## 2.6.2 Attainment of *programme outcomes* and *course outcomes* are *evaluated* by the institution.

**PO.1.Engineering knowledge:**Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

**PO.2.Problem analysis:**Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

**PO.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.

**PO.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.

**PO.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.

**PO.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.

**PO.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.

**PO.8. Ethics:**Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

**PO.9. Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

**PO.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.

**PO.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.

**PO.12. Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

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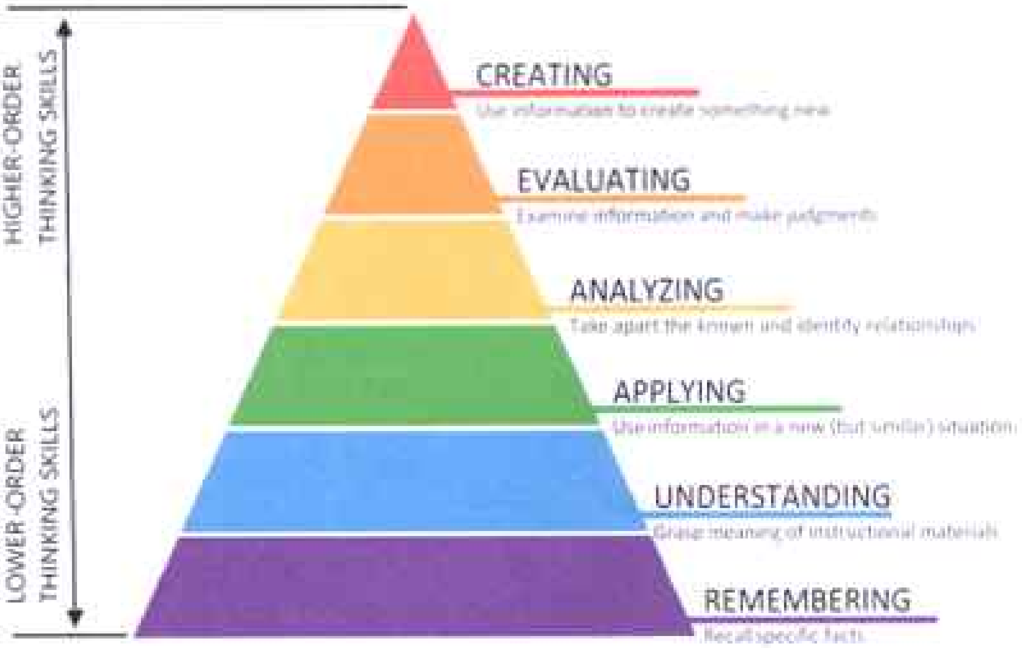
**PROGRAM SPECIFIC OUTCOMES:**

PSO 1: Ability to design, simulate & analysis of electrical systems using different software tools.

PSO 2: Will be able to design & build renewable energy system

BLOOM'S TAXONOMY – COGNITIVE DOMAIN (2001)




## Response:

The evaluation of Program Outcomes (POs) and Course Outcomes (COs) is a critical component of educational assessment. It helps determine the extent to which students have achieved the intended learning outcomes and provides valuable insights into the effectiveness of the curriculum and instructional methods. In this response, we will explain how the attainment of POs and COs is evaluated, along with the use of evidence to support the evaluation process. Evaluation of POs involves assessing the overall achievement of the desired program-level outcomes. By evaluating students' work directly, we can assess the extent to which POs are being achieved.

For the Attainment of CO's, PO's and PSO's The Swarna Bharathi Institute Of Science and Technology has defined and considered CO's for each course which are framed in JNTUH curriculum .A correlation is established between CO's PO's and PSO's with 3 scale that is 1to 3 as follows.

1. for Low
2. for Medium
3. for High

For mapping CO's ,PO's,PSO's for all the courses ,matrices are merged to form a program level CO-PO-PSO matrics. There are two methods for assessments and evaluating the attainments levels.those are

1.Direct Assesment
2.Indirect Assesment

The Avanthi Institute of Engineering and Technology follows direct Assesment for CO,PO attainments by considering internal and external Examinations . CO attainment is calculated bases on the performance of the students using various assessment tools such as CIE and SEE .

For levels for attainment the Institute has considered upon the Percentage of students in program who have got 60%above in CIE and 40% or E grade in SEE

| **% of students score greater than or equal to set target** | **CO Attainment Level** |
|---|---|
| 60% above | Level 3 |
| 50-60% | Level 2 |
| 40-50% | Level 1 |

For division of marks by the University and weightage arrived at the attainment of CO's are Explained through the following table

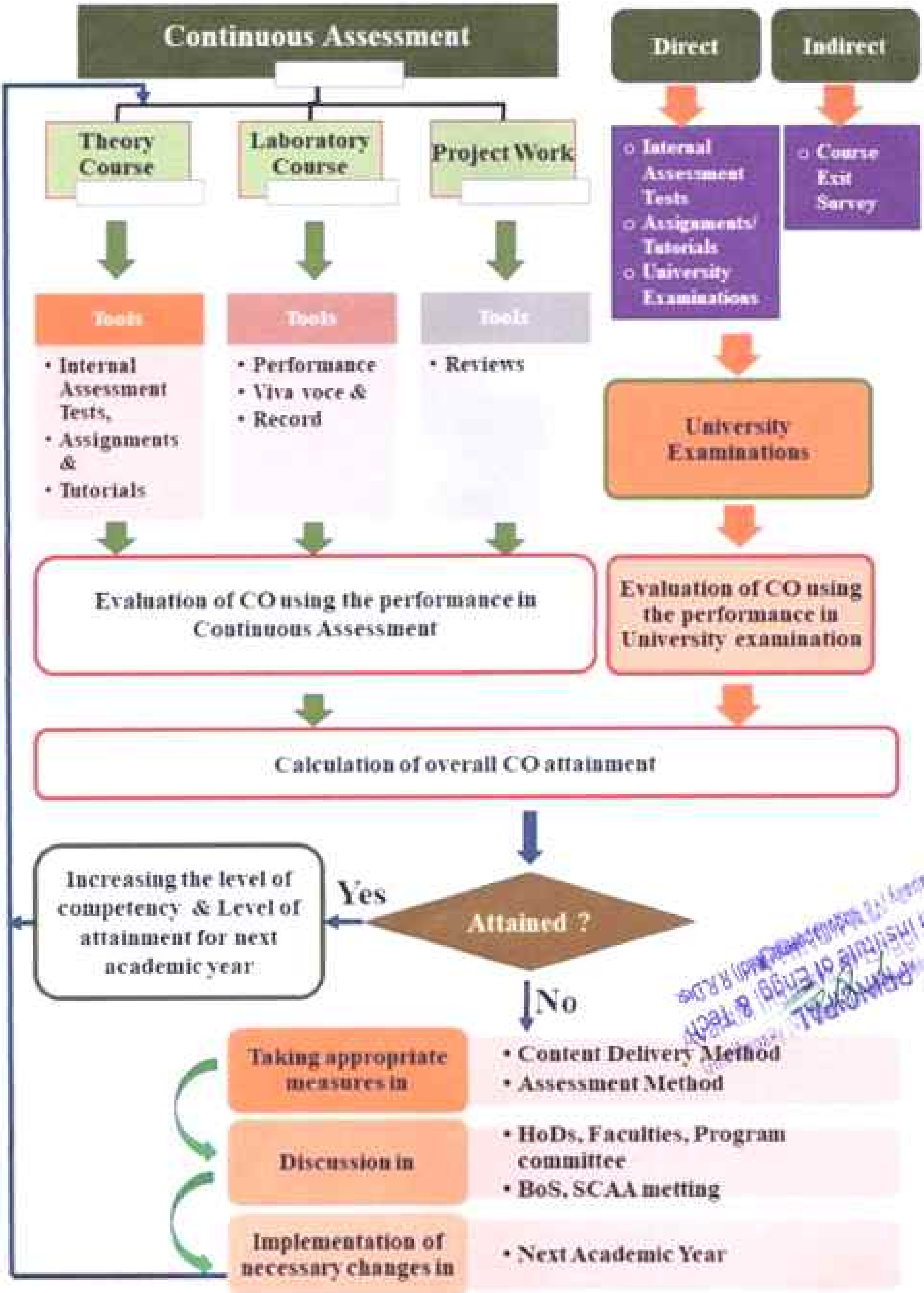
| Type of Course | Internal Marks CIE(mid/assingnment) | External Marks SEE | Total Marks | Final Attainment Level |
|---|---|---|---|---|
| Theory | **25** | **75** | **100** | 0.25(Internal attainment) 0.75(External attainment) |
| Laboratory | **25** | **75** | **100** | 0.25(Internal attainment) 0.75(External attainment) |
| seminar | **100** | -- | **100** | CIE |
| Industry oriented Mini project | -- | 100 | **100** | **SEE** |
| Major Project | **25** | **75** | **100** | 0.25(Internal attainment) 0.75(External attainment) |

