SELF ASSESSMENT REPORT (SAR)
TIER - II UG Engineering Programs
First Time Accreditation

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PART B - CRITERIA SUMMARY

Criteria No.	Criteria	Marks
Programme level Criteria		
1.	Vision, Mission and Program Educational Objectives	60
2.	Program Curriculum and Teaching – Learning Processes	120
3.	Course Outcomes and Program Outcomes	120
4.	Students' Performance	150
5.	Faculty Information and Contributions	200
6.	Facilities and Technical Support	80
7.	Continuous Improvement	50
Institute Level Criteria		
8.	First Year Academics	50
9.	Student Support Systems	50
10.	Governance, Institutional Support and Financial Resources	120

Criteria -3

3. Course Outcomes and Program Outcomes

Definitions

- **Course Outcomes (CO):** Student is expected to know and be able to do at the end of each course (Narrower Statements).
- **Program Specific Outcomes (PSO):** What the graduates of a ***specific UG Program*** should be able to do at the time of graduation.
- **Program outcomes (PO):** What the graduates of a ***UG Program*** should be able to do at the time of graduation.
- **Program Education Objectives (PEO)**:Preparing the graduates to attain career and professional accomplishments within a few year (3-5 years) of graduation

3.1-Establish the correlation between the Courses Outcomes and the Program Outcomes (POs) and Program Specific Outcomes (PSOs) (20)

- **3.1.1. Course Outcomes (COs)**

✓ SAR should ***include*** Course Outcomes of ***One course/Semester*** (3rd to 8th) of study,

✓ However prepare CO for all courses and made available as evidence, if asked) (05)

- Number of Outcomes for a Course is expected to be around 4-6.

Course Outcomes (CO): Students expected to know and be able to do at the end of each course

Digital Logic Circuit Design

1) Apply knowledge of number systems, codes and Boolean algebra to the analysis and design of digital logic circuits
2) Identify, formulate, and solve engineering problems in the area of digital logic circuit design
3) Use the techniques, skills, and modern engineering tools such as logic works and VHDL, necessary for engineering practice
4) Function on multi-disciplinary teams through digital circuit experiments and projects
5) Design a digital system, components or process to meet desired needs within realistic constraints

Course Outcome (CO) - Students expected to know and be able to do at the end of each course

Site Investigation

1) Understand the importance of sub surface soil investigation and learn the various techniques of soil investigation.
2) Identify the various soil parameters required for the preparation of geotechnical report using in-situ and laboratory tests.
3) Update their skills with regard to the new technology available in the field of geotechnical engineering.
4) Sufficient exposure about the soil investigation for off-shore structure using modern instruments.

Program outcomes (PO): What the graduates of a *UG Program* should be able to do at the time of graduation.

1.	**Engineering knowledge**	**7.**	**Environment and sustainability**
2.	**Problem analysis**	8.	**Ethics**
3.	**Design/development of solutions**	9.	**Individual and team work**
4.	**Conduct investigations of complex problems**	10.	**Communication**
5.	**Modern tool usage**	11.	**Project management and finance**
6.	**The engineer and society**	12.	**Life-long learning**

Site Investigation- CO-PO Matrix

CO	PO
Understand the importance of sub surface soil investigation and learn the various techniques of soil investigation.	Engineering knowledge
	Problem analysis
	Design/development of solutions
Identify the various soil parameters required for the preparation of geotechnical report using in-situ and laboratory tests.	Conduct investigations of complex problems
	Modern tool usage
	The engineer and society
Update their skills with regard to the new technology available in the field of geotechnical engineering.	Environment and sustainability
	Ethics
	Individual and team work
Sufficient exposure about the soil investigation for off-shore structure using modern instruments.	Communication
	Project management and finance
	Life-long learning

3.1.2. CO-PO matrices of courses selected in 3.1.1 (one course per semester from 3rd to 8th semester) **(05)**
Correlation Level: High-3, Medium-2, Low-1

Subject - *Site Investigation*

CO/PO	1	2	3	4	5	6	7	8	9	10	11	12
CO-1	H-3	M	H	M	H	H	L	H	M	L	H	H
CO-2	H-3	H	H	M	H	H	L	L	M	L	H	H
CO-3	H-3	H	H	M	H	H	H	H	M	L	H	H
CO-4	M-2	L	H	L	M	M	M	M	L	L	H	H
Av	2.75	2.25	3	1.75	2.75	2.75	1.75	2.25	1.75	1	3	3

3.1.3. Program level Course-PO matrix of all courses INCLUDING *first year courses* (10)

Similar table is to be prepared for PSOs (For all courses of the Program)

CO/PO	1	2	3	4	5	6	7	8	9	10	11	12
CO101												
……												
……												

Program Specific Outcomes

Program Specific Outcomes (PSOs):

Graduates of a *specific UG Program* should be able to do at the time of graduation

- Beyond POs
- Specific to the particular program
- 2 to 4 in number
- Must have a process for arriving at them
- Must be realistic
- Program Curriculum and other activities during the program must help the achievement of PSOs as with POs!

