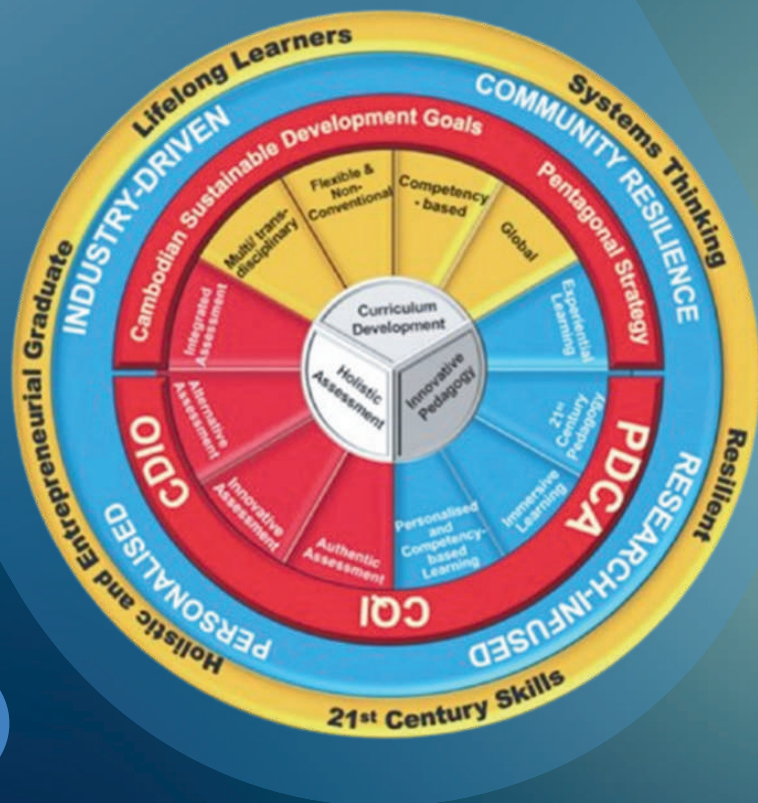




MINISTRY OF EDUCATION, YOUTH AND SPORT



PLAYBOOK ON HOLISTIC ASSESSMENT

DIRECTORATE GENERAL OF HIGHER EDUCATION

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Playbook on Holistic Assessment

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Foreword



His Excellency Academician
Dr. HANG CHUON NARON
Deputy Prime Minister, Minister
Ministry of Education, Youth and Sport

To support the implementation of the FutureFit Educational Framework for Outcome-Based Education in Cambodian higher education and its three guidelines for academic programme development to produce graduates equipped with the knowledge, skills, and attributes needed to meet future challenges in a changing world, the Ministry of Education, Youth and Sport (MoEYS) is pleased to present the Playbook on Holistic Assessment. This playbook is designed to support higher education institutions, especially instructors, in strengthening assessment practices that enhance student learning and competency development in Cambodia.

As our higher education system continues to advance toward Outcome-Based Education, the Playbook on Holistic Assessment has been developed to promote more effective assessment practices that evaluate student learning and ensure graduates possess sufficient knowledge, skills, and attitudes to face future challenges. The Playbook on Holistic assessment is a valuable reference for promoting meaningful student learning, continuous quality improvement, and excellence in assessment practices.

MoEYS looks forward to further improving the quality of higher education and developing future graduates who will actively contribute to the sustainable development of Cambodia.

I would like to express my sincere appreciation to the experts and technical team for their expertise, dedication, and commitment to the development of this Playbook. Their collaboration reflects a shared and ongoing commitment to improving the quality and relevance of higher education in Cambodia.



His Excellency

Dr. SANN VATHANA

Secretary of State

Ministry of Education, Youth and Sport

Higher education plays a crucial role in advancing a country's social, cultural, and economic development through the cultivation of human capital. In today's rapidly changing world, students may face unprecedented challenges in the future. Therefore, higher education institutions must prepare and produce graduates equipped with the knowledge, skills, innovative ideas, and professional competencies needed to meet the demands of society and the labour market.

The Playbook on Holistic Assessment has been designed to support higher education institutions in strengthening assessment practices aligned with outcome-based education and the evolving demands of the 21st century. As Cambodia continues to enhance the quality of higher education, assessment plays a critical role in ensuring that graduates not only acquire knowledge but also develop knowledge, skills, and attitudes for lifelong learning and employability.

I hope this Playbook will serve as a valuable resource and be effectively implemented by Cambodian higher education institutions, especially instructors, to collectively improve the quality of teaching and learning, and assessment across diverse disciplines. By embracing holistic assessment practices, we can better nurture our students to become future-ready graduates for the nation.

I would like to congratulate and express my sincere appreciation to the experts and technical team for their expertise, dedication, and commitment to the development of this Playbook. Their collective efforts reflect a shared dedication and commitment to advancing the quality and relevance of higher education in Cambodia.



His Excellency

MAK NGOY

Director General

**Directorate General of Higher Education,
Ministry of Education, Youth and Sport**

Assessment is an essential component of quality teaching and learning in higher education. In today's rapidly changing educational landscape, assessment is becoming increasingly important in moving beyond conventional paper-based examinations and embracing more holistic approaches that effectively measure students' competencies in real-world contexts, including knowledge, practical skills, and attitudes.

