



E.G.S. PILLAY ENGINEERING COLLEGE (AUTONOMOUS)

NAGAPATTINAM – 611 002. TAMILNADU, INDIA

Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai
(Accredited by NAAC with 'A' Grade and NBA)

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2.6.2. Attainment of Course Outcomes and Program Outcomes

Attainment of Program Outcomes

Establish the correlation between the courses and the Program Outcomes (POs) & Program Specific Outcomes.

The curriculum of the program is designed with core and elective courses by considering Vision, Mission, Program Educational Objectives (PEOs), Program Outcomes (POs), Program Specific Outcomes (PSOs), Model curriculum of AICTE, requirements of the stake holders, suggestions from industries.

Course Outcomes (CO) are statements that are framed in the view of what the students are expected to attain at the end of the course. Each course has 5-6 course outcomes depending on its significance which are mapped to the Program Outcomes and Program Specific Outcomes

Formulation of Program Articulation Matrix

Program Articulation Matrix is formed by the strength of correlation of COs with POs and PSOs. The strength of correlation of COs with POs and PSOs is indicated as "3" for substantial (high) correlation, "2" for moderate (medium) correlation and "1" for slight (low) correlation. If the course outcomes are attained, the POs correlated to these course outcomes are also attained.

Formulation of Course Articulation Matrix

Course articulation matrix correlates the individual Course Outcomes of a course with Program Outcomes and Program Specific Outcome. The strength of correlation of individual COs of a course with POs and PSOs is indicated as "3" for substantial (high) correlation, "2" for moderate (medium) correlation and "1" for slight (low) correlation.

Describe assessment tools and processes used for measuring the attainment of each Program Outcome and Program Specific Outcomes

Po Assessment Tools

Assessment tools for Program outcomes and Program Specific outcomes are categorized into two namely Direct and Indirect assessment methods.




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Direct Assessment Tools:

Direct assessment tools display the knowledge and skills of students based on their performance. They include tests, assignments, tutorials and examinations etc. which are based on the questions that relate to specific course outcomes in each course. As COs are mapped to the POs and PSOs, the direct assessment tools used for COs can also be used for POs and PSOs.

Indirect Assessment Tools:

Attainment of Program Outcome and Program Specific Outcome is also measured through Indirect Assessment tools. One such tool is the opinion of graduates during the completion of the program. A survey is taken near the end of the semester for each course. Besides, a survey on the attainment of each Program Outcome is also taken from stakeholders. They all contribute equally towards indirect assessment of attainment of POs.

S. NO	PO Attainment	ASSESSMENT TOOLS
1	Direct PO Attainment	CATs, Tutorials, Assignments, Quiz, Mini Project, Seminar and Technical Presentation, etc
2	Indirect PO Attainment	<ul style="list-style-type: none">✓ Course Exit Survey✓ Faculty Survey✓ Student exit survey✓ Co-Curricular Exit Survey✓ Extra-Curricular Exit Survey

The details of Indirect Assessment tools for PO assessment.

TYPE OF ASSESSMENT	COURSE ASSESSMENT AND EVALUATION METHOD	PROCESS
Indirect assessment tools	Course Exit Survey	On completion of every semester, a feedback is obtained from the students for the courses which they have learnt.
	Faculty Survey	On completion of every semester, a feedback is collected from the Faculty members, for the courses they have taught and the same is considered when redesigning POs, PSOs and curriculum.
	Student exit survey	Feedback questionnaire relevant to POs is asked in the Graduate exit survey form at the end of the program.




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	Co-Curricular Exit Survey	Feedback questionnaire relevant to co- curricular activities at the end of the program.
	Extra-Curricular Exit Survey	Feedback questionnaire relevant to extra-curricular activities at the end of the program.

Provides details of frequency of data collection for assessment of POs and PSOs.

TYPE OF ASSESSMENT TOOL	ASSESSMENT TOOL	ASSESSMENT CRITERIA	DATA COLLECTION FREQUENCY
Direct Assessment	Continuous Assessment Test	Number of students passed	Monthly
	Assignments, Tutorials, Seminar, Technical Quiz, Technical presentation and Projects	Type and components assigned to the particular subject	Every semester
	Semester End Examination	Number of students passed	Every semester
Indirect Assessment	Course Exit Survey	Questions asked in the survey form relevant to COs	At the end of the completion of course
	Faculty Survey	Performance of the students	Every semester
	Student exit survey	Questions asked in the survey form relevant to POs and PSOs	At the end of the completion of degree /program
	Co-Curricular Exit Survey	Number of students attended Paper Presentation, Workshops, Internship/In-plant Training and Project	At the end of the completion of degree /program



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	Extra-Curricular Exit Survey	Number of students attended Sports, NSS, CSR activities, Fine arts activities ,etc.	At the end of the completion of degree /program
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Provide results of evaluation of each PO and PSO

The evaluation POs and PSOs is carried out in terms of both direct and indirect assessment methods. Direct method of assessment is based on performance of students in the contributing courses for the corresponding POs and PSOs. Indirect method of assessment is based on the survey from various stakeholders.