PSO- Civil Engineering

- Graduates shall demonstrate sound knowledge in analysis, design, laboratory investigations and ***construction aspects of civil engineering infrastructure,*** along with good foundation in mathematics, basic sciences and technical communication
- Graduates will have a broad understanding of economical, environmental, societal, health and safety factors involved in ***infrastructural development,*** and shall demonstrate ability to function within multidisciplinary teams with competence in modern tool usage
- Graduates will be motivated for continuous self-learning in ***engineering practice and/or pursue research in advanced areas of civil engineering*** in order to offer engineering services to the society, ethically and responsibly

Site Investigation- CO-PSO Matrix

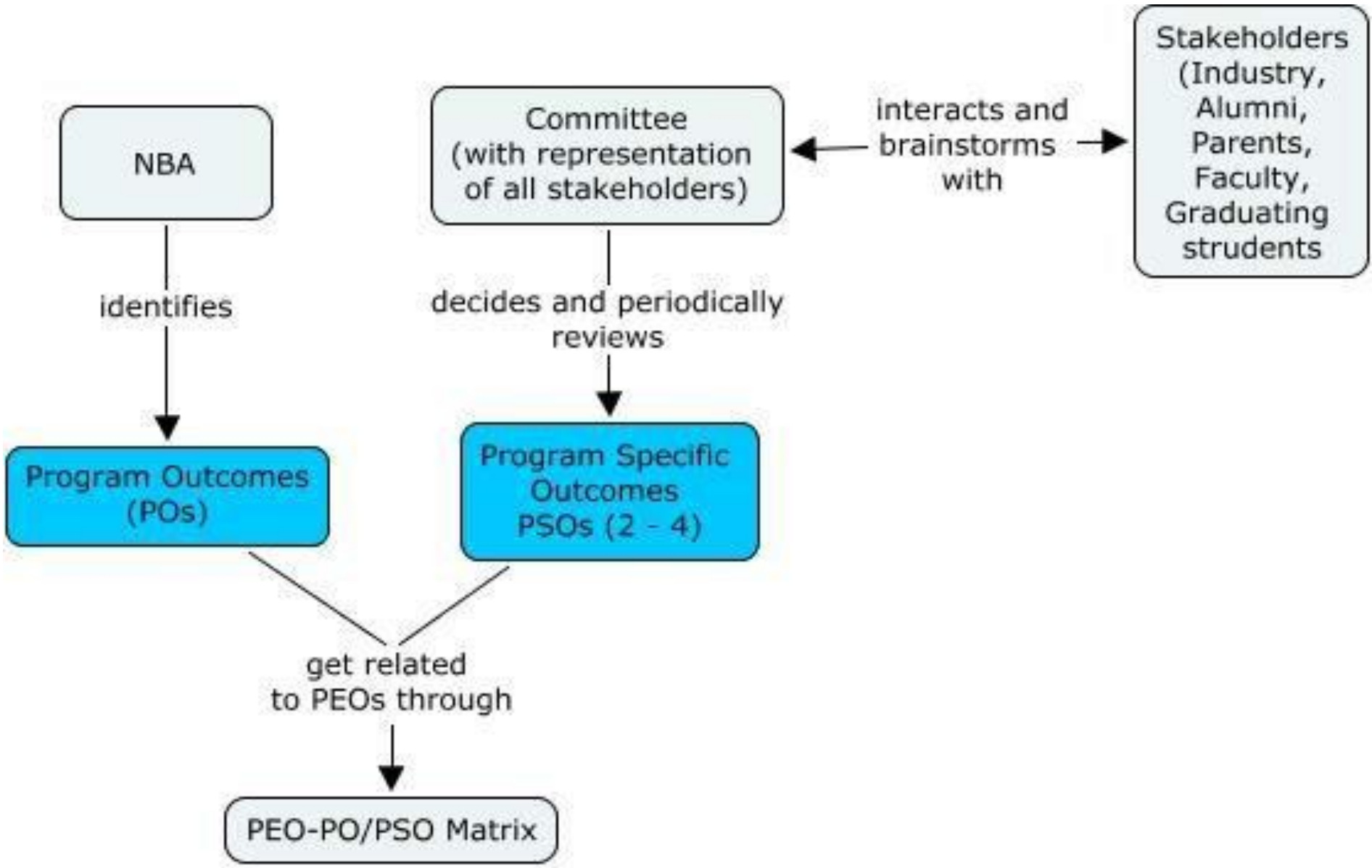
CO	PSO
Understand the importance of sub surface soil investigation and learn the various techniques of soil investigation.	Graduates shall demonstrate sound knowledge in analysis, design, laboratory investigations and ***construction aspects of civil engineering infrastructure,*** along with good foundation in mathematics, basic sciences and technical communication
Identify the various soil parameters required for the preparation of geotechnical report using in-situ and laboratory tests.	Graduates will have a broad understanding of economical, environmental, societal, health and safety factors involved in ***infrastructural development*****,** and shall demonstrate ability to function within multidisciplinary teams with competence in modern tool usage
Update their skills with regard to the new technology available in the field of geotechnical engineering.	Graduates will be motivated for continuous self-learning in ***engineering practice and/or pursue research in advanced areas of civil engineering*** in order to offer engineering services to the society, ethically and responsibly
Sufficient exposure about the soil investigation for off-shore structure using modern instruments.	