For direct assessment measures, evidence includes the quality of students' projects, portfolios, or performance assessments. The evidence demonstrates students' ability to meet the specific criteria and standards set for each PO. In the case of indirect assessment methods, evidence includes survey responses, interview transcripts, and feedback from stakeholders.
The evaluation of COs focuses on the assessment of specific learning outcomes for individual courses. Like with POs, direct assessment measures are commonly used to evaluate COs. These measures include exams, quizzes, assignments, presentations, and laboratory work. The

assessments are designed to measure students' understanding and mastery of the specific learning outcomes outlined for each course.

Evidence for the evaluation of COs includes student work samples, exam scores, and assessment results. For example, students' Mid and assignments exams are analyzed to determine the extent to which they have met the specific learning outcomes.

The evaluation of POs and COs is crucial for assessing the achievement of intended learning outcomes in educational programs and courses. Direct assessment measures, such as mid exams and assignments, provide evidence of student performance and attainment.


Continuous Assessment
Direct
Indirect
Theory Course
Laboratory Course
Project Work
Internal Assessment Tests
Assignments/ Tutorials
University Examinations
Course Exit Survey
Tools
Internal Assessment Tests,
Assignments &
Tutorials
Tools
Performance
Viva voce &
Record
Tools
Reviews
University Examinations
Evaluation of CO using the performance in Continuous Assessment
Evaluation of CO using the performance in University examination
Calculation of overall CO attainment
Increasing the level of competency & Level of attainment for next academic year
Yes
Attained ?
No
Taking appropriate measures in
Content Delivery Method
Assessment Method
Discussion in
HoDs, Faculties, Program committee
BoS, SCAA metting
Implementation of necessary changes in
Next Academic Year

## Theory courses:

For each theory course, faculty member calculates the course outcome attainment using University Examination and Internal Assessment Test. The attainment level will be calculated based on the average performance levels of both University Examination and Internal Assessment Test. The evaluation process of Internal Assessment Tests/Assignments/Tutorial is counted for 25%

and the remaining 75% will be given for university examination. Based on the level of CO attainment, the faculty member will decide whether to increase the competency level or change the content delivery method, assessment methods to improve attainment level for the course..

| | Assessment Tool | weightage | Frequency |
|---|---|---|---|
| **CO Attainment** | **Internal Assessment Tests** | **25%** | **Twice in a Semester** |
| | **University Examination** | **75%** | **Once in a Semester** |

**Laboratory Courses:**

For laboratory courses, the course outcome will be calculated based on performance, viva-voce, record work and model practical examination with the weightage of 25% for Continuous Internal Assessment and 75 % weightage for University Practical Examination. Based on the CO attainment level, the faculty member will decide whether to increase the competency level or enhance the practical knowledge of the students in order to improve attainment level for the laboratory course.

| | Assessment Tool | weightage | Frequency |
|---|---|---|---|
| **CO Attainment** | **Continuous Internal Assessment** | **25%** | **Every Week** |
| | **University Practical Examination** | **75%** | **Once in a Semester** |

**Project Work Assessment:**

For project work, Continuous Internal Assessment is based on the performance in the three reviews. The Course Attainment is calculated based on the three reviews and project Viva voce.

- Project review is conducted every month to review the progress of the project and the second review will be conducted in the presence of an industry expert.
- Suggestions are given to the students for their continuous update and improvement.
- Evaluation of each review is based on the parameters discussed in teaching learning process.

The faculty member will decide the competency level and attainment level for project work considering the average performance level of the students

| Assessment Tool | | weightage | Frequency |
|---|---|---|---|
| **Continuous Assessment** | Reviews | **25%** | Every Month |
| University Assessment | Viva-Voce | **75%** | **Once in a Semester** |

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## CO Attainment Calculation:

The course outcomes for all the courses are calculated in terms of percentage using the formula.

$$\text{COx in \%} = \frac{\text{Marks obtained by the students in COx}}{\text{Maximum Marks alloted in COx}} \times 100$$

Where, x= [1 to N], N= Number of COs.

Each course outcome is calculated for all the students based on marks obtained by the students.

$$COx\ Attainment\ in\ \% \\ = no.\ of\ Students\ scored\ more\ than\ or\ equal\ to\ 60\%\ of\ Marks\ in\ COx\ / \\ no.\ of\ Students$$

Where, x= [1 to N], N= Number of Course Outcomes

Overall CO Attainment:
The Overall Attainment for a course is sum of 25% of Internal Assesment Test Attainment Level and 75% of University Attainment Level.

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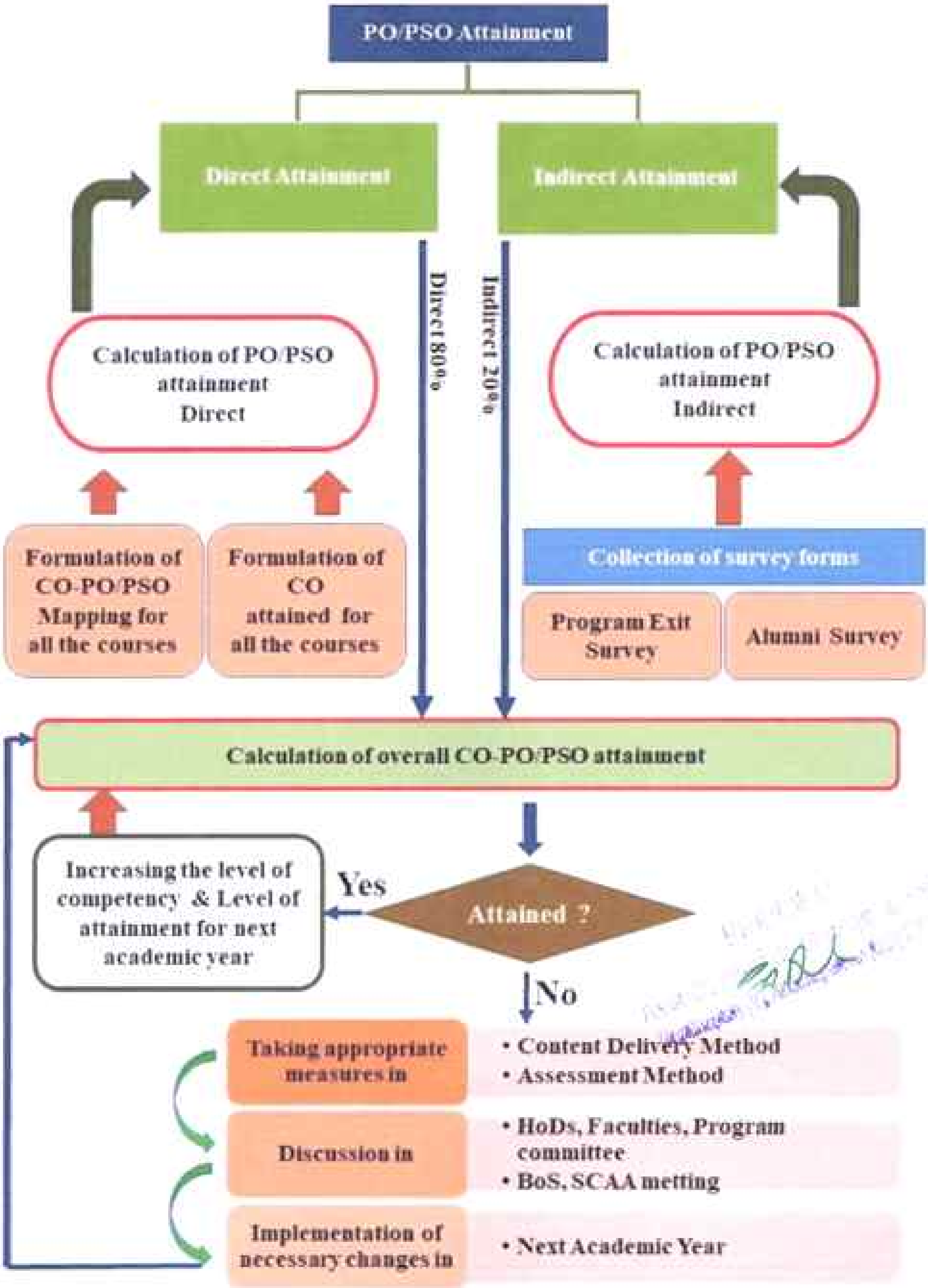
PO/PSO Attainment
Direct Attainment
Indirect Attainment
Direct 80%
Indirect 20%
Calculation of PO/PSO attainment Direct
Calculation of PO/PSO attainment Indirect
Formulation of CO-PO/PSO Mapping for all the courses
Formulation of CO attained for all the courses
Collection of survey forms
Program Exit Survey
Alumni Survey
Calculation of overall CO-PO/PSO attainment
Increasing the level of competency & Level of attainment for next academic year
Yes
Attained ?
No
Taking appropriate measures in
• Content Delivery Method
• Assessment Method
Discussion in
• HoDs, Faculties, Program committee
• BoS, SCAA metting
Implementation of necessary changes in
• Next Academic Year

