CRITERION 7   Continuous Improvement

7.1 Actions taken based on the results of evaluation of each of the COs, POs & PSOs (30)

Identify the areas of weaknesses in the program based on the analysis of evaluation of COs, POs & PSOs attainment levels. Measures identified and implemented to improve POs& PSOs attainment levels for the assessment year including curriculum intervention, pedagogical initiatives, support system improvements, etc. Actions to be written as per table in 3.3.2

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 up-gradation)

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.

Table 7.1: Comparison of POs & PSOs

POs	(2017-2021)		(2018-2022)		(2019-2023)	
	Target Level (70%)	Attainment Level	Target Level (70%)	Attainment Level	Target Level (70%)	Attainment Level
PO 1	>2	2.11	>2	2.26	>2	2.46
PO 2	>1.8	1.99	>1.6	2.08	>1.6	2.33
PO 3	>1.6	1.51	>1.3	1.69	>1.3	2.31
PO 4	>1.3	1.32	>1.2	1.32	>1.2	2.08
PO 5	>1.6	1.51	>1.4	1.82	>1.4	2.28
PO 6	>1.0	1.06	>1	1.25	>1	2.07
PO 7	>1.0	1.03	>0.8	1.22	>0.8	2.06
PO 8	>1.0	0.93	>0.8	0.88	>0.8	1.89
PO 9	>1.4	1.46	>1.3	1.72	>1.3	2.34
PO 10	>1.4	1.36	>1.2	1.50	>1.2	2.24
PO 11	>1.1	1.14	>0.9	1.1	>0.9	2.01
PO 12	>1.2	1.22	>0.9	0.98	>0.9	2.02
PSO 1	>1.6	1.40	>1.4	1.70	>1.4	2.16
PSO 2	>1.5	1.44	>1.3	1.48	>1.3	2.09
PSO 3	>1.7	1.64	>1.4	1.75	>1.4	2.21

POs and PSOs Attainment Levels and Actions for Improvement- (2019-23 Batch)

POs	Target Level	Attainment Level	Observations	Actions Taken
PO 1	>2	2.46	Achieved	The attainment is greater than the set target level. The target level shall be set higher for the next curriculum revision.
PO 2	>1.6	2.33	Achieved	The attainment is greater than the set target level. The target level shall be set higher for the next curriculum revision.
PO 3	>1.3	2.31	Achieved	The attainment is greater than the set target level. The target level shall be set higher for the next curriculum revision.
PO 4	>1.2	2.08	Achieved	The attainment is greater than the set target level. The target level shall be set higher for the next curriculum revision.
PO 5	>1.4	2.28	Achieved	The attainment is greater than the set target level. The target level shall be set higher for the next curriculum revision.
PO 6	>1	2.07	Achieved	The attainment is greater than the set target level. The target level shall be set higher for the next curriculum revision.
PO 7	>0.8	2.06	Achieved	The attainment is greater than the set target level. The target level shall be set higher for the next curriculum revision.
PO 8	>0.8	1.89	Achieved	The attainment is greater than the set target level. The target level shall be set higher for the next curriculum revision.
PO 9	>1.3	2.34	Achieved	The attainment is greater than the set target level. The target level shall be set higher for the next curriculum revision.

POs	Target Level	Attainment Level	Observations	Actions Taken
PO 10	>1.2	2.24	Achieved	The attainment is greater than the set target level. The target level shall be set higher for the next curriculum revision.
PO 11	>0.9	2.01	Achieved	The attainment is greater than the set target level. The target level shall be set higher for the next curriculum revision.
PO 12	>0.9	2.02	Achieved	The attainment is greater than the set target level. The target level shall be set higher for the next curriculum revision.
PSO 1	>1.4	2.16	Achieved	The attainment is greater than the set target level. The target level shall be set higher for the next curriculum revision.
PSO 2	>1.3	2.09	Achieved	The attainment is greater than the set target level. The target level shall be set higher for the next curriculum revision.
PSO 3	>1.4	2.21	Achieved	The attainment is greater than the set target level. The target level shall be set higher for the next curriculum revision.

POs and PSOs Attainment Levels and Actions for Improvement- (2018-22 Batch)

POs	Target Level	Attainment Level	Observations	Actions Taken
PO 1	>2	2.26	Achieved	The attainment is greater than the set target level. The target level shall be set higher for the next curriculum revision.
PO 2	>1.6	2.08	Achieved	The attainment is greater than the set target level. The target level shall be set higher for the next curriculum revision.

POs	Target Level	Attainment Level	Observations	Actions Taken
PO 3	>1.3	1.69	Achieved	The attainment is greater than the set target level. The target level shall be set higher for the next curriculum revision.
PO 4	>1.2	1.32	Achieved	The attainment is greater than the set target level. The target level shall be set higher for the next curriculum revision.
PO 5	>1.4	1.82	Achieved	The attainment is greater than the set target level. The target level shall be set higher for the next curriculum revision.
PO 6	>1	1.25	Achieved	The attainment is greater than the set target level. The target level shall be set higher for the next curriculum revision.
PO 7	>0.8	1.22	Achieved	The attainment is greater than the set target level. The target level shall be set higher for the next curriculum revision.
PO 8	>0.8	0.88	Achieved	The attainment is greater than the set target level. The target level shall be set higher for the next curriculum revision.
PO 9	>1.3	1.72	Achieved	The attainment is greater than the set target level. The target level shall be set higher for the next curriculum revision.
PO 10	>1.2	1.50	Achieved	The attainment is greater than the set target level. The target level shall be set higher for the next curriculum revision.
PO 11	>0.9	1.1	Achieved	The attainment is greater than the set target level. The target level shall be set higher for the next curriculum revision.