PO attainment table for Direct Assessment tools:

- The evaluation of attainment of POs and PSOs is obtained through the attainment of COs for all the courses. The percentage attainment of COs for each course is multiplied by the weight of correlation of COs with POs and
- PSOs as specified in the course articulation matrix normalized to 1, to obtain the percentage attainment of POs and PSOs.
- The attainment of POs and PSOs through Direct Assessment methods.

Attainment of Course Outcomes

Describe the assessment tools and processes used to gather the data upon which the evaluation of Course Outcome is based

In Outcome Based Education (OBE), Course outcome attainment is evaluated by direct assessment tools and indirect assessment tools.

CO Assessment Processes

- The direct method of assessment includes Continuous Assessment Tests (CAT), Tutorials, Assignments, Quiz, Mini Project, Seminar and Technical Presentation, etc.
- The indirect assessment includes the feedback obtained from various stakeholders like Students, Faculty, etc.




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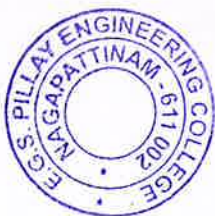
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TYPE OF ASSESSMENT	COURSE ASSESSMENT AND EVALUATION METHOD	PROCESS
Direct Assessment tools	CAT 1 AND CAT 2 (Continuous Assessment Test)	Besides the End semester examination, CAT examinations are conducted to achieve the identified COs. Two Continuous Assessment Tests are planned and conducted at regular intervals (monthly) in a semester. Questions in the question paper are mapped to COs. Blooms taxonomy level also mentioned. Corrected scripts are distributed to students and results are declared within three days after the completion of the test.
	End Semester Examination	At end of each semester, end semester examination is conducted for all courses. The questions for this examination covers entire syllabus of the courses. The questions are mapped with the COs.
	Assignments	Assignment Question banks are prepared for each topic in the course, based on the course objectives. Assignment problems are chosen from such question banks. Model solutions for assignment problems are prepared by the Faculty members concerned. Assignment works submitted by students are assessed towards attainment of COs
	Technical Quiz	Quiz questions are prepared for each topic in the course. Quiz is conducted periodically to test the knowledge and reasoning power of students. Correct answers to the quiz are discussed in the class after the completion of quiz. Quiz marks are recorded for assessing the attainment of COs.




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	Tutorials	For analytical subjects, tutorials are conducted. Based on the performance of students during tutorials marks are recorded for assessing the attainment of COs.
	Seminar and Technical Presentation	The idea behind seminar is to familiarize students more extensively with their course and also to allow them to interact with examples of the practical problems that occur in recent scenario. It is essentially a place where discussions happen, questions are raised and debates take place. It also improves students communication skills.
	Mini Projects	It provides an opportunity to students to demonstrate independence and originality, to plan and organize a project over a given period, and to put into practice, the techniques that have been taught.
	Laboratory courses	Performance of evaluation of students for laboratory courses is based on an explicit set of criteria that provides more details than a single grade or mark. These criteria which are otherwise called the rubrics act as a grading tool for laboratory work of students.
Indirect assessment tools	Course Exit Survey	On completion of every semester, a feedback is obtained from the students for the courses which they have learnt.

Weightage for assessment of Theory and Laboratory courses are as shown in Table

SUBJECT TYPE	ASSESSMENT COMPONENTS	FREQUENCY	WEIGHTAGE
Theory	Course Work (Assignments, Tutorials, Seminar, Technical Quiz, Technical presentation and Projects)	Monthly	10%
	Continuous Assessment Tests		30%
	End semester Examination	Semester	60%
Laboratory/Project	Continuous assessment	Periodical	50%
	End semester Examination	Semester	50%