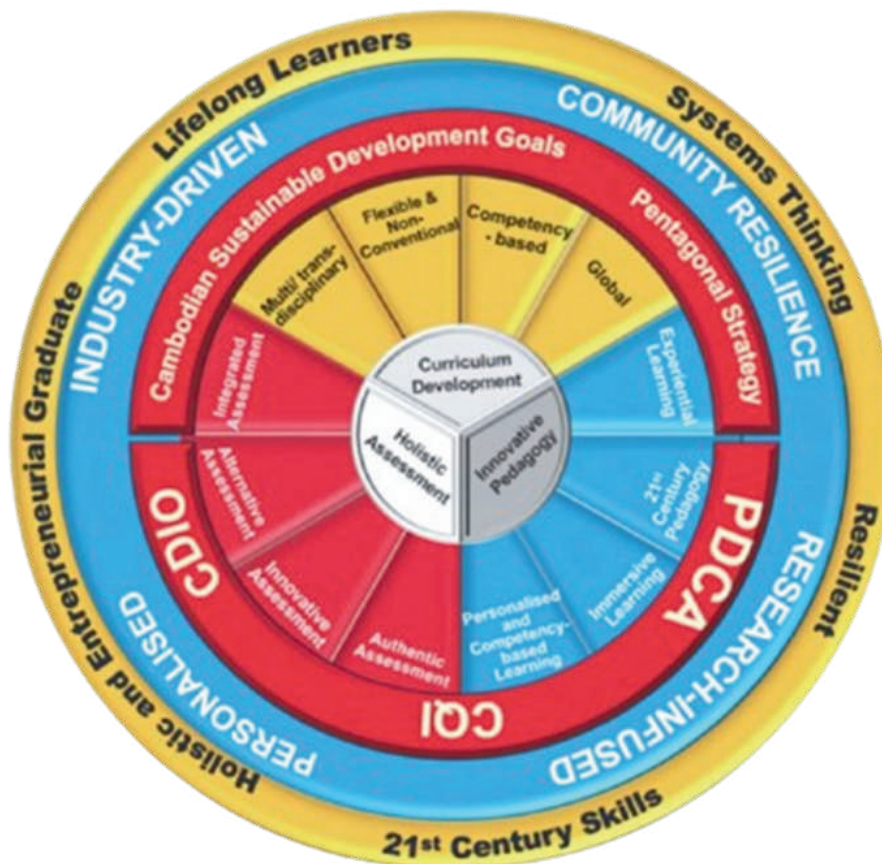
This Playbook on Holistic Assessment has been developed as a practical guide to support instructors and Cambodian higher education institutions in strengthening assessment practices aligned with outcome-based education, improving student learning, and creating a brighter future for our graduates.

This Playbook provides practical guidance for programme heads, instructors, curriculum developers, and higher education practitioners in designing and implementing effective assessment practices that ensure validity, reliability, fairness, and alignment with intended learning outcomes and support student success and lifelong learning. The Playbook promotes a balanced and comprehensive approach to assessing cognitive, psychomotor, and affective learning domains.

I would like to congratulate the technical team and express my sincere appreciation to the experts and technical team who contributed their expertise, knowledge, experience, dedication, and commitment to the development of this Playbook. Their collective efforts reflect a shared dedication and strong commitment to advancing educational quality and fostering continuous improvement in Cambodian higher education.

1

INTRODUCTION



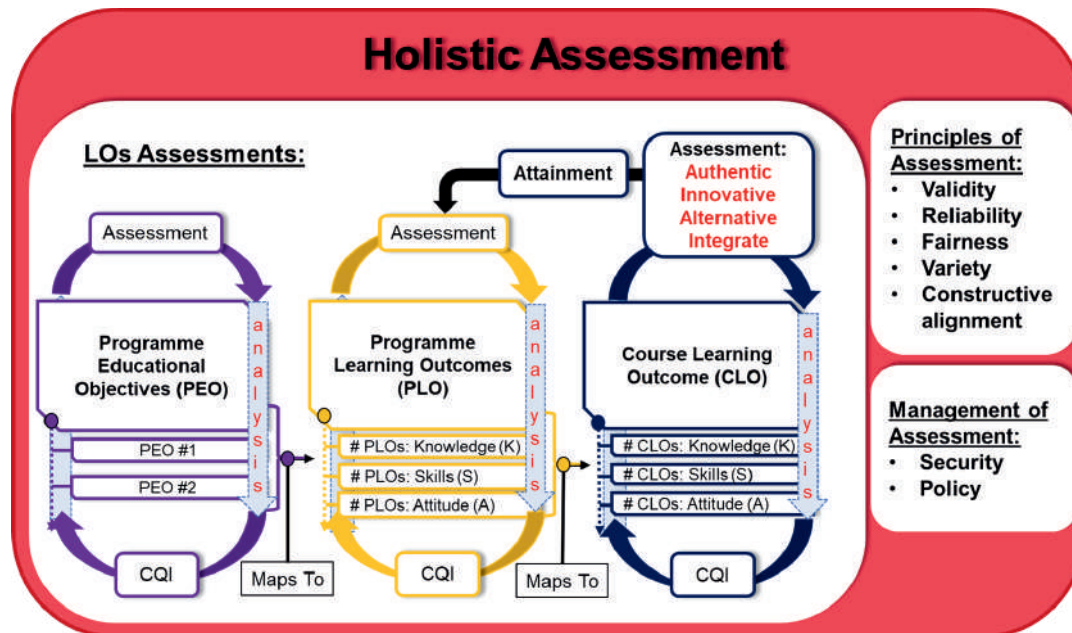
**FutureFit Educational Framework
for Outcome-Based Education in
Cambodian Higher Education**

FutureFit Educational Frameworks (FEF) is developed to align with Outcome-Based Education (OBE) principles to modernize curriculum design, teaching and learning delivery, and assessment of students' learning. The goal is to prepare graduates with sufficient knowledge, skills, and attitudes for the future challenges. FEF bridges the transformative curriculum with innovative pedagogy and holistic assessment.