## PO/PSO Assessment Tools:

Evaluation of attainment of POs and PSOs is based on direct and indirect assessment tools. Direct assessment of POs and PSOs is based on students' performance in Continuous Assessments and University Examination. Indirect assessment is based on Program Exit Survey, Alumni Survey and Course Exit Survey (Theory and Practical).

Indirect Assessment:
The following tools are used to assess the indirect assessment of attainment of COs, POs and PSOs.

| S.no | Tools used for Assessment processes | | | | |
|---|---|---|---|---|---|
| POs, PSOs Indirect Assessment Tools | | | | | |
| 1 | Program Exit Survey | ✓ | ✓ | ✓ | ✓ |
| 2 | Alumni Survey | | | | |
| CO Attainment Indirect Assessment Tool | | | | | |
| 3 | Course Exit Survey | ✓ | ✓ | ✓ | ✓ |

**Course Exit Survey (Theory & Practical):**
The course exit survey is process of collecting reviews on each course from the students at the end of each semester. It helps to improve the overall aspect of the course in future semesters. The survey covers the overall view about teaching and learning of the respective course. The survey form reveals the following attributes:
*Course Content- Quality of the content provided, incorporation of Outcome Based Education
*Course Delivery- Experience about the teaching methodologies, ICT tools, NPTEL resource utilization.
*Course Assessment- Methodology of evaluation, feedbacks on assignments and tutorials
*General suggestions for improvement.

**Program Exit Survey**:
It is a process of collecting satisfaction survey on the quality of education from the perspective of graduating students upon the completion of their program. Program Exit Survey is structured with 5 likert scale questions. The survey helps in identifying

- Perception on the overall quality of teaching, learning and mentoring. Opinion about the support provided by the programme in projects, modern tools and softwares.
- Support provided for extra-curricular and co-curricular activities
- Exposure to the competitive exams and personality development programmes.
- Insight on imparting skills like entrepreneurship and societal responsibility through NSS, YRC, NGO and Club's
- Improvement on facilities.

**PO & PSO Attainment Calculation of PES:**
Question Level Calculation:
Q(x) in %
*no. of Students provided more than or equal to 3 Marks in Q(x) / no. of Students* X100
Where, x= [1 to 25], Q[x]=xth Questions in Program Exit Survey

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Question Level Attainment:

| | | |
|---|---|---|
| Program Exit Survey (PES) Question Level Attainment | 3 | 80% of the Students provided more than orequal to 3 Marks in Survey Question |
| | 2 | 70% of the Students provided more than or equal to 3 Marks in Survey Question |
| | 1 | 60% of the Students provided more than or equal to 3 Marks in Survey Question |

$$POm\ Attainment\ of\ PES = \frac{\sum x\ (x) inment\ mapped\ with\ POm}{x}$$

Where, m= [1 to M], M= Number of Program Outcomes
x=Number of Questions mapped with POm

$$PSOm\ Attainment\ of\ PES = \frac{\sum x\ PO(x) Attainment\ mapped\ with\ PSOm}{x}$$

Where, m= [1 to M], M= Number of Program Specific Outcomes.
x=Number of POs mapped with PSOm

**process for Indirect PO attainment.**

| PO Attainment | Tools | Process |
|---|---|---|
| Indirect | • Program Exit Survey | On completion of program, a feedback is obtained from each student about the entire program experience. |
| | • Alumni Survey | During the alumni meet, graduation day the alumni survey are collected from the graduates based on the various parameters. |

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**CourseName: ELECTRICAL AND HYBRID VEHICLES  Year of Study: IV-I**

Upon Completion of the course student will be able to:

| **Course Outcomes** | |
|---|---|
| CO1 | demonstrate the ability to Understand the models to describe hybrid vehicles and their performance |
| CO2 | Apply load compensation techniques to control reactive power |
| CO3 | Understand the application of per unit quantities. |
| CO4 | Different types of motors used in electric and hybrid electric vehicles |
| CO5 | Different types of energy storage systems |

Perform the CO mapping with PO and PSO

| CO-PO Mapping | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** |
| CO1 | 3 | 3 | | | | | | | | | | 3 | 3 | 2 |
| CO2 | 3 | | 2 | | 2 | | | | | | | 3 | | 2 |
| CO3 | 2 | 3 | 3 | 3 | | | | | | | | 3 | 2 | 2 |
| CO4 | 3 | 3 | | 3 | 2 | | | | | | | 3 | | |
| CO5 | | | 3 | 2 | | | | | | | | 3 | 1 | |

**Dept of EEE, Regulation:R18 , Subject:ELECTRICAL AND HYBRID VEHICLES Year & Sem: IV-I (MID-I)**

| Calculation standards of attainment | | | | Faculty:M.Ragini Assistant Professor, Dept. of EEE |
|---|---|---|---|---|
| | 1:Low(40%) | 2:Medium(60%) | 3: High(75%) | |
| Descriptive (10M) | 4 | 6 | 7.5 | |
| Assignment(5M) | 4 | 6 | 7.5 | |
| Quiz(10M) | 4 | 6 | 7.5 | |