CO-PSO Matrix

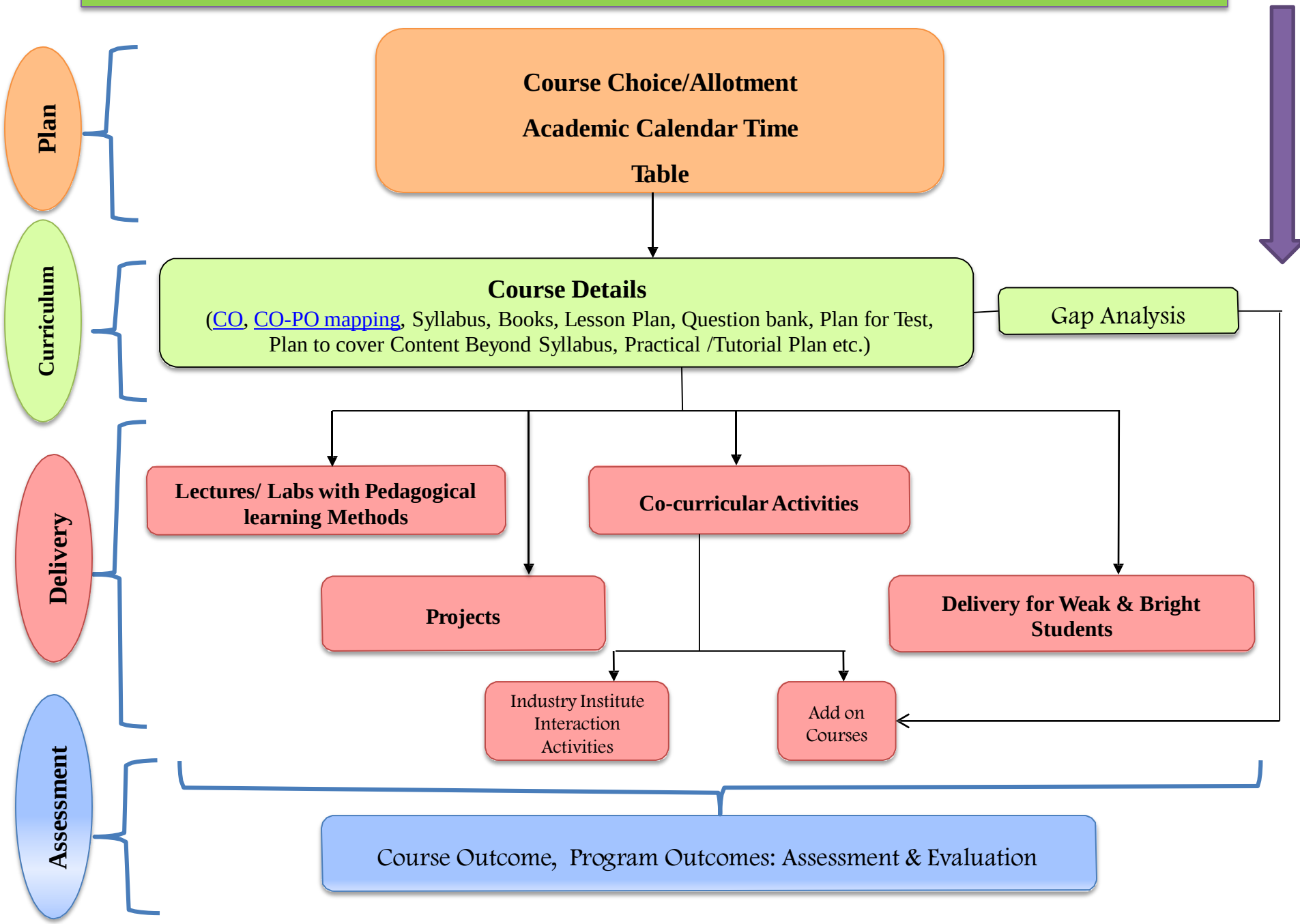
Correlation Level: High-3, Medium-2, Low-1