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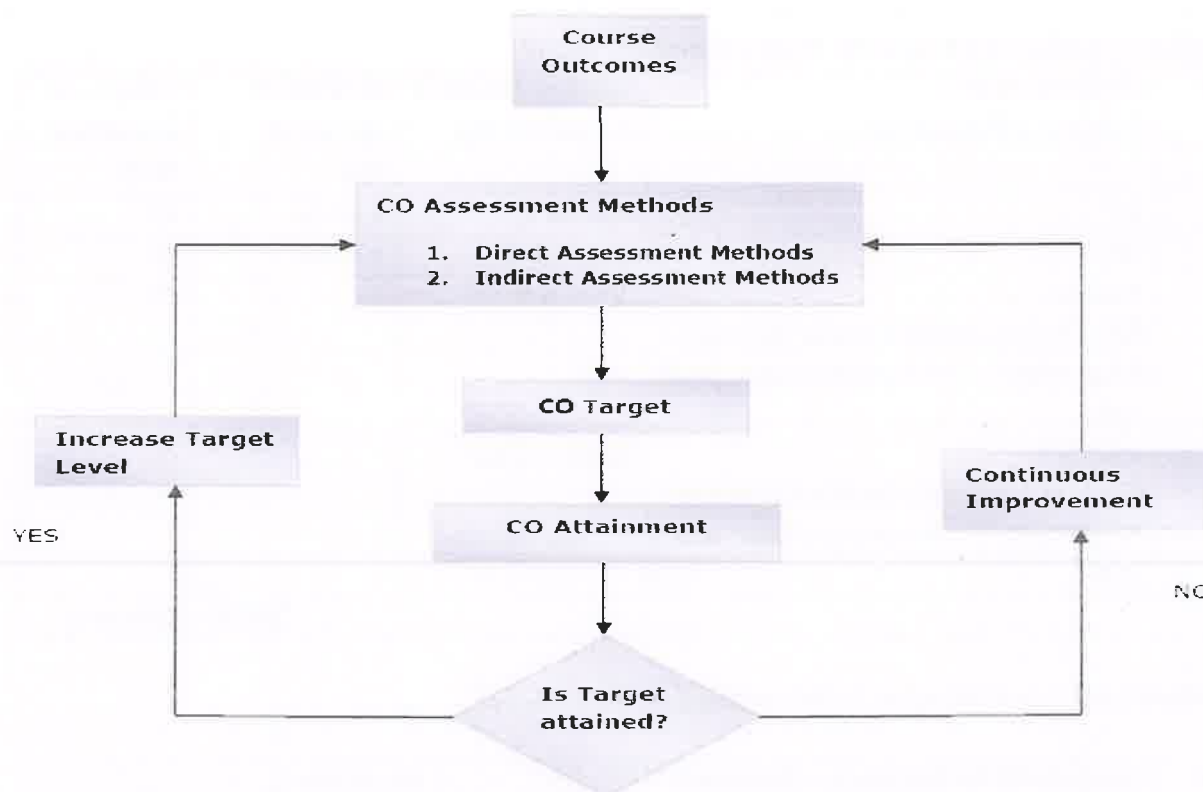
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The Process for CO Assessment is shown below,



Record the attainment of Course Outcomes of all courses with respect to set attainment levels

Measuring Course Outcomes attained through End Semester Examination (ESE) and Continuous Assessment Tests (CAT)

- Attainment of COs is directly measured from the performance of students in Continuous Assessment Tests (CAT) and from the course marks of students in End Semester Examinations (ESE).
- For assessing the attainment of course outcomes in internal components, each CO of the course is mapped to individual questions and target attainment levels are fixed for each CO for each assessment pattern.




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- For End Semester Examination, the attainment of individual COs cannot be assessed as it is not accessible by the department. So, overall pass % of students is considered for arriving at the attainment of all the COs of that course.

Continuous Assessment Process for Theory Courses for R2017

S.No	Components of Continuous Assessment	Syllabus Coverage for internal test	Duration of the test in Hrs.	Continuous assessment Mark
1	CAT I	Unit I & II	1 ½ Hrs	15
2	CAT II	Unit III & IV	1 ½ Hrs	15
3	Activity I (Quiz/ Activity based learning/ Seminars / Assignments / mini-project/Open Book Test)	Unit I & II	-	05
4	Activity II (Quiz/ Activity based learning/ Seminars / Assignments / mini-project/Open Book Test)	Unit III, IV & V	-	05
TOTAL				40 Marks

Continuous Assessment Process for Laboratory Courses for R2017

S.No	Components for Continuous Assessment	Marks (max.)
1	PAT I	15
2	PAT II	15
3	Conduction of experiment	20
TOTAL		50 Marks

Continuous Assessment Process for Theory Courses with Lab Component Courses for R2017

S.No	Components for Continuous Assessment	Marks (max.)
1	CAT I	15
2	CAT II	15
3	Conduction of experiment	20
TOTAL		50 Marks