Cycle#1

| S.NO | REGD.NO | CO1(Max:10M) Q1 (10M) | Q2 (10M) | Total | Att Level | CO2(Max:10M) Q3 (10M) | | Total | Att Level | CO3(Max:10M) Q4 (10M) | | Total | Att Level | BEST OF CO2,CO3 | Total Marks (20M) | Final Marks (10M) | Obj Marks (Max:10) | Q1 (Avg:10) CO1/CO2/CO3 | Att. Level | Assignments A (5M) (CO1) | Att. Level | Avg(D/Q/A) Attainment Level (CO1) | Avg(D/Q/A) Attainment Level(CO2) | Avg(D/Q/A) Attainment Level (CO3) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 20Q61A0201 | 10 | 5 | 10 | 3 | 10 | | 10 | 3 | 0 | | 0 | 0 | 10 | 20 | 10 | 7 | 7 | 2 | 5 | 3 | 2.67 | 2.67 | 1.67 |
| 2 | 20Q61A0202 | 6 | 0 | 6 | 2 | 6 | | 6 | 2 | 0 | | 0 | 0 | 6 | 12 | 6 | 5 | 5 | 1 | 5 | 3 | 2.00 | 2.00 | 1.33 |
| 3 | 20Q61A0204 | 6 | 0 | 6 | 2 | 6 | | 6 | 2 | 0 | | 0 | 0 | 6 | 12 | 6 | 5 | 5 | 1 | 5 | 3 | 2.00 | 2.00 | 1.33 |
| 4 | 20Q61A0205 | 9 | 0 | 9 | | 10 | | 10 | 3 | | | 0 | 0 | 10 | 19 | 10 | 7 | 7 | 2 | 5 | 3 | 2.50 | 2.67 | 1.67 |
| 5 | 20Q61A0206 | 7 | 0 | 7 | 2 | 6 | | 6 | 2 | | | 0 | 0 | 6 | 13 | 7 | 5 | 5 | 1 | 5 | 3 | 2.00 | 2.00 | 1.33 |
| 6 | 20Q61A0207 | 10 | 0 | 10 | 3 | 10 | | 10 | 3 | | | 0 | 0 | 10 | 20 | 10 | 7 | 7 | 2 | 5 | 3 | 2.67 | 2.67 | 1.67 |
| 7 | 20Q61A0208 | 6 | | 6 | 2 | 6 | | 6 | 2 | | | 0 | 0 | 6 | 12 | 6 | 5 | 8 | 3 | 5 | 3 | 2.67 | 2.67 | 2.00 |
| 8 | 20Q61A0209 | 10 | 5 | 10 | 3 | | | | 0 | 8 | | 8 | 3 | 8 | 18 | 9 | 7 | 7 | 2 | 5 | 3 | 2.67 | 1.67 | 2.67 |
| 9 | 21Q65A0201 | 10 | | 10 | 3 | 9 | | 9 | 3 | 0 | | 0 | 0 | 9 | 19 | 10 | 8 | 8 | 3 | 5 | 3 | 3.00 | 3.00 | 2.00 |
| 10 | 21Q65A0202 | 7 | | 7 | 2 | 7 | | 7 | 2 | | | 0 | 0 | 7 | 14 | 7 | 6 | 6 | 2 | 5 | 3 | 2.33 | 2.33 | 1.67 |
| 11 | 21Q65A0203 | 9 | 0 | 9 | 3 | 8 | | 8 | 3 | 0 | | 0 | 0 | 8 | 17 | 9 | 6 | 6 | 2 | 5 | 3 | 2.67 | 2.67 | 1.67 |
| 12 | 21Q65A0204 | 10 | | 10 | 3 | 9 | | 9 | 3 | 0 | | 0 | 0 | 9 | 19 | 10 | 5 | 5 | 1 | 5 | 3 | 2.33 | 2.33 | 1.33 |
| 13 | 21Q65A0205 | 9 | 8 | 9 | 3 | 10 | | 10 | 3 | 0 | | 0 | 0 | 10 | 19 | 19 | 8 | 8 | 3 | 5 | 3 | 3.00 | 3.00 | 2.00 |
| 14 | 21Q65A0207 | 5 | | 5 | 1 | 4 | | 4 | 1 | 0 | | 0 | 0 | 4 | 9 | 17 | 5 | 5 | 1 | 5 | 3 | 1.67 | 1.67 | 1.33 |
| 15 | 21Q65A0208 | | 6 | 6 | 2 | 10 | | 8 | 3 | 0 | | 0 | 0 | 8 | 14 | 13 | 6 | 6 | 2 | 5 | [illegible] | [illegible] | [illegible] | 1.67 |
| 16 | 21Q65A0209 | 8 | | 8 | 3 | 10 | | 10 | 3 | 0 | | 0 | 0 | 10 | 18 | 17 | 7 | 7 | 2 | 5 | 3 | [illegible] | [illegible] | [illegible] |
| 17 | 21Q65A0210 | 10 | 0 | 10 | 3 | 9 | | 9 | 3 | 0 | | 0 | 0 | 9 | 19 | 10 | 8 | 8 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 2.00 |
| 18 | 21Q65A0211 | 8 | | 8 | 3 | 9 | | 9 | 3 | 0 | | 0 | 0 | 9 | 17 | 9 | 7 | 7 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 1.67 |
| 19 | 21Q65A0212 | | 7 | 7 | 2 | 10 | | 10 | 3 | 0 | | 0 | 0 | 10 | 17 | 9 | 8 | 8 | 3 | 5 | 3 | 2.67 | 3.00 | 2.00 |
| 20 | 21Q65A0213 | 9 | | 9 | 3 | 9 | | 9 | 3 | | | 0 | 0 | 9 | 18 | 9 | 9 | 9 | 3 | 5 | 3 | 3.00 | 3.00 | 2.00 |
| 21 | 21Q65A0214 | 9 | | 9 | 3 | 7 | | 7 | 2 | 0 | | 0 | 0 | 7 | 16 | 8 | 5 | 5 | 1 | 5 | 3 | 3.33 | 2.00 | 1.33 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 22 | 21Q65A0215 | 8 | | 8 | 3 | 9 | | 9 | 3 | 0 | | 0 | 0 | 9 | 17 | 9 | 10 | 10 | 3 | 5 | 3 | 3.00 | 3.00 | 2.00 |
| 23 | 21Q65A0216 | | 9 | 9 | 3 | 10 | | 10 | 3 | 0 | | 0 | 0 | 10 | 19 | 10 | 6 | 6 | 2 | 5 | 3 | 2.67 | 2.67 | 1.67 |
| 24 | 21Q65A0218 | 10 | 8 | 10 | 3 | 5 | | 5 | 1 | 0 | | 0 | 0 | 5 | 15 | 8 | 9 | 9 | 3 | 5 | 3 | 3.00 | 2.33 | 2.00 |
| 25 | 21Q65A0219 | | 9 | 9 | 3 | 9 | | 9 | 3 | 0 | | 0 | 0 | 9 | 18 | 9 | 10 | 10 | 3 | 5 | 3 | 3.00 | 3.00 | 2.00 |
| 26 | 21Q65A0220 | 9 | | 9 | 3 | 8 | | 8 | 3 | | | 0 | 0 | 8 | 17 | 9 | 0 | 0 | 0 | 5 | 3 | 2.00 | 2.00 | 1.00 |
| 27 | 21Q65A0221 | 9 | | 9 | 3 | 9 | | 9 | 3 | 0 | | 0 | 0 | 9 | 18 | 9 | 6 | 6 | 2 | 5 | 3 | 2.67 | 2.67 | 1.67 |
| 28 | 21Q65A0222 | | 9 | 9 | 3 | 9 | | 9 | 3 | 0 | | 0 | 0 | 9 | 18 | 9 | 10 | 10 | 3 | 5 | 3 | 3.00 | 3.00 | 2.00 |
| 29 | 21Q65A0223 | 9 | | 9 | 3 | 10 | | 10 | 3 | 0 | | 0 | 0 | 10 | 19 | 10 | 10 | 10 | 3 | 5 | 3 | 3.00 | 3.00 | 2.00 |
| 30 | 21Q65A0224 | | 8 | 8 | 3 | 7 | | 7 | 2 | 0 | | 0 | 0 | 7 | 15 | 8 | 10 | 10 | 3 | 5 | 3 | 3.00 | 2.67 | 2.00 |
| 31 | 21Q65A0225 | 7 | | 7 | 2 | 8 | | 8 | 3 | 0 | | 0 | 0 | 8 | 15 | 8 | 9 | 9 | 3 | 5 | 3 | 2.67 | 3.00 | 2.00 |
| 32 | 21Q65A0226 | | 9 | 9 | 3 | 8 | | 8 | 3 | 0 | | 0 | 0 | 8 | 17 | 9 | 10 | 10 | 3 | 5 | 3 | 3.00 | 3.00 | 2.00 |
| 33 | 21Q65A0227 | 10 | | 10 | 3 | 6 | | 6 | 2 | | | 0 | 0 | 6 | 16 | 8 | 0 | 0 | 0 | 5 | 3 | 2.00 | 1.67 | 1.00 |
| 34 | 21Q65A0228 | 7 | | 7 | 2 | 9 | | 9 | 3 | 0 | | 0 | 0 | 9 | 16 | 8 | 9 | 9 | 3 | 5 | 3 | 2.67 | 3.00 | 2.00 |
| 35 | 21Q65A0229 | 10 | 5 | 10 | 3 | 8 | | 8 | 3 | 0 | | 0 | 0 | 8 | 18 | 9 | 9 | 9 | 3 | 5 | 3 | 3.00 | 3.00 | 2.00 |
| 36 | 21Q65A0230 | 8 | | 8 | 3 | 10 | | 10 | 3 | 0 | | 0 | 0 | 10 | 18 | 9 | 9 | 9 | 3 | 4 | 3 | 3.00 | 3.00 | 2.00 |
| 37 | 21Q65A0231 | | 7 | 7 | 2 | 7 | | 7 | 2 | 0 | | 0 | 0 | 7 | 14 | 7 | 7 | 7 | 2 | 5 | 3 | 2.33 | 2.33 | 1.67 |
| 38 | 21Q65A0232 | 9 | | 9 | 3 | 10 | | 10 | 3 | 0 | | 0 | 0 | 10 | 19 | 10 | 6 | 6 | 2 | 5 | 3 | 2.67 | 2.67 | 1.67 |
| 39 | 21Q65A0233 | 9 | | 9 | 3 | 10 | | 10 | 3 | 0 | | 0 | 0 | 10 | 19 | 10 | 10 | 10 | 3 | 5 | 3 | 3.00 | 3.00 | 2.00 |
| 40 | 21Q65A0235 | 10 | | 10 | 3 | 9 | | 9 | 3 | 0 | | 0 | 0 | 9 | 19 | 10 | 9 | 9 | 3 | 5 | 3 | 3.00 | 3.00 | 2.00 |
| 41 | 21Q65A0236 | 9 | | 9 | 3 | 9 | | 9 | 3 | 0 | | 0 | 0 | 9 | 18 | 9 | 9 | 9 | 3 | 4 | 3 | 3.00 | 3.00 | 2.00 |
| 42 | 21Q65A0237 | 10 | | 10 | 3 | | | | | 9 | | 9 | 3 | 9 | 19 | 10 | 10 | 10 | 3 | 5 | 3 | 3.00 | 3.00 | 3.00 |
| 43 | 21Q65A0238 | 10 | | 10 | 3 | 9 | | 9 | 3 | 0 | | 0 | 0 | 9 | 19 | 10 | 10 | 10 | 3 | 5 | 3 | 3.00 | 3.00 | 2.00 |
| 44 | 21Q65A0239 | 9 | 6 | 9 | 3 | 8 | | 8 | 3 | 0 | | 0 | 0 | 8 | 17 | 9 | 9 | 9 | 3 | 5 | 3 | 3.00 | 3.00 | 2.00 |
| 45 | 21Q65A0240 | 9 | | 9 | 3 | 9 | | 9 | 3 | 0 | | 0 | 0 | 9 | 18 | 9 | 5 | 5 | 1 | 5 | 3 | 2.33 | 2.33 | 1.33 |
| 46 | 21Q65A0242 | 7 | 7 | 7 | 2 | 9 | | 9 | 3 | 1 | | 1 | 0 | 9 | 16 | 8 | 9 | 9 | 3 | 5 | 3 | 2.67 | 3.00 | 2.00 |
| 47 | 21Q65A0243 | | 10 | 10 | 3 | 8 | | 8 | 3 | 0 | | 0 | 0 | 8 | 18 | 9 | 7 | 7 | 2 | 5 | 3 | 2.67 | 2.67 | 1.67 |
| 48 | 21Q65A0244 | 10 | | 10 | 3 | 8 | | 8 | 3 | 0 | | 0 | 0 | 8 | 18 | 9 | 8 | 8 | 3 | 4 | 3 | 3.00 | 3.00 | 2.00 |
| 49 | 21Q65A0245 | 10 | 4 | 10 | 3 | 9 | | 9 | 3 | 0 | | 0 | 0 | 9 | 19 | 10 | 9 | 9 | 3 | 5 | 3 | 3.00 | 3.00 | 2.00 |