CO\PSO	PSO1	PSO2	PSO3
CO1	H-3	M	L
CO2	H-3	M	M
CO3	H-3	H	H
CO4	L-1	M	H
Av.	2.5	2.25	2.25

POs and PSOs


NBA
identifies
Program Outcomes (POs)
Committee (with representation of all stakeholders)
interacts and brainstorms with
Stakeholders (Industry, Alumni, Parents, Faculty, Graduating strudents
decides and periodically reviews
Program Specific Outcomes PSOs (2 - 4)
get related to PEOs through
PEO-PO/PSO Matrix

Academic Process



3.2. Attainment of Course Outcomes (50)

- ✓ 3.2.1. Describe the assessment processes used to gather the data upon which the evaluation of Course Outcome is based **(10)**
  - ➢ *List of Assessment process (2)*
  - ➢ *Quality and relevance of processes and tools (8)*

- ✓ 3.2.2. Record the attainment of Course Outcomes of all courses with respect to set attainment levels **(40)**

Assessment processes to gather data and the evaluation of Course Outcome

- CO assessment tool (To measure attainment level)
- Direct assessment tool

✓ Mid Semester Examination (MSE) – Minimum two
(MSE-I: CO1,CO2 MSE-II: CO3,CO4,CO5,CO6)

✓ Assignment/ Quiz

✓ End Semester Examination

✓ Performance during laboratory experiments

- Indirect assessment tool

✓ Exit survey

CO –Assessment Matrix:

MSE: Mid Semester Examination, ESE: End Semester Examination

CES: Course Exit Survey

DA: Direct Assessment, IA: Indirect Assessment

Course outcome	DA									IA	Total
	MSE		Assignment						ESE	CES	
	I	II	1	2	3	4	5	6			
CO1	10		10						70	2	92
CO2	10			10						2	92
CO3		4			10					2	86
CO4		4				10				2	86
CO5		6					10			2	88
CO6		6						10		2	88
Total	20	20	10	10	10	10	10	10	70	12	

Measuring Course Outcome- ESE (University Examination)

- ***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*
- ***Assumes that marks represent all the course outcome defined for the course***
- ***Attainment is measured in terms of actual percentage of students getting set percentage of marks***

Measuring Course Outcome-Internal Assessment

- ***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

Sample Calculation: Mid Semester Records of Marks

1: S.N., 2: Enrolment No., 3: Name of Student

Note:

100% students achieved marks greater than 60%, thus the Attainment Level: 3

1	2	3	Mid Semester Attainment (Marks)						Total marks	%age marks
			10	10	4	4	6	6		
			CO1	CO2	CO3	CO4	CO5	CO6		
1	EC131001	N1	10	10	3	3	5	4	35	87.5
2	EC131002	N2	9	9	3	3	6	6	36	90.0
3	EC131003	N3	8	9	3	3	6	5	34	85
…	….	….	…	….	….	….	…	…	…	…
131	EC131131	N131	10	7	4	3	6	3	33	82.5
Total			1002	819	414	412	633	681		
Average			7.6	6.3	3.2	3.2	4.8	5.2	30.3	75.75

Sample Calculation: Assignment Records of Marks

1: S.N., 2: Enrolment No., 3: Name of Student

Note:

82% students achieved marks greater than 60%, thus the Attainment Level: 3

1	2	3	Mid Semester Attainment (Marks)						%age marks
			10	10	10	10	10	10	
			CO1	CO2	CO3	CO4	CO5	CO6	
1	EC131001	N1	6	8	10	10	6	8	80
2	EC131002	N2	8	10	5	8	10	8	82
3	EC131003	N3	6	8	4	6	6	4	57
…	….	….	…	….	….	….	…	…	…
131	EC131131	N131	7	5	8	9	4	5	63
Total			854	892	818	675	734	775	81.51
Average			6.52	6.81	6.25	5.16	5.6	5.92	

Sample Calculation: Course Exit Survey- Marks

1: S.N., 2: Enrolment No., 3: Name of Student

Note:

92% students achieved marks greater than 60%, thus the Attainment Level: 3

1	2	3	Course Exit Survey Attainment (Marks)						%age marks
			2	2	2	2	2	2	
			CO1	CO2	CO3	CO4	CO5	CO6	
1	EC131001	N1	2	2	2	2	2	2	100
2	EC131002	N2	2	2	2	2	2	2	100
3	EC131003	N3	1	2	2	1	2	2	83
…	….	….	…	….	….	….	…	…	…
131	EC131131	N131	2	1	2	1.5	1.5	1	75
Total			233.0	239.5	228.0	236.0	246.5	238.0	1421
Average			1.78	1.83	1.74	1.80	1.88	1.82	11

Sample Calculation: End Semester Marks

1: S.N., 2: Enrolment No., 3: Name of Student

Note:

82% students achieved marks greater than Average marks, thus the Attainment Level: 3

		Attainment	ESE Grades	Marks	Marks
1	2	3	Total	Out of 100	Out of 70
1	EC131001	N1	A	85	59.5
2	EC131002	N2	A	85	59.5
3	EC131003	N3	B+	75	52.5
…	….	….	….	…	….
131	EC131131	N131	C	45	31.5
	Total			10203	7208
	Average	70		78.58	55