Holistic Assessment is highlighted as a comprehensive approach for evaluating students' knowledge, skills, and attitudes through course learning outcomes (CLOs). It includes:

- Assessment approach: Authentic, Innovative, Alternative, and Integrated.
- Key principles of assessment: validity, reliability, fairness, variety, and constructive alignment.
- Management of assessment which focuses on security and policy.

The playbook aims to guide higher education institutions (HEIs) and instructors in improving student outcome assessments, covering CLO evaluation, assessment management, and contributing to overarching programme learning outcomes (PLOs). Various assessment techniques are utilized to assess learning outcomes with consideration to integrate holistic approach to make assessment holistic.



Overview of Holistic Assessment Process.

HOW TO USE THIS PLAYBOOK?

The playbook is a comprehensive guide for instructors to effectively implement holistic assessment. The playbook is a supplement and is to be read together with the Guideline on Holistic Assessment (GHA). It covers the introduction to holistic assessment, core principles of assessment, and practical assessment techniques. It also highlights the use of digital tools, the importance of constructive feedback, and methods to measure and achieve CLOs and PLOs. The playbook also includes strategies for continuous quality improvement (CQI) to ensure assessments evolve and maintain high programme quality. This resource equips instructors with the tools needed for comprehensive and effective assessment practices.

WHY

Helps instructors to choose appropriate assessment techniques and design tasks for comprehensive learning assessment, ensuring Course Learning Outcomes (CLOs) and Program Learning Outcomes (PLOs) are met.

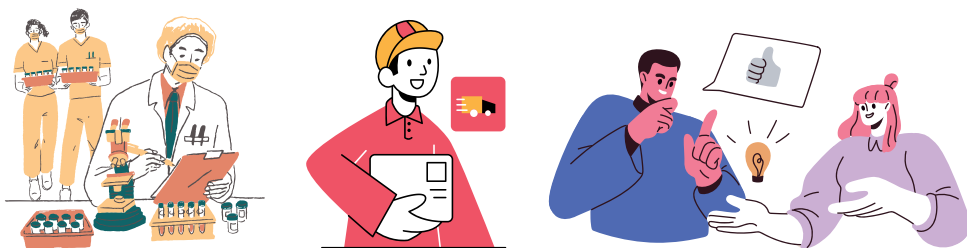
WHAT

Is a practical guide for instructors to assess student learning outcomes.

HOW

Is designed for quick reference, making it user-friendly for instructors to apply in educational settings.

2 CONCEPT OF HOLISTIC ASSESSMENT



A comprehensive approach used to evaluate students' knowledge (K), skills (S), and attitudes (A) in relation to each course learning outcome (CLO).

**KEY
ASPECTS IN
HOLISTIC
ASSESSMENT**



Competency

Ensuring students' learning competency, skill mastery, and attitude development.



Feedback

Providing students with meaningful insights with timely manner for their development.



Marking

Assessing students in a way that reflects their full capabilities with appropriate assessment tools.



Constructive Alignment

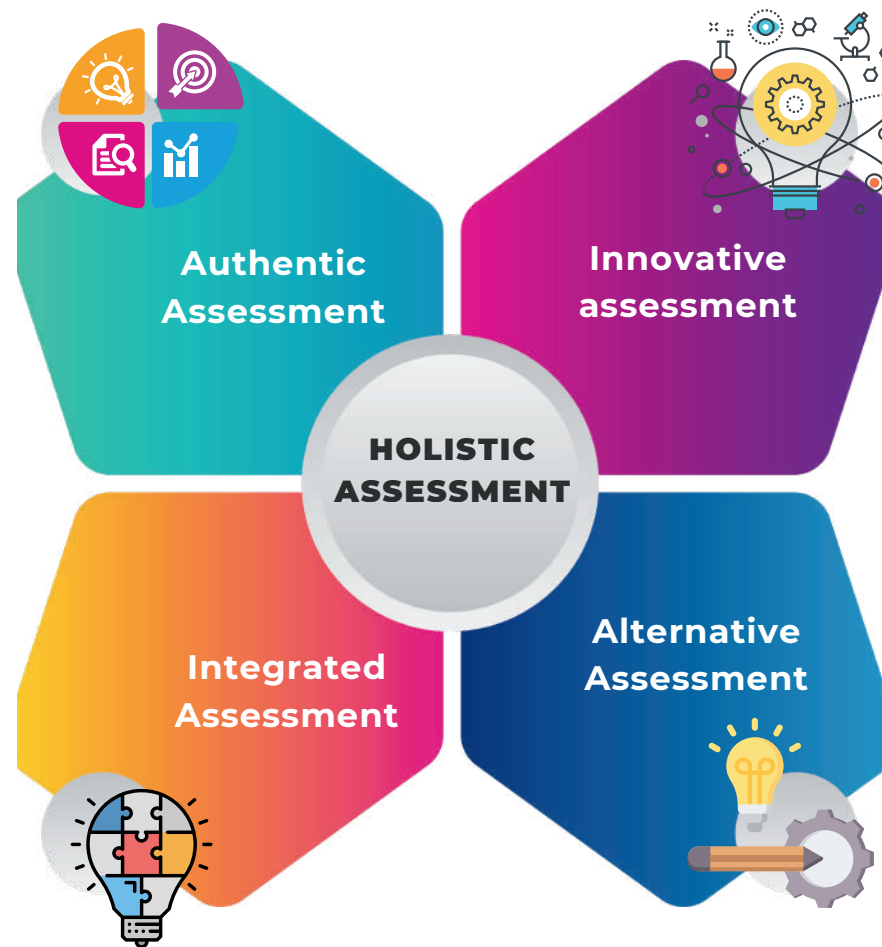
Planning assessment to ensure constructive alignment between learning outcomes, assessment methods and teaching activities.