| Attainment Level Summary | CO1 | CO2 | CO3 |
|---|---|---|---|
| Maximum Attainment Level | 3 | 3 | 3 |
| Cut-off Attainment Level(60%) | 1.8 | 1.8 | 1.8 |
| No.of Student >=Cut-off | 48 | 46 | 27 |
| % of students >=cut-off | 98 | 94 | 55 |
| Level Attained | 3 | 3 | 1 |
| **Level of Attained** | | | |
| **% of students** | <60 | 60-79 | >=80 |
| **Level** | 1 | 2 | 3 |

**Faculty**

Avanthi Institute of Engg. & Tech
Gunthapally (V), Abdullapurmet (M), R.R.Dt.

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NAAC "B++" Accredited Institute

Gunthapally (V), Abdullapurmet (M), RR Dist, Near Ramoji Film City, Hyderabad - 501512

www.aietg.ac.in email: principal.avanthi@gmail.com

**Dept of EEE, Regulation:R18 , Subject:ELECTRICAL AND HYBRID VEHICLES Year & Sem: IV-I (MID-II)**

| Calculation standards of attainment | | | | Faculty: M.Ragini Assistant Professor, Dept. of EEE |
|---|---|---|---|---|
| | *1:Low(40%)* | *2:Medium(60%)* | *3: High(75%)* | |
| Descriptive(10M) | 4 | 6 | 7.5 | |
| Assignment(5M) | 4 | 6 | 7.5 | |
| Quiz(10M) | 4 | 6 | 7.5 | |