Course Outcome Attainment: DA

- *If Attainment through*

✓ *University Examination: Substantial (H) i.e. 3*

✓ *Internal Assessment: Moderate (M) i.e. 2*

- Attainment = 80% weightage to Univ. Exam. + 20% weightage to Internal assessment

➢ 80% of 3 + 20% of 2 = 2.4 + 0.4 = 2.8

- If Weightage is 50%- 50%

➢ 50% of 3 + 50% of 2 = 1.5+1 = 2.5

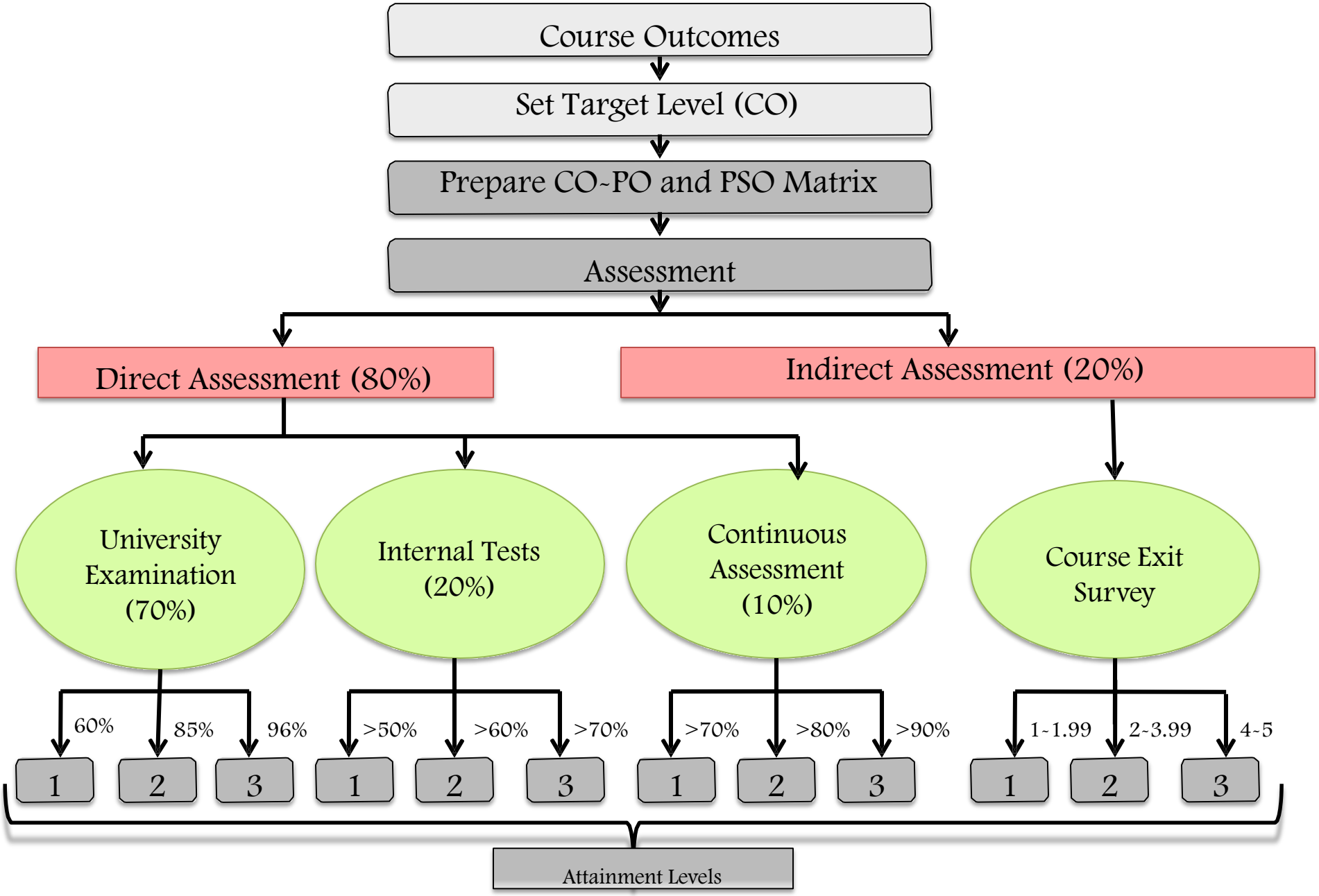
➢ Attainment= 80% of DA + 20% of IA

CO Attainment Table

Total Attainment = 0.8xDA+0.2xIA

CO	DA								IA	TA	Target (%)
	MSE		Assignment						ESE	CES			
	I	II	1	2	3	4	5	6					
CO1	7.6		6.52						55	1.78	55.6	***55***
CO2	6.3			6.81					55	1.83	54.8	***55***
CO3		3.2			6.25				55	1.74	51.8	***52***
CO4		3.2				5.16			55	1.80	51.0	***52***
CO5		4.8					5.60		55	1.88	52.6	***53***
CO6		5.2						5.92	55	1.82	53.2	***53***