Why do we need Holistic Assessment?



To measure and evaluate the learning outcomes that the course intends to achieve in terms of students' knowledge, skills and attitudes.

“ There are four approaches of holistic assessment that instructors need to focus on when they conduct assessment of students’ learning outcomes. ”



“ There is a variety of assessment approaches to assess students’ knowledge, skills and attitudes (KSA). ”

CONCEPT OF HOLISTIC ASSESSMENT



Authentic Assessment

- **Focus:** Utilizes *real-world tasks* and *scenarios* to assess student learning.
- **Purpose:** Measures students' ability to apply *knowledge, skills, and attitudes* in practical situations that students can apply or demonstrate their competency in a real scenario setting.



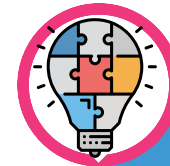
Innovative Assessment

- **Focus:** Technology integration to create students' engagement in learning and assessment to prepare students for the digital age.
- **Purpose:** Introduces new tools, technologies, and approaches to assess student's *knowledge area, skills, or attitude to make it more innovative in assessment.*



Alternative Assessment

- **Focus:** Uses *non-traditional methods* such as portfolios, projects, presentations, and self-assessments to measure higher level thinking and problem-solving skills.
- **Purpose:** Offers diverse, student-centered ways to evaluate *knowledge areas, skills, or attitudes* moving away from standard exams and tests.



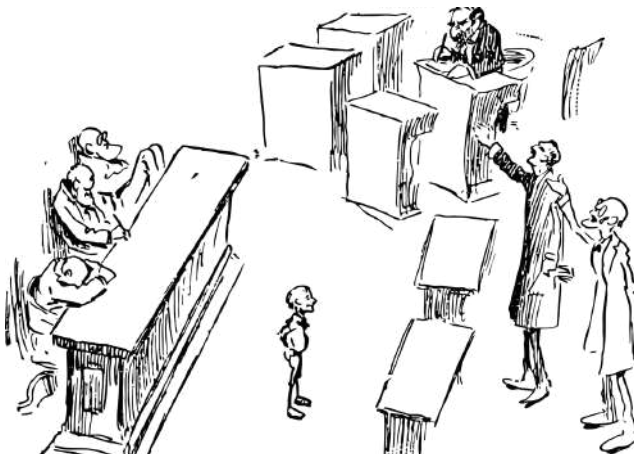
Integrated Assessment

- **Focus:** Combines *multiple learning outcomes, knowledge areas, skills or attitude* into a single assessment task.
- **Purpose:** Evaluates how well learners can apply a range of *knowledge, skill, or attitude* in a cohesive and interconnected way.

"Holistic assessment integrates key elements in each course and ensures all competencies are comprehensively covered across the entire programme."

EXAMPLE 2.1: AUTHENTIC ASSESSMENT

In the **Entrepreneurship** class, students need to **create network** with some local **small medium enterprise (SME)** partners that the instructor has identified. They **analyse the needs of the SMEs, develop a business plan** and **present it to a panel** of SME partners for feedback.



For a **history** course, students are required to **participate in a simulation** of a historical event, such as a mock Constitutional Convention, where they **debate and draft amendments** based on their assigned roles as historical figures.



EXAMPLE 2.2: INNOVATIVE ASSESSMENT

In a practical lesson, instructors assign tasks to students to **conduct experiments in the lab**. Instructors may not be able to be in the lab to see the real practice to check and evaluate students' work. In this case, instructors can **integrate innovation to assess students** at anytime and anywhere. Students need to **upload the result** file created by **software/technology after the completion** of experiments.



EXAMPLE 2.3: ALTERNATIVE ASSESSMENT

Students **conduct fieldwork** by visiting a local wetland, **collecting data** on plant and animal species, and **writing a report** on their findings.



EXAMPLE 2.4: ALTERNATIVE ASSESSMENT

In an engineering course, students **design and build a prototype** of an innovative product and **present their project to a panel** of industry experts.

EXAMPLE 2.5: INTEGRATED ASSESSMENT



Students are required to research on urban planning and the implications of sustainable living and to produce a report based on several relevant disciplinary perspectives. This task assists students in **finding, translating and paraphrasing multiple disciplinary perspectives**. Through this task, students **apply skills across disciplinary** contexts.

