revealed that this could be attributed to a weaker course on vector calculus
- Action taken-revision of the course syllabus was carried out (instructor/text book changed too has been changed, when deemed appropriate)

# Sample 3:

- In a course that had group projects it was determined that the expectations from this course about PO3 (like: "to meet the specifications with consideration for the public health and safety, and the cultural, societal, and environmental considerations") were not realized as there were no discussions about these aspects while planning and execution of the project
- Action taken- Project planning, monitoring and evaluation included in rubrics related to these aspects

# POs & PSOs Attainment Levels and Actions for improvement – CAY

	Target Level	Attainment Level	Observations
<b>PO1: Engineering knowledge:</b> Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.			
Action 1: Action n:			
<b>PO2: Problem analysis:</b> Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering Sciences			

Similar Tables should be presented for all POs & PSOs

Exhibits/Context to be Observed/Assessed:

Documentary evidence in respect of each of the POs

# 7.2. Academic Audit and actions taken thereof during the period of Assessment

• Assessment shall be based on conduct and actions taken in relation to Continuous Improvement

#### Exhibits/Context to be Observed/Assessed:

Academic Audit assessment criteria, frequency, conduct mechanism, action plan based on audit, implementation and effectiveness

# 7.3. Improvement in Placement, Higher Studies and Entrepreneurship

Assessment is based on improvement in:

- Placement: number, quality placement, core industry, pay packages etc.
- Higher studies: performance in GATE, GRE, GMAT, CAT etc., and admissions in premier institutions
- Entrepreneurs

### Exhibits/Context to be Observed/Assessed:

A. B. & C. Nos. in each year of the assessment; improvement considering CAYm3 as a base year

# **7.4. Improvement in the quality of students admitted to the program**

Assessment is based on improvement in terms of ranks/score in qualifying-

- State level/National level entrances tests
- Percentage marks in Physics, Chemistry and Mathematics in 12th Standard
- Percentage marks of the lateral entry students

#### Exhibits/Context to be Observed/Assessed:

A. Documentary evidence – list of students admitted; admission authority guidelines; ranks/scores; comparative status considering CAYm3 as a base year

#### **CRITERION 8: First Year Academics**

# 8.1. First Year Student-Faculty Ratio (FYSFR)

Assessment =  $(5 \times 15)$ /Average FYSFR (Limited to Max. 5) For each year of assessment =  $(5 \times 20)$ / FYSFR (Limited to Max. 5) Average of Assessment of data in CAY, CAYm1 and CAYm2 \*Note: If FYSFR is greater than 25, then assessment equal to zero.

#### Exhibits/Context to be Observed/Assessed:

- No. of Regular faculty calculation considering Regular faculty definition and fractional load; Faculty appointment letters; Salary statements
- No. of students calculation as mentioned in the SAR

### **CRITERION 8: First Year Academics**

# 8.2. Qualification of Faculty Teaching First Year Common Courses

Assessment of qualification = (5x + 3y)/RFx= Number of Regular Faculty with Ph.D y = Number of Regular Faculty with Post-graduate qualification RF= Number of faculty members required as per SFR of 20:1

Exhibits/Context to be Observed/Assessed:

Documentary evidence – Faculty Qualification

## 8.3. First Year Academic Performance

Academic Performance = ((Mean of 1st Year Grade Point Average of all successful Students on a 10 point scale) or (Mean of the percentage of marks in First Year of all successful students/10)) x (number of successful students/number of students appeared in the examination)

Successful students are those who are permitted to proceed to the Second year

#### Exhibits/Context to be Observed/Assessed:

Data to be verified for atleast one of the assessment years

# **8.4. Attainment of Course Outcomes of first year courses**

8.4.1. Describe the assessment processes used to gather the data upon which the evaluation of Course Outcomes of first year is done

Examples of data collection processes may include, but are not limited to –

- Specific exam questions
- Laboratory tests
- Internally developed assessment exams
- Oral exams
- Assignments
- Presentations
- Tutorial sheets etc.