Course Outcome Assessment Process & Tools



Sample CO Attainment

Course Name: Linear Integrated Circuits **Academic Year :** 2015-16 **Semester:** IV

CO	Assessment Tools	Internal Test (20%)		University Result (70%)		Continuous Assessment Sheet (10%)		Direct Assessment (DA)	Indirect Assessment (IDA)		CO Attainment (80% DA +20% IDA)	Target	Attained /Not attained
		Average	Attainment	% Result	Attainment	% Avg Marks	Attainment		Course exit survey	Attainment			
ETC208.1	Class Test, University Result, CAS, Assignments, Tutorials, Rubrics, Course Exit Survey	69.6	2	95.90	2	87.53	2	2.00	4	3	2.20	2.00	Attained
ETC208.2		54.9	1	95.90	2	87.53	2	1.80	4	3	2.04	2.00	Attained
ETC208.3		50.0	1	95.90	2	87.53	2	1.80	3	2	1.84	2.00	Attained
ETC208.4		66.4	2	95.90	2	87.53	2	2.00	5	3	2.20	2.00	Attained
ETC208.5		68.3	2	95.90	2	87.53	2	2.00	4	3	2.20	2.00	Attained
ETC208.6		67.3	2	95.90	2	87.53	2	2.00	4	3	2.20	2.00	Attained
ETC208.7		68.3	2	95.90	2	87.53	2	2.00	3	2	2.00	2.00	Attained

CO Attainment of all courses

	Attainment Status	Justification
1.	Attained	Assessment of CO is **more** than 85% of set attainment level
2.	Not Attained	Assessment of CO is **less** than 85% of set attainment level

Note: Depending upon attainment status of the COs, either CO target level or CO assessment level will be changed for subsequent year ,

3.3.Attainment of Program Outcome and Program Specific Outcome (50)

- **3.3.1. Describe assessment tools and processes used for measuring the attainment of each of the Program Outcomes (PO) and Program Specific Outcomes (PSO) – 10**

➢ ***List of Assessment tools and processes (5)***

➢ ***Quality/Relevance of assessment tools and processes (5)***

- **3.3.2. Provide results of evaluation of each PO & PSO (40)**

➢ ***Results and level of attainment of each PO/PSO (24)***

➢ ***Overall levels of attainment (16)***

Setting CO Attainment Targets & PO/PSO attainment

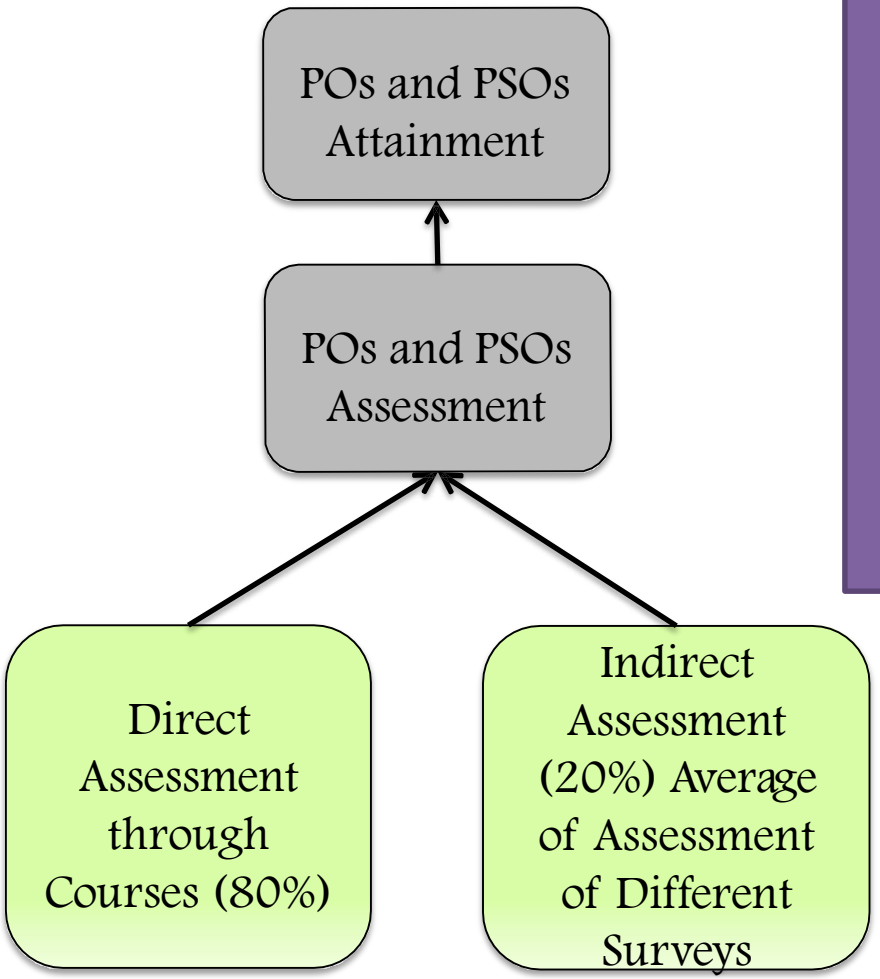
- *Every CO of the course will not address every PO and PSO of the Program- Very Important*