| S.NO | REGD.NO | Cycle#1 | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | CO1(Max:10M) | | | | CO2(Max:10M) | | | | CO3(Max:10M) | | | | | | | | | | Assignments | | | | | |
| | | Q1 (10M) | Q2 (10M) | Total | Att Level | Q3 (10M) | | Total | Att Level | Q4 (10M) | | Total | Att Level | BEST OF CO2,CO3 | Total Marks (20M) | Final Marks (10M) | QI Marks (Max:10) | QI (Avg:10) CO1/CO2/CO3 | Att. Level | A (5M) (CO1) | Att. Level | Avg(D/Q/A) Attainment Level (CO1) | Avg(D/Q/A) Attainment Level(CO2) | Avg(D/Q/A) Attainment Level (CO3) |
| 1 | 20Q61A0201 | 10 | 5 | 10 | 3 | 10 | | 10 | 3 | 0 | | 0 | 0 | 10 | 20 | 10 | 7 | 7 | 2 | 5 | 3 | 2.67 | 2.67 | 1.67 |
| 2 | 20Q61A0202 | 6 | 0 | 6 | 2 | 6 | | 6 | 2 | 0 | | 0 | 0 | 6 | 12 | 6 | 5 | 5 | 1 | 5 | 3 | 2.00 | 2.00 | 1.33 |
| 3 | 20Q61A0204 | 6 | 0 | 6 | 2 | 6 | | 6 | 2 | 0 | | 0 | 0 | 6 | 12 | 6 | 5 | 5 | 1 | 5 | 3 | 2.00 | 2.00 | 1.33 |
| 4 | 20Q61A0205 | 9 | 0 | 9 | | 10 | | 10 | 3 | | | 0 | 0 | 10 | 19 | 10 | 7 | 7 | 0 | 5 | 3 | 1.50 | 2.00 | 1.00 |
| 5 | 20Q61A0206 | 7 | 0 | 7 | 2 | 6 | | 6 | 2 | | | 0 | 0 | 6 | 13 | 7 | 5 | 5 | 1 | 5 | 3 | 2.00 | 2.00 | 1.33 |
| 6 | 20Q61A0207 | 10 | 0 | 10 | 3 | 10 | | 10 | 3 | | | 0 | 0 | 10 | 20 | 10 | 7 | 7 | 2 | 5 | 3 | 2.67 | 2.67 | 1.67 |
| 7 | 20Q61A0208 | 6 | | 6 | 2 | 6 | | 6 | 2 | | | 0 | 0 | 6 | 12 | 6 | 5 | 8 | 3 | 5 | 3 | 2.67 | 2.67 | 2.00 |
| 8 | 20Q61A0209 | 10 | 5 | 10 | 3 | | | | 0 | 8 | | 8 | 3 | 8 | 18 | 9 | 7 | 7 | 2 | 4 | 3 | 2.67 | 1.67 | 2.67 |
| 9 | 21Q65A0201 | 10 | | 10 | 3 | 9 | | 9 | 3 | 0 | | 0 | 0 | 9 | 19 | 10 | 8 | 8 | 3 | 5 | 3 | 3.00 | 3.00 | 2.00 |
| 10 | 21Q65A0202 | 7 | | 7 | 2 | 7 | | 7 | 2 | | | 0 | 0 | 7 | 14 | 7 | 6 | 6 | 2 | 5 | 3 | 2.33 | 2.33 | 1.67 |
| 11 | 21Q65A0203 | 9 | 0 | 9 | 3 | 8 | | 8 | 3 | 0 | | 0 | 0 | 8 | 17 | 9 | 6 | 6 | 2 | 5 | 3 | 2.67 | 2.67 | 1.67 |
| 12 | 21Q65A0204 | 10 | | 10 | 3 | 9 | | 9 | 3 | 0 | | 0 | 0 | 9 | 19 | 10 | 5 | 5 | 1 | 4 | 3 | 2.33 | 2.33 | 1.33 |
| 13 | 21Q65A0205 | 9 | 8 | 9 | 3 | 10 | | 10 | 3 | 0 | | 0 | 0 | 10 | 19 | 19 | 8 | 8 | 3 | 4 | 3 | 3.00 | 3.00 | 2.00 |
| 14 | 21Q65A0207 | 5 | | 5 | 1 | 4 | | 4 | 1 | 0 | | 0 | 0 | 4 | 9 | 17 | 5 | 5 | 1 | 5 | 3 | 1.67 | 1.67 | 1.33 |
| 15 | 21Q65A0208 | | 6 | 6 | 2 | 10 | | 8 | 3 | 0 | | 0 | 0 | 8 | 14 | 13 | 6 | 4 | 1 | 4 | 2 | 1.67 | 2.00 | 1.00 |
| 16 | 21Q65A0209 | 8 | | 8 | 3 | 10 | | 10 | 3 | 0 | | 0 | 0 | 10 | 18 | 17 | 7 | 7 | 2 | 4 | 3 | 2.67 | 2.67 | 1.67 |
| 17 | 21Q65A0210 | 10 | 0 | 10 | 3 | 9 | | 9 | 3 | 0 | | 0 | 0 | 9 | 19 | 10 | 8 | 8 | 3 | 5 | 3 | 3.00 | 3.00 | 2.00 |
| 18 | 21Q65A0211 | 8 | | 8 | 3 | 9 | | 9 | 3 | 0 | | 0 | 0 | 9 | 17 | 9 | 7 | 7 | 2 | 5 | 3 | 2.67 | 2.67 | 1.67 |
| 19 | 21Q65A0212 | | 7 | 7 | 2 | 10 | | 10 | 3 | 0 | | 0 | 0 | 10 | 17 | 9 | 8 | 8 | 3 | 4 | 3 | 2.67 | 3.00 | 2.00 |

| | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20 | 21Q65A0213 | 9 | | 9 | 3 | 9 | | 9 | 3 | | | 0 | 0 | 9 | 18 | 9 | 9 | 9 | 3 | 5 | 3 | 3.00 | 3.00 | 2.00 |
| 21 | 21Q65A0214 | 9 | | 9 | 3 | 7 | | 7 | 2 | 0 | | 0 | 0 | 7 | 16 | 8 | 5 | 5 | 3 | 5 | 3 | 3.00 | 2.67 | 2.00 |
| 22 | 21Q65A0215 | 8 | | 8 | 3 | 9 | | 9 | 3 | 0 | | 0 | 0 | 9 | 17 | 9 | 10 | 10 | 3 | 4 | 3 | 3.00 | 3.00 | 2.00 |
| 23 | 21Q65A0216 | | 9 | 9 | 3 | 10 | | 10 | 3 | 0 | | 0 | 0 | 10 | 19 | 10 | 6 | 6 | 2 | 5 | 3 | 2.67 | 2.67 | 1.67 |
| 24 | 21Q65A0218 | 10 | 8 | 10 | 3 | 5 | | 5 | 1 | 0 | | 0 | 0 | 5 | 15 | 8 | 9 | 9 | 3 | 5 | 3 | 3.00 | 2.33 | 2.00 |
| 25 | 21Q65A0219 | | 9 | 9 | 3 | 9 | | 9 | 3 | 0 | | 0 | 0 | 9 | 18 | 9 | 10 | 10 | 3 | 5 | 3 | 3.00 | 3.00 | 2.00 |
| 26 | 21Q65A0220 | 9 | | 9 | 3 | 8 | | 8 | 3 | | | 0 | 0 | 8 | 17 | 9 | 0 | 0 | 3 | 3 | 3 | 3.00 | 3.00 | 2.00 |
| 27 | 21Q65A0221 | 9 | | 9 | 3 | 9 | | 9 | 3 | 0 | | 0 | 0 | 9 | 18 | 9 | 6 | 6 | 2 | 5 | 3 | 2.67 | 2.67 | 1.67 |
| 28 | 21Q65A0222 | | 9 | 9 | 3 | 9 | | 9 | 3 | 0 | | 0 | 0 | 9 | 18 | 9 | 10 | 10 | 3 | 5 | 3 | 3.00 | 3.00 | 2.00 |
| 29 | 21Q65A0223 | 9 | | 9 | 3 | 10 | | 10 | 3 | 0 | | 0 | 0 | 10 | 19 | 10 | 10 | 10 | 3 | 5 | 3 | 3.00 | 3.00 | 2.00 |
| 30 | 21Q65A0224 | | 8 | 8 | 3 | 7 | | 7 | 2 | 0 | | 0 | 0 | 7 | 15 | 8 | 10 | 10 | 3 | 4 | 3 | 3.00 | 2.67 | 2.00 |
| 31 | 21Q65A0225 | 7 | | 7 | 2 | 8 | | 8 | 3 | 0 | | 0 | 0 | 8 | 15 | 8 | 9 | 9 | 3 | 5 | 3 | 2.67 | 3.00 | 2.00 |
| 32 | 21Q65A0226 | | 9 | 9 | 3 | 8 | | 8 | 3 | 0 | | 0 | 0 | 8 | 17 | 9 | 10 | 10 | 3 | 5 | 3 | 3.00 | 3.00 | 2.00 |
| 33 | 21Q65A0227 | 10 | | 10 | 3 | 6 | | 6 | 2 | | | 0 | 0 | 6 | 16 | 8 | 0 | 0 | 0 | 5 | 3 | 2.00 | 1.67 | 1.00 |
| 34 | 21Q65A0228 | 7 | | 7 | 2 | 9 | | 9 | 3 | 0 | | 0 | 0 | 9 | 16 | 8 | 9 | 9 | 3 | 5 | 3 | 2.67 | 3.00 | 2.00 |
| 35 | 21Q65A0229 | 10 | 3 | 10 | 3 | 8 | | 8 | 3 | 0 | | 0 | 0 | 8 | 18 | 9 | 9 | 9 | 3 | 5 | 3 | 3.00 | 3.00 | 2.00 |
| 36 | 21Q65A0230 | 8 | | 8 | 3 | 10 | | 10 | 3 | 0 | | 0 | 0 | 10 | 18 | 9 | 9 | 9 | 3 | 4 | 3 | 3.00 | 3.00 | 2.00 |
| 37 | 21Q65A0231 | | 7 | 7 | 2 | 7 | | 7 | 2 | 0 | | 0 | 0 | 7 | 14 | 7 | 7 | 7 | 2 | 3 | 2 | 2.00 | 2.00 | 1.33 |
| 38 | 21Q65A0232 | 9 | | 9 | 3 | 10 | | 10 | 3 | 0 | | 0 | 0 | 10 | 19 | 10 | 6 | 6 | 2 | 5 | 3 | 2.67 | 2.67 | 1.67 |
| 39 | 21Q65A0233 | 9 | | 9 | 3 | 10 | | 10 | 3 | 0 | | 0 | 0 | 10 | 19 | 10 | 10 | 10 | 3 | 5 | 3 | 3.00 | 3.00 | 2.00 |
| 40 | 21Q65A0235 | 10 | | 10 | 3 | 9 | | 9 | 3 | 0 | | 0 | 0 | 9 | 19 | 10 | 9 | 9 | 3 | 5 | 3 | 3.00 | 3.00 | 2.00 |
| 41 | 21Q65A0236 | 9 | | 9 | 3 | 9 | | 9 | 3 | 0 | | 0 | 0 | 9 | 18 | 9 | 9 | 9 | 3 | 4 | 3 | 3.00 | 3.00 | 2.00 |
| 42 | 21Q65A0237 | 10 | | 10 | 3 | | | | | 9 | | 9 | 3 | 9 | 19 | 10 | 10 | 10 | 3 | 5 | 3 | 3.00 | 3.00 | 3.00 |
| 43 | 21Q65A0238 | 10 | | 10 | 3 | 9 | | 9 | 3 | 0 | | 0 | 0 | 9 | 19 | 10 | 10 | 10 | 3 | 5 | 3 | 3.00 | 3.00 | 2.00 |
| 44 | 21Q65A0239 | 9 | 0 | 9 | 3 | 8 | | 8 | 3 | 0 | | 0 | 0 | 8 | 17 | 9 | 9 | 9 | 3 | 5 | 3 | 3.00 | 3.00 | 2.00 |
| 45 | 21Q65A0240 | 9 | | 9 | 3 | 9 | | 9 | 3 | 0 | | 0 | 0 | 9 | 18 | 9 | 5 | 5 | 1 | 5 | 3 | 2.33 | 2.33 | 1.33 |
| 46 | 21Q65A0242 | 7 | 7 | 7 | 2 | 9 | | 9 | 3 | 1 | | 1 | 0 | 9 | 16 | 8 | 9 | 9 | 3 | 5 | 3 | 2.67 | 3.00 | 2.00 |
| 47 | 21Q65A0243 | | 10 | 10 | 3 | 8 | | 8 | 3 | 0 | | 0 | 0 | 8 | 18 | 9 | 7 | 7 | 2 | 5 | 3 | 2.67 | 2.67 | 1.67 |
| 48 | 21Q65A0244 | 10 | | 10 | 3 | 8 | | 8 | 3 | 0 | | 0 | 0 | 8 | 18 | 9 | 8 | 8 | 3 | 4 | 3 | 3.00 | 3.00 | 2.00 |
| 49 | 21Q65A0245 | 10 | 4 | 10 | 3 | 9 | | 9 | 3 | 0 | | 0 | 0 | 9 | 19 | 10 | 7 | 7 | 2 | 5 | 3 | 2.67 | 2.67 | 1.67 |