### Exhibits/Context to be Observed/Assessed:

A. & B. Direct and indirect assessment(if applicable), tools & processes; effective compliance; direct assessment methodology, indirect assessment formats-collection-analysis; decision making

# 8.4.2. Record the attainment of Course Outcomes of all first year courses *Program shall have set attainment levels for all first year courses.*

- The attainment levels shall be set considering average performance levels in the University Examination or any higher value set as target for the assessment years.
- Attainment level is to be measured in terms of student performance in internal assessments with respect the COs of a subject plus the performance in the University examination

A. Verify the records as per the benchmark set for the courses (5)
 *Exhibits/Context to be Observed/Assessed:*

Documentary evidence – Attainment for atleast 3 courses

# **8.5. Attainment of Program Outcomes of all first year courses**

8.5.1. Indicate results of evaluation of each relevant PO and/or PSO, if applicable

- The relevant program outcomes that are to be addressed at first year need to be identified by the institution
- Program Outcome attainment levels shall be set for all relevant POs and/or PSOs through first year courses

COURSE	COs	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	<b>PO8</b>	PO9	PO10	PO11
C101												
C102												
•••												
Direct Attainment												

### Exhibits/Context to be Observed/Assessed:

A. & B. Documentary evidence for each relevant PO/PSO

8.5.2. Actions taken based on the results of evaluation of relevant POs

The attainment levels by direct (student performance) are to be presented through

Program level Course-PO matrix as indicated

## **PO Attainment Levels and Actions for improvement CAY**

	Target Level	Attainment Level	Observations
<b>PO1: Engineering knowledge:</b> Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.			
Action 1: Action n:			
<b>PO2: Problem analysis:</b> Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering Sciences			

### Note: PSOs, if applicable to be added appropriately

Exhibits/Context to be Observed/Assessed:

A. & B. Documentary evidence for each relevant PO/PSO

## **CRITERION 9: Student Support Systems**

# 9.1 Mentoring system to help at individual level

- Type of mentoring: Professional guidance / career advancement / course work specific / laboratory specific / all-round development
- Number of faculty mentors
- Number of students per mentor
- Frequency of meeting

#### Exhibits/Context to be Observed/Assessed:

A. Mentoring system terms of reference; implementation; effectiveness (also to be verified during interaction with the students)

## **CRITERION 9: Student Support Systems**

# 9.2. Feedback analysis and reward /corrective measures taken, if any

- Feedback collected for all courses: YES/NO
- Feedback questionnaire
- Specify the feedback collection process
- Average Percentage of students who participated
- Specify the feedback analysis process
- Basis of reward / corrective measures, if any: Indices used for measuring quality of teaching and learning
- Summary of the index values for all courses/teachers
- Number of corrective actions taken

#### Exhibits/Context to be Observed/Assessed:

A. Feedback questions, collection process, analysis, actions taken, effectiveness

# 9.3. Feedback on facilities

Assessment is based on -

- Feedback collection
- Analysis and corrective action taken

# 9.4. Self Learning

The institution needs to specify –

- Facilities
- Materials
- Scope for self-learning / learning beyond syllabus
- Webinars
- Podcast
- MOOCs
- Evaluate effectiveness

# 9.5. Career Guidance, Training, Placement

The institution may specify –

- Facility
- Management
- Effectiveness for career guidance including counseling for higher studies
- Campus placement support
- Industry interaction for training/internship/placement, etc.

## Exhibits/Context to be Observed/Assessed:

Availability, implementation, effectiveness (also to be verified during interaction with the students)

# 9.6. Entrepreneurship Cell

The institution may specify –

- Facility
- Management
- Effectiveness in encouraging entrepreneurship and incubation
- Success stories for each of the assessment years

## Exhibits/Context to be Observed/Assessed:

Availability, implementation, effectiveness (also to be verified during interaction with the students)

# 9.7. Co-curricular and Extra-curricular Activities

The institution may specify –

- Co-curricular and extra-curricular activities
- A. Availability of sports and cultural facilities (3)
- B. NCC, NSS and other clubs (3)
- C. Annual students activities (4)

## Exhibits/Context to be Observed/Assessed:

Availability, implementation, effectiveness (also to be verified during interaction with the students)

## **CRITERION 10: Governance, Institutional Support and Financial Resources**

# **10.1 Organization, Governance and Transparency**

## 10.1.1. State the Vision and Mission of the Institute

Vision statement typically indicates aspirations and Mission statement states the broad approach to achieve aspirations

- Availability
- Appropriateness/relevance

#### Exhibits/Context to be Observed/Assessed:

- A. Institute Vision and Mission statements: Availability of statements on Institute website; Availability at Central facilities such as Library, Computer Center, Principal Chamber etc. Availability of one set of statements in each of the departments; Availability in Institute level documents
- B. Correctness from definition perspective

### **CRITERION 10: Governance, Institutional Support and Financial Resources**

10.1.2. Governing body, administrative setup, functions of various bodies, service rules, procedures, recruitment and promotional policies