Conducting a capstone project which is a comprehensive project that require students to **synthesise and apply learning** from an entire programme. Students are asked **to create a comprehensive business plan** for a **new start up**, including **market research, financial projections, marketing strategies**, and **operational plans**.





“ **All FOUR** approaches of holistic assessment are authentic in nature because of the engagement in real context or scenarios.

However, the nature of each assessment in terms of the tasks, tools, or discipline, allows for classifications into four distinct but overlapping methods of holistic assessment. ”



PRINCIPLES OF HOLISTIC ASSESSMENT

3

Assessment is an important tool to measure the efforts of students during the learning process. Within this tool, instructors can observe students' abilities. To guarantee the effectiveness and consistency of the assessment, the process of assessment must follow the **PRINCIPLES OF ASSESSMENT** to ensure the alignment of learning outcomes and what are to be measured.

Validity



Reliability



Fairness



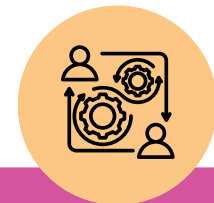
Equity



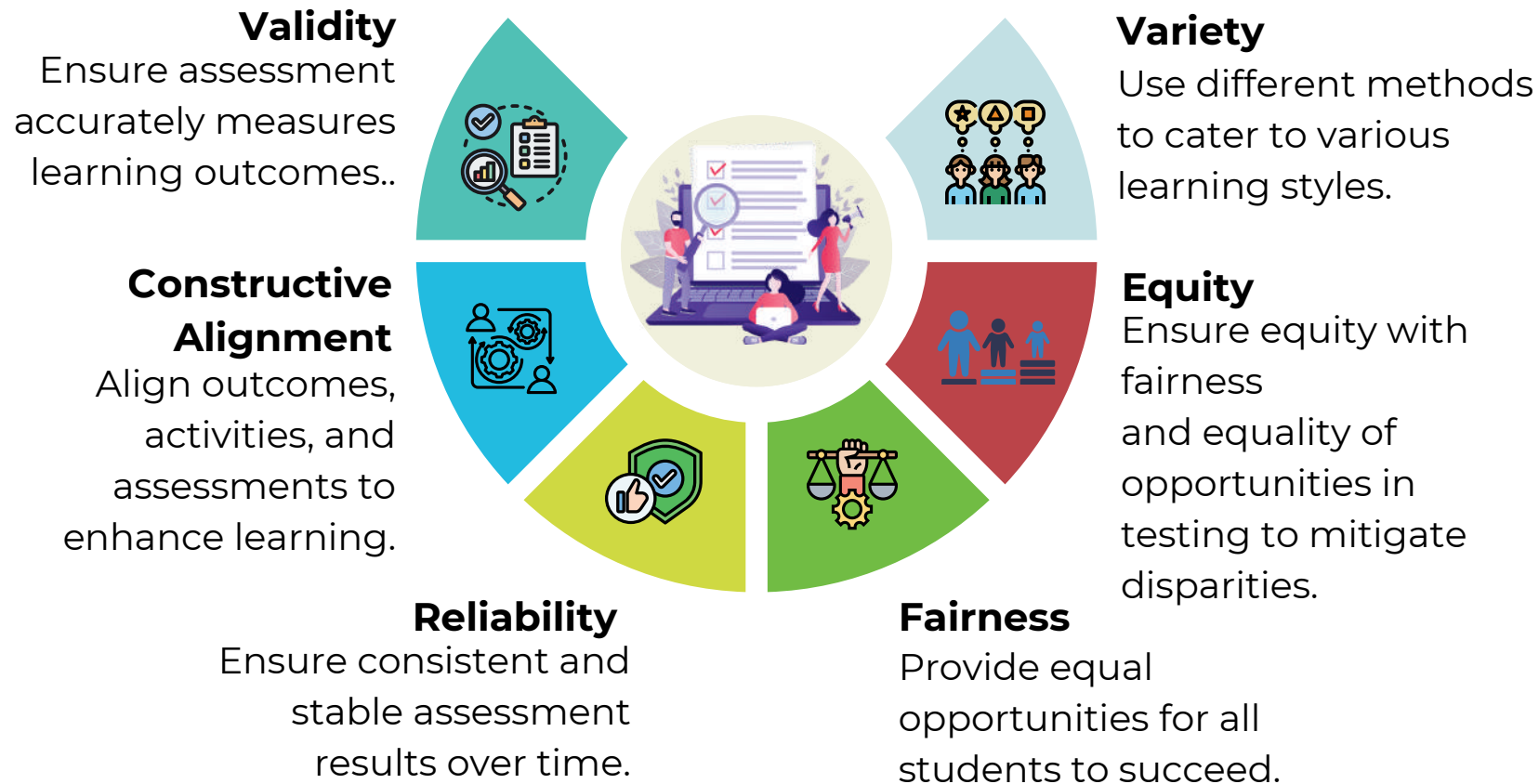
Variety



**Constructive
Alignment**



PRINCIPLES OF ASSESSMENT



" Ensure these principles are carefully considered to design assessments that are fair, reliable, valid, inclusive, and aligned with learning outcomes for a high-quality educational experience. "

VALIDITY



There are several types of validity that are used in assessment and research. This assessment playbook focuses only on content and construct validity that are more relevant considerations in developing course assessments.