- ***Attainment of PO1=(1/3)*Av.(0.623+0.669) = 0.215***
- ***Attainment of PO2=(1/3)*Av.(0.678) = 0.226***
- ***Attainment of PO3=(1/3)*Av.(0.671+0.614+0.662)= 0.648***

CO	Pos/PSOs	CO Attainment %
CO1	PO1, PO10, PSO1	62.3
CO2	PO2, PO10,PSO1	67.8
CO3	PO1, PSO1	66.9
CO4	PO3, PO4,PO5, PSO1	67.1
CO5	PO3, PO4,PO5, PSO1	61.4
CO6	PO3, PO4,PO5, PSO1	66.2

PO/PSO Assessment Process and Tools

- Process



- Tools

Tools

- Dire Assessment through Courses
  - University examination
  - Internal examination
  - Tutorials
  - Module tests /class Tests
  - **Direct Assessment Rubrics**
    - Continuous Assessment at laboratory
  - Indirect Assessment
    - Course exit survey
- Indirect Assessment through Different Surveys
  - Program Exit Survey
  - Alumni Survey
  - Employer Survey
  - External Examiner Feedback
  - Industrial Visit Evaluation Rubrics
  - In Plant Training Evaluation Rubrics
  - Guest Lecture/Workshop/Expert Lecture resource person feedback
  - Parent Feedback
  - Guest Lecture/Workshop/Expert Lecture students feedback
  - Co-curricular & Extra Curricular Activities

PO and PSO Attainment

PO attainment = (PO mapped level/3)* CO attainment

Course Name: Linear Integrated Circuits **Academic Year:** 2015-2016 **Semester:** IV

CO	CO Attainment	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
ETC208.1	2.20	0.73	-	-	0.73	-	-	-	0.00	-	-	-	-	0.73	-
ETC208.2	2.04	1.36	1.36	-	1.36	1.36	-	-	1.36	-	1.36	-	-	1.36	-
ETC208.3	1.84	0.61	-	-	-	-	-	-	-	-	-	-	-	0.61	-
ETC208.4	2.20	0.73	0.73	-	-	-	-	-	-	-	-	-	-	0.73	-
ETC208.5	2.20	1.47	0.73	-	-	-	-	-	-	-	-	-	-	1.47	-
ETC208.6	2.20	1.47	-	-	-	-	-	-	-	-	-	-	-	1.47	-
ETC208.7	2.00	1.33	1.33	-	1.33	0.67	-	-	0.67	1.33	-	-	-	1.33	-
Attainment	-	1.10	1.04	-	1.14	1.01	-	-	1.01	1.33	1.36	-	-	1.10	-

PO and PSO Attainment (Indirect Assessment)

Year of Study: 2015-16

Surveys	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
Program Exit Survey	2.78	2.66	2.61	2.66	2.64	2.61	2.64	2.73	2.62	2.64	2.63	2.66	2.64	2.66
Alumni Feedback	2	2	-	-	3	-	3	3	3	2	3	3	-	-
Parent Feedback	2.11	-	-	-	2.25	2.15	2.15	2.13	-	2.11	-	2.25	-	-
Guest Lecture / Expert Lecture/ workshop Resource person Feedback	2	-	-	2	2	-	1	2	-	1	-	2	-	-
Guest Lecture / Expert Lecture/ Workshop Student Feedback	2	-	-	3	2	-	3	-	-	-	-	3	-	-
External Examiner Feedback	2	-	-	2	-	-	-	1	-	2	-	-	-	-
In-plant training u industry person	3	-	-	-	-	-	-	3	3	1	-	2	-	-
Industrial Visit by industry person		-	-	-	-	-	-	3	-	3	-	3	-	-
Employer Feedback	3	2	-	-	2	-	3	3	3	3	3	2	-	-
Co-curricular activities	-	-	-	-	3	3	3	3	3	3	3	3	-	-
Extra-curricular activities	-	-	-	-	-	2.17	2	2.17	2.2	2	-	2	-	-
Recruiters	2	-	-	-	-	2	1	2		1	-	2	-	-
Attainment	2.32	2.22	2.61	2.41	2.41	2.39	2.31	2.46	2.80	2.07	2.91	2.45	2.64	2.66

Formulae for PO& PSO Attainment (2015-2016)

Sample

PO1

- **Engineering Knowledge:** Apply **knowledge** of mathematics, science and engineering appropriate to Electronics and Telecommunication Engineering.