- List the governing, senate, and all other academic and administrative bodies; their memberships, functions, and responsibilities; frequency of the meetings; and attendance therein
- The published rules including service rules, policies and procedures; year of publication shall be listed
- Minutes of the meetings, Action taken reports, extent of awareness among the employees/students

**Exhibits/Context to be Observed/Assessed:** Self explanatory

# 10.1.3. Decentralization in working and grievance redressal mechanism

- List the names of the faculty members who have been delegated powers for taking administrative decisions
- Grievance Redressal cell
- Action taken report for the above point

## Exhibits/Context to be Observed/Assessed:

A. B. & C. Documentary evidence

# 10.1.4. Delegation of financial powers

- Institution should explicitly mention financial powers delegated to the Principal, Heads of Departments and relevant in-charges
- Demonstrate the utilization of financial powers for each year of the assessment years

## Exhibits/Context to be Observed/Assessed:

- A. Circulars notifying financial powers
- B. Documentary evidence to exhibit utilization at each levels during assessment years

- 10.1.5. Transparency and availability of correct/unambiguous information in public domain
  - Information on policies, rules, processes and dissemination of this information to stakeholders is to be made available on the web site
  - Disseminating of information about student, faculty and staff

## Exhibits/Context to be Observed/Assessed:

A. & B. Website and Documentary evidence

# **10.2. Budget Allocation, Utilization, and Public Accounting at Institute** level

Summary of current financial year's budget and actual expenditure incurred (for

the institution exclusively) in the three previous financial years.

Total Income at Institute level: For CFY, CFYm1, CFYm2 & CFYm3

For CFY: Similar tables are to be prepared for CFYm1, CFYm2 & CFYm3

	Та	otal Income		Actua	Total No. of students:		
Fee	Govt.	Grant(s)	Other Sources (specify)	Recurring including Salaries	Non recurring	Special Projects/Any other, specify	Expenditure per student

Items	Budgeted in CFY	Actual expenses in CFY (till)	Budgeted in CFYm1	Actual Expenses in CFYm1	Budgeted in CFYm2	Actual Expenses in CFYm2	Budgeted in CFYm3	Actual Expenses in CFYm3
Infrastructure								
Built-Up								
Library								
Laboratory								
equipment								
Teaching and non- teaching staff salary								
R&D								
Laboratory consumables								
Maintenance and spares								
Training and Travel								
Miscellaneous expenses								
Others Specify								
Total								

10.2.1 Adequacy of budget allocation

- The institution needs to justify that the budget allocated over the years was adequate
- A. Quantum of budget allocation for three years (5)
- B. Justification of budget allocated for three years (5)

## Exhibits/Context to be Observed/Assessed:

- A. Budget formulation, finalization and approval process
- $B. \quad Requirement-allocation-adequacy-justification\ thereof$

# 10.2.2 Utilization of allocated funds

• The institution needs to state how the budget was utilized during assessment years

## Exhibits/Context to be Observed/Assessed:

A. Balance sheet; effective utilization; random verification for atleast two of the three assessment years

## 10.2.3 Availability of the audited statements on the institute's website

• The institution needs to make audited statements available on its website.

#### Exhibits/Context to be Observed/Assessed:

A. Website

# **10.3 Program Specific Budget Allocation, Utilization**

Total Budget at program level: For CFY, CFYm1, CFYm2 & CFYm3

## 10.3.1. Adequacy of budget allocation

Program needs to justify that the budget allocated over the assessment years was adequate for the program

### Exhibits/Context to be Observed/Assessed:

- A. Budget formulation, finalization and approval process
- B. Requirement allocation –adequacy justification thereof

### 10.3.2. Utilization of allocated funds

Program needs to state how the budget was utilized during the last three assessment years

#### Exhibits/Context to be Observed/Assessed:

A. Balance sheet; effective utilization; random verification for atleast two of the three assessment years

# **10.4. Library and Internet**

- AICTE zero deficiency report for all the assessment years
- Effective availability
- Purchase records
- Utilization of facilities
- Documentation

# 10.4.1. Quality of learning resources (hard/soft)

- Relevance of available learning resources including e-resources
- Accessibility to students

## Exhibits/Context to be Observed/Assessed:

Availability; Adequacy; Effectiveness (Also to be verified during interactions with the faculty and students)

# 10.4.2. Internet

- Name of the Internet provider
- Available bandwidth
- Wi Fi availability
- Internet access in labs, classrooms, library and offices of all Departments
- Security arrangements

## Exhibits/Context to be Observed/Assessed:

Availability as per AICTE norms; Adequacy; Effectiveness (Also to be verified during interactions with the faculty and students)