CONTENT VALIDITY

Ensures the assessment fully covers the intended outcomes, reflecting the CLOs.

CONSTRUCT VALIDITY

Measures how well an assessment captures the theoretical construct it aims to evaluate.

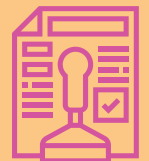
How to determine content validity?

- Align assessment tasks with CLOs, covering all relevant areas.
- Develop a Course Assessment Plan (CAP) for structured alignment.
- Use a Table of Test Specifications (ToS) to ensure balanced content coverage.
- Engage experts to review the assessment to ensure comprehensive content representation.



How to determine construct validity?

- Design tasks that reflect specific skills related to learning outcomes.
- Use varied methods (e.g., practical tasks, case studies) to measure complex constructs.
- Ensure consistency by aligning the assessment with related evaluations.



EXAMPLE 3.1 : CONTENT VALIDITY



CLO1 statement in Power Electronics Course

At the end of the course, students are able to select the power electronics components and structures for suitable purposes.



Ensure Content Validity

To ensure content validity for this CLO, the instructor needs to:

- Develop a course assessment plan (CAP) that consists of the information about assessment methods aligned with the CLO and the topics.
- Design a Table of Specification (ToS) which detail out the topics to cover, test duration, CLO mapping, and cognitive levels of the questions.

Course Assessment Plan (CAP):

CLOs	Assessment Techniques	Weightage (%)	Topics			SLT* (h)
			1	2	3	
1	Class Test 1	5%	√			60
	Class Test 2	5%		√		
	Midterm Exam	20%	√	√		
	Final Exam	20%		√	√	

*STL: Student Learning Time

Table of Specifications (ToS):

Week	Topics	Assess. Technique	Cognitive Level		# Q	Weight	Total Score
			C1	C6			
6	Rectifier Circuit	Online Quiz 1 (Multiple choice)	1	...	5	Q1-Q5 = 1 point each	5 points
7		Midterm (Written Exam)	1	1	5	Q1 = 2 points, Q2-Q3 = 4	20 points

*LD: Learning Domain

EXAMPLE 3.2 : CONTENT VALIDITY



CLO3 statement in Analog Electronics Course

Students are able to **develop** effective communication skills for electronics field in **scientific and non-scientific communities**.



Ensure Content Validity

To ensure content validity for this CLO, the instructor needs to:

- Develop a course assessment plan (CAP) that consists of information about assessment methods aligned with the CLO and with the topics.
- Design a rubric that places a greater emphasis on communication skills, such as delivery, time management, and audience engagement, by assigning higher scores to these criteria compared to technical skills.

Course Assessment Plan (CAP)

CL Os		Assessment Techniques	Weigh tage (%)	Topics			SLT* (h)
				1	2	3	
3	...	Presentation	10%	√	√	√	9
		Poster Presentation	10%		√		

*STL: Student Learning Time

Rubrics

Criteria	Weight	Excellent (4)		Need Improve (1)
Content	40%	Comprehensive, accurate, and well-organized	...	Limited understanding or irrelevant information
Delivery	30%	Clear, confident, and engaging		Unclear or monotone presentation style
Engage-ment	15%	Fully interactive and handles questions well		Lacks interaction, unable to respond to questions
Time manage-ment	15%	Perfectly timed presentation		Poor time management

EXAMPLE 3.3: CONSTRUCT VALIDITY



CLO1 statement in Power Electronics Course

At the end of the course, students are able to select the power electronics components and structures for suitable purposes.



Ensure Construct Validity

To ensure construct validity in this course, the instructor should:

- assess CLO1 using quizzes/test such as multiple choice, short answer question, application question, and exercise (see example of Class Test 1).

Example Quiz for the CLO1

Institute of Technology of Cambodia

Department of Electrical Engineering

Class Test 1: Rectifier Circuit

Duration: 30 min

Instructions:

- Answer all questions.
- Multiple-choice questions have one correct answer.
- Calculator is not allowed.

1. (1 point) What is the primary function of a rectifier?
 - a) To convert AC to DC
 - b) To amplify signals
 - c) To generate AC
 - d) To store energy
2. (1 point) Which component is essential in a half-wave rectifier?
 - a) Inductor
 - b) Diode
 - c) Transformer
 - d) Resistor
3. (1 point) Explain how the efficiency of a full-wave rectifier compares to that of a half-wave rectifier.
4. (1 point) Design a circuit diagram of a bridge rectifier. Label all essential components.
5. (1 point) Create a rectifier circuit that converts a 12V AC input to DC. Provide calculations for the ripple voltage and explain how you can reduce it.

EXAMPLE 3.4 : CONSTRUCT VALIDITY



CLO3 statement in Analog Electronics Course

Students are able to **develop** effective communication skills for electronics field in **scientific and non-scientific communities**.