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Scheme of Assessment for R2017 with End Semester

S.No	Course Type	Mark Breakup*										
		Continuous Assessment Components								End Semester Components		
		CAT 1 / PAT 1	CAT 2 / PAT 2	Activity / Attendance	Conduct of Experiment	Review 1 / Report	Review 2 / Report	Final exam / Project Evaluation	Total	Theory Written exam	Practical exam and Viva-voce	Project Report and Viva-voce Project Evaluation
1.	Theory course	15	15	10	-	-	-		40	60 (100)	-	-
2.	Theory course with lab component	15	15	-	20	-	-		50	50 (100)	-	-
3.	Laboratory Course	15	15	-	20	-	-		50	-	50 (100)	-
4.	Life Skills	25	25	-	-	-	-	50	100	-	-	-
5.	Engineering Graphics	-	-	25	-	-	-	25	50	50 (100)	-	-
6.	Mini Project	-	-	-	-	25	25	50	100	-	-	50 (100)
7.	Project					25	25	-	50	-	-	50 (100)
8.	Technical Seminar	-	-	-	-	50	50	-	100	-	-	-
9.	Technical English & Language Elective	25	25	-	-	-	-	50	100	-	-	-




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Continuous Assessment Process for Theory Courses for R2019

S.No	Components of Continuous Assessment	Syllabus Coverage for internal test	Duration of the test in Hrs.	Marks
1	CAT I	Module I & II	1 ½ Hrs	15
2	CAT II	Module III & IV	1 ½ Hrs	15
3	Activity I (Quiz/ Activity based learning/ Seminars / Assignments / mini-project/Open Book Test)	Module I & II	-	05
4	Activity II (Quiz/ Activity based learning/ Seminars / Assignments / mini-project/Open Book Test)	Module III, IV & V	-	05
TOTAL				40 Marks

Continuous Assessment Process for Laboratory Courses for R2019

S.No	Components for Continuous Assessment	Marks
1	PAT I	15
2	PAT II	15
3	Conduction of experiment	20
TOTAL		50 Marks

Continuous Assessment Process for Theory Courses with Lab Component Courses for R2019

(This is in addition to the assessment of theory)

S.No	Components for Continuous Assessment	Marks
1	PAT I	15
2	PAT II	15
3	Conduction of experiment	20
TOTAL		50 Marks




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Scheme of Assessment for R2019 with End Semester

S.No	Course Type	Mark Breakup*										
		Continuous Assessment Components							End Semester Components			
		CAT 1 / PAT 1	CAT 2 / PAT 2	Activity / Attendance	Conduct of Experiment	Review 1	Review 2	Final exam / Project Evaluation	Total	Theory Written exam	Practical exam and Viva-voce	Project Report and Viva-voce Project Evaluation
1.	Theory Courses	15	15	10	-	-	-	40	60 (100)	-	-	
2.	Theory Courses with lab component	15	15	-	20	-	-	50	50 (100)	-	-	
3.	Laboratory Courses	15	15	-	20	-	-	50	-	50 (100)	-	
4.	Life Skills	25	25	-	-	-	-	50	100	-	-	
5.	Engineering Graphics	-	-	25	-	-	-	25	50 (100)	-	-	
6.	Mini Project	-	-	-	-	25	25	50	100	-	50 (100)	
7.	Project	-	-	-	-	25	25	-	50	-	50 (100)	




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Measuring Course Outcomes attained through End Semester Examination (ESE) and Continuous Assessment Tests (CAT)

- Attainment of COs is directly measured from the performance of students in Continuous Assessment Tests (CAT) and from the course marks of students in End Semester Examinations (ESE).
- For assessing the attainment of course outcomes in internal components, each CO of the course is mapped to individual questions and target attainment levels are fixed for each CO for each assessment pattern.

CO Attainment calculation procedure

- COs are framed for a subject based on its contents.
- Relationship between COs and POs / PSOs are found.
- Appropriate Content delivery methods and assessment methods are identified
- Detailed lesson plan is prepared
- As per the lesson plan, subject is taught
- Marks scored by all students in tests, tutorials, assignments, etc are collected
- If necessary, suitable co-curricular and extracurricular activities are organized
- Course end survey forms are collected
- All the data are entered in the Excel sheet for attainment calculation of COs.
- Suitable Benchmark is set based on students performance
- Attainment calculation is done
- Level of COs attainment is found
- If attainment level of all COs is above or equal to the target level, the benchmark is increased for the next year.
- Otherwise, necessary actions are prescribed for the next year.




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