POs	Target Level	Attainment Level	Observations	Actions Taken
PO 12	>0.9	0.98	Achieved	The attainment is greater than the set target level. The target level shall be set higher for the next curriculum revision.
PSO 1	>1.4	1.70	Achieved	The attainment is greater than the set target level. The target level shall be set higher for the next curriculum revision.
PSO 2	>1.3	1.48	Achieved	The attainment is greater than the set target level. The target level shall be set higher for the next curriculum revision.
PSO 3	>1.4	1.75	Achieved	The attainment is greater than the set target level. The target level shall be set higher for the next curriculum revision.

POs and PSOs Attainment Levels and Actions for Improvement- (2017-21 Batch)

POs	Target Level	Attainment Level	Observations	Actions Taken
PO 1	>2	2.11	Achieved	Fundamental core subjects will be taught in earlier semesters for further improvement in the attainment level.
PO 2	>1.8	1.99	Achieved	By introducing simulation assisted problem solving in relevant subjects attainment level can be further improved.
PO 3	>1.6	1.51	Not Achieved	By introducing design studies and analysis in relevant subjects it can be attained.
PO 4	>1.3	1.32	Achieved	Introduced self-directed learning component in the next curriculum revision for further improvement.

POs	Target Level	Attainment Level	Observations	Actions Taken
PO 5	>1.6	1.51	Not Achieved	By introducing simulation-assisted teaching and inclusion in the assessment.
PO 6	>1.0	1.06	Achieved	Assignment on safety will be included in the laboratory courses.
PO 7	>1.0	1.03	Achieved	Impact of the engineering solutions in societal and environmental contexts will be addressed in group assignments
PO 8	>1.0	0.93	Not Achieved	Two courses on creativity and human values are added in the first year. SDL module on ethics will be introduced.
PO 9	>1.4	1.46	Achieved	Mini Project and Group Assignments will be introduced
PO 10	>1.4	1.36	Not Achieved	Group Assignments and presentations on the same will be introduced.
PO 11	>1.1	1.14	Achieved	Peer to peer assessment will be incorporated for assessment of project management skills.
PO 12	>1.2	1.22	Achieved	Self-study topics and their assessment in each subject is introduced in the next curriculum revision.
PSO 1	>1.6	1.40	Not Achieved	Simulation studies in the areas of power system, control system, etc are introduced in the next curriculum revision.
PSO 2	>1.5	1.44	Not Achieved	System simulation using simulation tools.
PSO 3	>1.7	1.64	Not Achieved	Mini Project is introduced in the relevant course.

Overall Direct PO Attainment: 2018-22 Batch

Semester 7	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
Semester 7[July -Dec 2021]/Program Electives/Minor Specialization																
ELE 4062	2.95	2.95	2.95		2.95							2.95		2.95		
ELE 4064	2.48	2.45												2.40		
ELE 4077	2.70	2.67	2.67													
ELE 4078	2.47	2.47	2.47		2.47							2.47		1.75		
ELE 4083	2.00	2.08	2.04	1.94				1.94				1.94	1.94	2.47	2.08	
ELE 4084	2.88	2.91	2.82			2.98	2.84			2.98		2.88	2.92	2.82		
ELE 4085	2.59	2.59	2.56	2.54	2.54							2.54	2.54	2.54	2.54	
ELE 4086	2.56	2.63	2.92	2.92			2.92	2.92	2.92		1.48	2.63	2.63		2.92	
ELE 4088	2.71	2.82	2.79		2.91	2.91	2.91					2.71	2.79	2.76	2.91	
Average Attainment																
Semester 8	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
Semester 8(Jan-May 2022)																
PROJECT	2.88	2.88	2.88	2.88	2.88	1.92	1.92	2.88	2.88	2.88	1.92	2.88	1.92	1.92	1.92	
Overall Program attainment																
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
Program attainment	2.26	2.08	1.69	1.32	1.82	1.25	1.22	0.88	1.72	1.50	1.10	0.98	1.70	1.48	1.75	

Overall Direct PO Attainment: 2019-23 Batch

PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12		PSO1	PSO2	PSO3	PSO4
PO Attainment Average Target Set for the Program	**2.0**	**1.6**	**1.3**	**1.2**	**1.4**	**1.0**	**0.9**	**0.8**	**1.3**	**1.2**	**0.9**	**0.9**		**1.4**	**1.3**	**1.4**	
Direct PO Attainment for the Semesters																	
	Average Attainment	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12		PSO1	PSO2	PSO3	PSO4
Direct PO Attainment	Semester 3 & 4	2.69	2.24	2.20	1.33	1.86	1.25	1.20	0.94	1.81	1.24	1.00	1.05		1.75	1.37	2.30	
	Semester 5	2.34	2.31	2.28	2.05	2.36	2.42	2.49	2.37	2.47	2.41	2.39	2.35		2.20	2.36	2.31	
	Semester 6	2.03	2.03	2.04	2.25	2.18	1.94	1.89	1.61	2.34	2.62	2.00	2.02		1.99	1.95	1.53	
	Semester 7	2.35	2.20	2.17	1.88	2.13	1.87	1.86	1.64	2.21	2.09	1.80	1.81		1.98	1.90	2.05	
	Semester 8	2.87	2.87	2.87	2.87	2.87	2.87	2.87	2.87	2.87	2.87	2.87	2.87		2.87	2.87	2.87	
	Direct Average PO Attainment	**2.46**	**2.33**	**2.31**	**2.08**	**2.28**	**2.07**	**2.06**	**1.89**	**2.34**	**2.24**	**2.01**	**2.02**		**2.16**	**2.09**	**2.21**	
	Attainment Status	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	