| Attainment Level Summary | CO3 | CO4 | CO5 |
|---|---|---|---|
| Maximum Attainment Level | 3 | 3 | 3 |
| Cut-off Attainment Level(60%) | 1.8 | 1.8 | 1.8 |
| No.of Student >=Cut-off | 46 | 46 | 28 |
| % of students >=cut-off | 94 | 94 | 57 |
| Level Attained | 3 | 3 | 1 |
| **Level of Attained** | | | |
| **% of students** | <60 | 60-79 | >=80 |
| **Level** | 1 | 2 | 3 |

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| Department: | EEE | | |
|---|---|---|---|
| Course Outcome Attainment External Examination | | | |
| Name of the Faculty: | M.Ragini | | |
| Course&Branch | B.TECH, EEE | Exam: | EXTERNAL |
| Subject | ELECTRICAL AND HYBRID VEHICLES | Year/Semister: | IV-1 |

| S.NO. | HALLTICKET NO | TOTAL(Max. Score Marks) |
|---|---|---|
| 1 | 20Q61A0201 | 27 |
| 2 | 20Q61A0202 | -1 |
| 3 | 20Q61A0204 | -1 |
| 4 | 20Q61A0205 | -1 |
| 5 | 20Q61A0206 | 15 |
| 6 | 20Q61A0207 | 34 |
| 7 | 20Q61A0208 | 1 |
| 8 | 20Q61A0209 | 32 |
| 9 | 21Q65A0201 | 27 |
| 10 | 21Q65A0202 | 46 |
| 11 | 21Q65A0203 | 31 |
| 12 | 21Q65A0204 | 27 |
| 13 | 21Q65A0205 | 38 |
| 14 | 21Q65A0207 | 7 |
| 15 | 21Q65A0208 | 29 |
| 16 | 21Q65A0209 | 34 |
| 17 | 21Q65A0210 | 37 |
| 18 | 21Q65A0211 | 26 |
| 19 | 21Q65A0212 | 35 |
| 20 | 21Q65A0213 | 37 |
| 21 | 21Q65A0214 | 14 |
| 22 | 21Q65A0215 | 29 |
| 23 | 21Q65A0216 | 35 |
| 24 | 21Q65A0218 | 26 |
| 25 | 21Q65A0219 | 31 |
| 26 | 21Q65A0220 | 47 |
| 27 | 21Q65A0221 | 26 |
| 28 | 21Q65A0222 | 34 |
| 29 | 21Q65A0223 | 42 |
| 30 | 21Q65A0224 | 32 |
| 31 | 21Q65A0225 | 38 |
| 32 | 21Q65A0226 | 47 |
| 33 | 21Q65A0227 | 36 |
| 34 | 21Q65A0228 | 26 |

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|---|---|---|
| 35 | 21Q65A0229 | 37 |
| 36 | 21Q65A0230 | 20 |
| 37 | 21Q65A0231 | 28 |
| 38 | 21Q65A0232 | 16 |
| 39 | 21Q65A0233 | 20 |
| 40 | 21Q65A0235 | 39 |
| 41 | 21Q65A0236 | 20 |
| 42 | 21Q65A0237 | 34 |
| 43 | 21Q65A0238 | 32 |
| 44 | 21Q65A0239 | 39 |
| 45 | 21Q65A0240 | 37 |
| 46 | 21Q65A0242 | 41 |
| 47 | 21Q65A0243 | 38 |
| 48 | 21Q65A0244 | 26 |
| 49 | 21Q65A0245 | 44 |

| **Attainment level summary** | **CO1 to CO5** |
|---|---|
| Max.attainnment level | 3 |
| No. of students who attempted the subject | 46 |
| Max. Marks | 75 |
| Threshold 40% | 30 |
| No. of students who secured >= threshold value | 33 |
| Percentage of students secured >= threshold value | 71.7 |
| **level Attained** | 3 |

| **Attainment table** | |
|---|---|
| **50-60%** | **1** |
| **60-70%** | **2** |
| **70 above** | **3** |

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www.aietg.ac.in email: principal.avanthi@gmail.com

| Dept of EEE, Regulation:R18 , Subject:ELECTRICAL AND HYBRID VEHICLES Year & Sem: IV-I | | | | | |
|---|---|---|---|---|---|
| Faculty: M.Ragini Assistant Professor, Dept. of EEE | | | | | |
| Particulars | Overall Attainment | | | | |
| | CO1 | CO2 | CO3 | CO4 | CO5 |
| Internal Attaintment Level (INT) | 3 | 3 | 2 | 3 | 3 |
| External Attaintment Level (EXT) | 3 | 3 | 3 | 3 | 3 |
| TOTAL = INT * 0.25 + EXT * 0.75 | 3 | 3 | 2.75 | 3 | 3 |
| Target Level is 2.2(75%) | | | | | |
| | | | | | |
| Target =2.2 | | | | | |
| Observation: All COs are attained. | | | | | |