Ensure Construct Validity

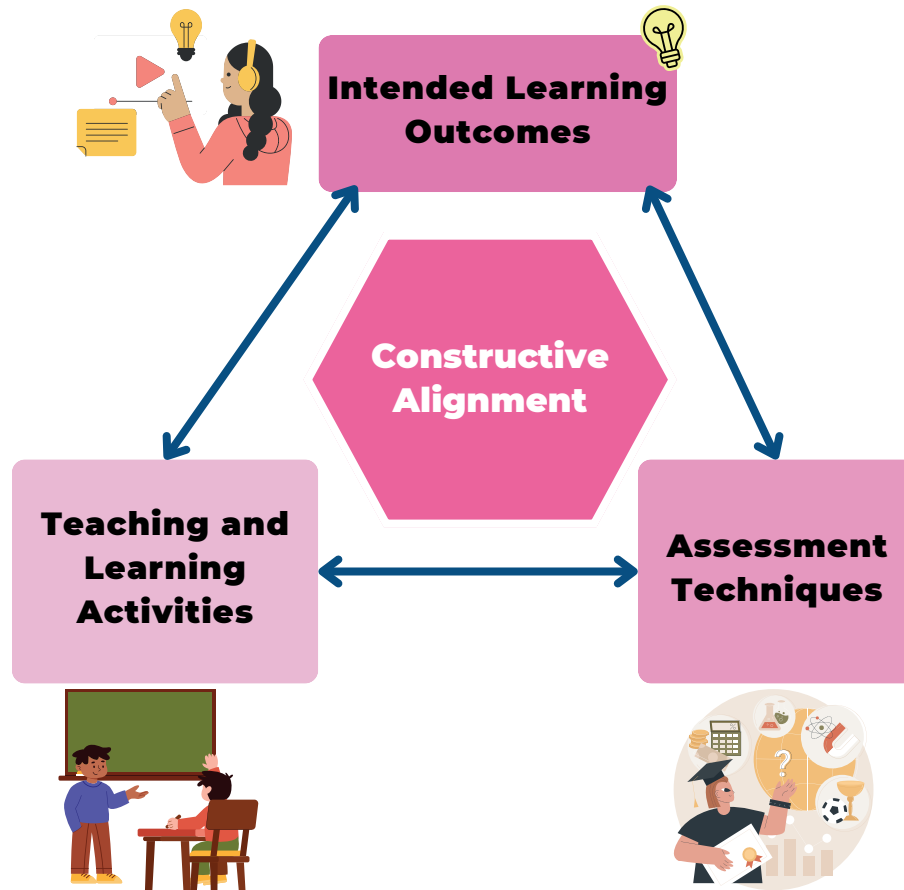
To ensure construct validity in this course, the instructor should assess CLO3 based on: Clarity of explanation (scientific and non-scientific contexts) for the presentation of the report.

Note: The content of the report is not assessed as part of CLO3 assessment since the focus is on communication skills.

Assessment Techniques	Assessment Tasks
Presentation and report	Do a presentation on a specific topic given to the class (scientific communication).
Poster Presentation	- Select a specific application of analog electronics and create a poster. - Present the poster in a public hall with different field audience (non-scientific communication).



CONSTRUCTIVE ALIGNMENT



Intended Learning Outcomes

- Define clear, measurable goals for what students should achieve.
- Use action verbs aligned with programme outcomes.



Teaching and Learning Activities

- Engage students with lectures, group work, and practical tasks.
- Focus on activities that directly support Intended Learning Outcomes.



Assessment Techniques

- Use diverse methods to measure Intended Learning Outcomes.
- Ensure alignment with outcomes and provide constructive feedback.

EXAMPLE 3.5: CONSTRUCTIVE ALIGNMENT

Course Title: Analog Electronics

Course Code: GEEI31AEL

No. of Credits: 1-1-1

CLO statement:

Build the common circuit experiment in Analog Electronics with technical explanation. (MD2 – LD2, C4; MD3 – LD3, P5)



Intended Learning Outcomes

- Build and explain a circuit.
- Assemble and test analog circuit.
- Follow procedures and document accurately.
- Explain circuit operation clearly.

T&L Activities



- Provide experiment paper, explain process.
- Perform the experiment; use tools effectively.
- Guide step-by-step document.
- Analyse results and explain.

Assessment Techniques



- **Oral test:** Explain circuit
- **Lab practical:** Observe hands-on skills.
- **Lab report:** Evaluate documentation quality.
- **Oral rest:** Assess technical explanation.

**SPECIAL
NOTE**

ENSURING VALIDITY AND ALIGNMENT OF ASSESSMENT TO COURSE LEARNING OUTCOMES

THREE documents must be developed to ensure the validity of the assessment and ensure the alignment between assessment to CLOs.



Course Assessment Plan (CAP) - Outlines the assessment strategies within a course, ensuring alignment with learning outcomes and facilitating meaningful student learning outcomes. May include key components such as topics, teaching learning activities, learning outcomes, assessment strategies, and the weighting of the assessments.

Detailed Course Syllabus (DCS) or Course Plan - Details work plan according to weeks in the semester. Must ensure the alignment between the outcomes, assessment and teaching and learning delivery.

Table of Test Specifications or Test Blueprint - Ensures that tests measure an adequate sampling of course contents, and the cognitive levels identified in the CLOs and were emphasized during instruction.

TIPS:

- These documents must be endorsed by course committee, Head of Department or Dean of Faculty.
- Each Higher Education Institution (HEI) is encouraged to have their own standardised guideline templates for these documents.

EXAMPLE 3.6: COURSE ASSESSMENT PLAN FOR AN ENGINEERING COURSE



This table is very important to check the achievement of CLO in a course.