80% of Direct assessment

+

20%[average(Program Exit Survey, Alumni Survey, Employer Survey, External Examiner Feedback, In Plant Training, Guest Lecture/Workshop/Expert Lecture resource, person feedback, Parent Feedback, Guest Lecture/Workshop/Expert Lecture student feedback)]

→ **Attainment**

PSO1

- Design Analog, Digital and Embedded Systems using state of the art technology.

80% of Direct assessment

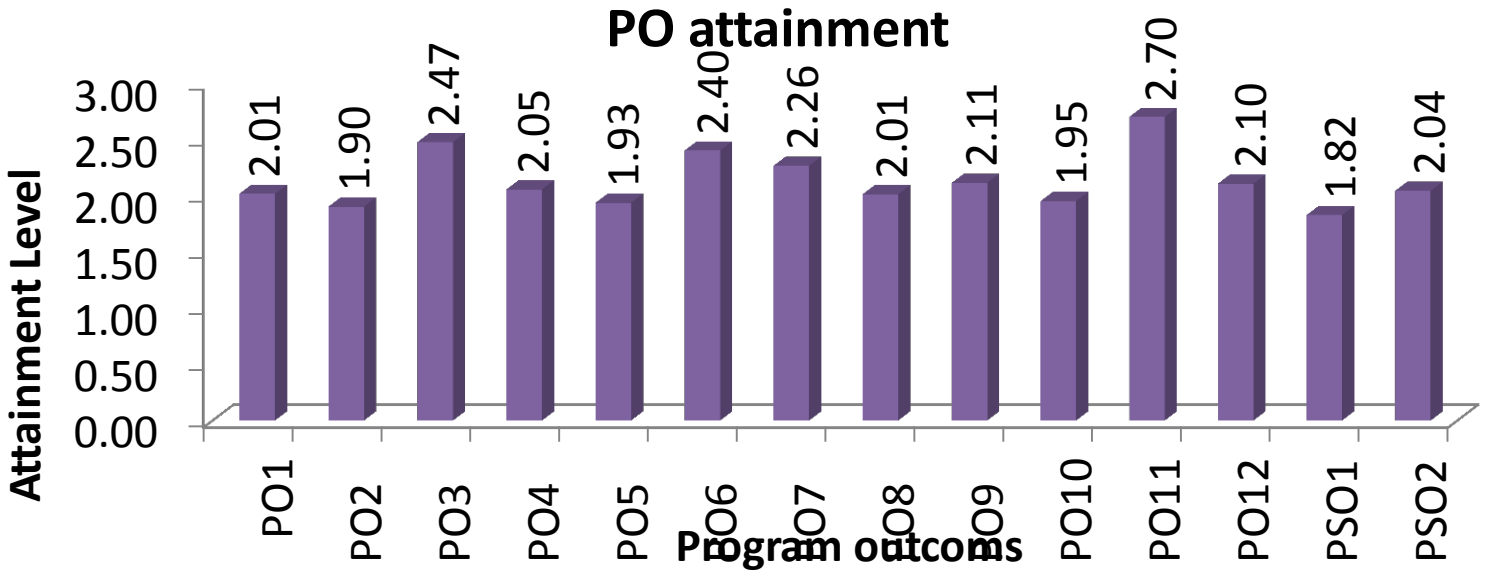
+

20% of Program Exit Survey

→ **Attainment**

PO/PSO Attainment (2015-2016)

Program Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1	PO11	PO12	PSO1	PSO2
Direct Assessment	1.93	1.79	2.34	1.94	1.80	2.38	2.24	1.89	1.92	1.91	2.62	2.01	1.53	1.80
Indirect Assessment	2.32	2.22	2.61	2.41	2.41	2.39	2.31	2.46	2.80	2.07	2.91	2.45	2.64	2.66
Actual Attainment	2.01	1.90	2.47	2.05	1.93	2.40	2.26	2.01	2.11	1.95	2.70	2.10	1.82	2.04
Rounded to	2	2	2	2	2	2	2	2	2	2	3	2	2	2
Target	2	2	3	2	2	2	2	2	2	2	3	2	2	2
Attained / Not Attained	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y



2015-2016
2014-2015
2013-2014
Comparison of three Years

Attainment of PO

Sem	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12
CO-1												
CO-2												
CO-3												
CO-4												
CO-5												
CO-6												
CO-7												
CO-8												
Av.												
Target												
A/ NA												

Attainment of PSO

PSO	CO1	CO2	CO3	CO4	CO5	CO6	CO7	CO8	Av	Target	Attained /NA
PSO1											
PSO2											
PSO3											
PSO4											

Any question/ query…….?

Acknowledgement

All the known or unknown sources used during making the presentation are duly acknowledged, without the use of their data/information, the presentation would not have been so informative.

Thank you for listening!