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**Dept of EEE, Regulation:R18 , Subject:ELECTRICAL AND HYBRID VEHICLES Year & Sem: IV-I**

**Faculty: k. Chandra Shekar Assistant Professor, Dept. of EEE**

**The Mapping of CO and PO on 3 point scale{high-3,Medium-2,Low-1} is:**

| | CO Attainment Level | PO-1 | PO-2 | PO-3 | PO-4 | PO-5 | PO-6 | PO-7 | PO-8 | PO-9 | PO-10 | PO-11 | PO-12 | PSO-1 | PSO-2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO-1 | 3 | 2 | 2 | 2 | 2 | | | | | | | | 3 | 2 | 2 |
| CO-2 | 3 | 2 | 2 | 2 | 2 | | | | | | | | 2 | 2 | 2 |
| CO-3 | 2.75 | 2 | 2 | 2 | 2 | | | | | | | | 2 | 2 | 2 |
| CO-4 | 3 | 2 | 2 | 2 | 3 | | | | | | | | 3 | 2 | 2 |
| CO-5 | 3 | 2 | 2 | 2 | 3 | | | | | | | | 3 | 2 | 2 |
| PO/PSO Weightage | | 10 | 10 | 10 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 10 | 10 |
| PO/PSO Co-relation weightage all Cos(1-5) | | 29.5 | 29.5 | 29.5 | 35.5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 38.5 | 29.5 | 29.5 |
| PO/PSO Attainment Level | | 3 | 3 | 3 | 3 | - | - | - | - | - | - | 2.2 | 3 | 3 | 3 |

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**Step: 3**

## Steps for preparation of CO-PO attainment

The assessment of course outcome is done based on examinations conducted:

- Mid exam
- Laboratory exam
- Projects
- University examinations

The course outcome for all theory courses is assessed based on target criterion set

**Step1:**AIET collected the exam marks from Exam branch.
Internal – sample form andUniversity Exam – Sample form
are shown after the procedure.

**Step 2:** One Sample excel sheet was developed internally for assessments.

**Step 3:** Copied the exam results to the developed excel sheet & calculated assessment from 1st internal exam; 2nd internal exam and university. From assessment – average Mark, % average mark and CO attainments.

The assessment of course outcome is done based on examinations conducted

- Mid Exam
- Laboratory Exam
- Projects
- University Examinations

The Course outcome for all theory courses is assessed based on target criterion set.
The Weightages are given for Internal Examinations & University Examinations.Theoverall attainment of the course outcome is calculated by obtaining weighted average.

Projects Work & Laboratory courses of assessed through Rubrics. Performance indicators are described in Rubrics to assess the course outcomes.

**Step 4**: After filling in the details in the last step (P and P/N), assign the attainment level (3/2/1 according to (P/N) values) based on Direct Assessment 1, Direct Assessment 2, and Indirect Assessment.

Attainment level (3 if more than 80% of students achieved the target / 2 for >70% / 1 for>60%)

**Direct assessment 1**: refers to evaluation through internal assessments which majorly include Continuous Internal Assessments (CIA1/CIA2) in terms of Internal Assessment Tests, Lab Assignments, Home Assignments, Class/Assignment Tests, Presentations, quizzes, etc.

**Direct assessment 2**: refers to evaluation through End Semester Examination (ESE) **Indirect assessment**: refers to the exit feedback survey taken by students/faculty/employers. The exit feedback survey must be taken up before the end of the semester. The exit survey may be based on a marking scheme (1-3) for each CO.

## Sample1: Course Outcome exit survey for students

| | Course Outcome | LOW(1) | MODERATE(2) | HIGH(3) |
|---|---|---|---|---|
| CO1 | demonstrate the ability to Understand the models to describe hybrid vehicles and their performance . | - | -2 | 3 |
| CO2 | Describe the operation of hybrid vehicle.. | - | - | 3 |
| CO3 | Analyze the characteristics and performance of hybrid vehicles and different types of motors. | - | 2 | -3 |
| CO4 | Evaluate the torque developed and performance of dc motors. | - | 2 | - |
| CO5 | Analyze the speed control /testing methods of dc motors in hybrid vehicles | - | - | 3 |

## Sample 2: Course Contents exit survey for students

| Questions | LOW(1) | MODERATE(2) | HIGH(3) |
|---|---|---|---|
| Quality of the Course Content | - | - | 3 |
| Relevance of the textbook to this course | - | - | 3 |
| Were the lectures clear/well organized and presented at a reasonable pace? | - | 2 | - |
| Did the lectures stimulate you intellectually? | - | 2 | 3 |
| Are the assignment/lab experiment procedures clearly explained? | - | | 3 |

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**Sample3: Faculty/Employer Survey**

| Questions | LOW(1) | MODERATE(2) | HIGH(3) |
|---|---|---|---|
| Satisfaction with the caliber of the graduates | - | - | 3 |
| Courses are relevant to the organization's vision and mission | - | - | 3 |
| Satisfaction with the speed at which course content is being adapted to meet changing industrial needs | - | 2 | - |
| Relevant subject or discipline knowledge | - | 2 | - |
| Quality of employability skills and attributes? | - | - | 3 |
| The satisfaction that graduates are learning the right skills | | | 3 |

*Further steps to follow for the calculation of Course Outcome attainment (COA) level: Please refer to the first column in the table (in orange) for conventions used (A, B, C, D, and E) for each parameter to calculate COA.

A: Assign the attainment level (3 for>80%/2 for >70%/1 for>60%) for Direct Assessment 1, Direct Assessment 2, and Indirect Assessment.

B: Attainment based on internal assessment (CIA) = Average of [CIA1(a) and CIA2(b)] C: Direct CO Attainment Level (DA) =25% CIA + 75% End-Term (c)

D: Indirect CO Attainment Level (IA)

E: Finally, Course Outcome Attainment (COA) level = 80% of DA and 20% of IA

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| | CO Attainment Calculations | | | | | | |
|---|---|---|---|---|---|---|---|
| | | Direct assessment | | | | | |
| | | DirectAssessment1(CIA) | | Direct Assessment 2 (ESE) | | Indirect Assessment Students/Allumni/Employer | |
| | | CIA1 | CIA2 | ESE | | Course Exit Survey | |
| | Number of students who have scored more than target (P) | 46 | | 36 | | | 22 |
| | Percentage of students who have achieved the target =(P/N)*100 | 85.29 | | 70.5 | | | 100 |
| A | **Attainment Level** **(3 for>80%, 2 for>70%, 1 for>60%)** | A=3 | | 3 | | d= | 3 |
| B | **Attainment based on internal assessment(CIA)** | | CIA = | 3 | | | |
| C | **Direct CO Attainment Level (DA)=25%CIA+75%End-Term(C);** | | DA = | 2.25 | | =0.25*3+0.75*3 | |
| D | **Indirect CO Attainment Level(IA) (based on Exit Survey(d));** | | IA = | 3 | | | |
| | | | **80 % of DA** = | 1.8 | | | |
| | | | **20% IA** = | 0.6 | | | |
| E | **CO Attainment Level (COA) =80%DA+ 20%IA;** | | COA = | 2.4 | | | |

**step:6** Based on the Course Objectives Attainment (COA) value as calculated at the end of step 5, perform the PO/PSO Attainment Calculations as shown below

**PO/PSOAttainment=COAxM/3(RefertoStep5forCOA value)**

**=2.4*2.2/3**

| CO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO(AVG)-M | 2.75 | 3 | 2.7 | 2.7 | 2 | | | | | | | 3 | 2 | 2 |
| PO/PSO | 2.95 | 2.92 | 2.91 | 2.91 | 3.00 | | | | | | | 2.95 | 2.92 | 2.92 |

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