CLOs	CLOs statement	PLOs	Assessment Techniques	Weightage (%)	T&L* Strategy/ Technique	Level of Learning (C/A/P*)	Topics			SLT** (h)
							1	2	3	
1	At the end of the course, students are able to select the power electronics components and structures for suitable purposes.	PLO1	Class Test 1	5%	Peer teaching	C4	√			60
			Class Test 2	5%				√		
			Midterm Exam	20%			√	√		
			Final Exam	20%				√	√	
2	At the end of the course, students are able Design a suitable and economical power electronics converter for requirement specification.	PLO2	Lab Prototype and report	10%	K-W-L	C6				30
		PLO3		15%		P7	√	√		
3	At the end of the course, students are able Develop effective communication skills of power electronics systems in scientific and non-scientific communities.	PLO8	Presentation and report	25%	PoBL	A4				30

*T&L: Teaching and Learning

**SLT: Student Learning Time

Note: Weightage of all assessments for each CLO should be proportionate to the SLT (time spent on the CLO during course implementation)

EXAMPLE 3.7: DETAILED COURSE SYLLABUS FOR AN ENGINEERING COURSE

Week	Hours (L/T/P*)	CLOs	Lesson Learning Outcomes	Topics	Teaching Activities	Learning Activities	Assessment Techniques	T&L Resources
1-3	3/6/6	CLO1 CLO2 CLO3	- Ability to demonstrate the working principle of diode - Ability to analyze the v-i curve of diode - Ability to solve the diode circuit problem - Ability to select the diode based on specific parameters - Ability to conduct experiment and conclude report of diode	Diode and Diode Circuit	- Discuss working principle of diode - Lecture on characteristics of diode - Provide examples of diode problem - Demonstrate the lab. experiment - Explain about the project based on module given	- Review provided document before class (Flipped-Class) - Complete specific exercises given - Prepare presentation for specific exercise given (Specific group of students) - Review Lab instruction before class - Check module provided	- Quiz (Flipped-class) - Presentation and Q&A - TD1 Correction - Lab1 & 2 Report	- Lecture note for Diode and Diode Circuit - TD1: Diode and Diode Circuit - Completed document on diode and diode circuit - Lab1: Diode characteristics - Lab2: Zener Diode and Voltage Regulator ...
...	.../.../...	...	...	...	...	...	...	...

EXAMPLE 3.8: TEST OF SPECIFICATION FOR AN ENGINEERING COURSE

Week	Topics	Learning Outcomes	Hours Spent	Assessment Techniques	Learning Domain (LD)	CLOs	Cognitive's Level						Question Number	Weighth	Total Score
							C1	C2	C3	C4	C5	C6			
6	AC-DC Rectifier	- Ability to compute the half- and full-wave rectifier with Diode and E5with Thyristor ...	30 min	Online Quiz 1 (Multiple choice)	LD1	CLO1	1	1	2	1			5	Q1-Q5 = 1 point each	5 points
7			2h	Midterm (Written Exam)	LD2		1	1	2	1			5	Q1 = 2 points, Q2-Q3 = 4 points, Q4-Q5 = 5 points	20 points
12	DC-DC Isolated ...	- Ability to compute the Buck, Boost, and Buck-Boost Converter ...	30 min	Online Quiz 2 (Multiple choice)	LD1		1	1	2	1			5	Q1-Q5 = 1 point each	5 points
							1	1		1					
17	DC Power Supply	- Ability to compute the Flyback, Forward, Push-Pull Converter, ...	2h	Final (Written Exam)	LD2		1	1		1			6	Q1-Q4 = 2 points, Q5-Q6 = 6 points	20 points
															50 points



RELIABILITY



Common Practice

To ensure reliability, instructor should:

- Include enough questions.
- Ensure appropriate test duration.
- Maintain a consistent environment.
- Provide clear instructions.
- Use a user-friendly exam format.
- Train human raters thoroughly.

Statistical Test

To check the reliable, instructor can use statistical test such as:

- **Test-Retest**
- **Internal Consistency**

Test-Retest

- Administer the same test to the same group at different times.
- Check for consistency in the results.
- High correlation between the scores indicates strong reliability.



Internal Consistency

- Measures correlation between items in a test assessing the same construct.
- Commonly evaluated using statistical methods such as Cronbach's alpha or split-half reliability.



EXAMPLE 3.9: CONDUCTING TEST-RETEST TO CHECK RELIABILITY

Course**Title:**

Analog
Electronics

Course**Code:**

GEEI31AEL

No. of Credits:

1-1-1

Test topic:

Diode and
diode
applications

Class:

I3GEE

Class size:

10 students

GEEI31AEL – Test on Diode and Diode Application

Q1. Draw the I-V characteristic curve of a silicon diode and label the forward bias, reverse bias, and breakdown regions.

Q2. Explain the difference between an ideal diode and a real diode in terms of their characteristics and behavior.

Q3. What is the function of a Zener diode, and how does it operate in reverse bias?

Q4. A diode is connected in series with a 1 k Ω resistor to a 10V DC power supply. Assume the diode has a forward voltage drop of 0.7V. Calculate the current flowing through the circuit.

Q5. In a half-wave rectifier with a peak AC input of 20V, calculate the peak output voltage assuming a silicon diode.

Q6. For a Zener diode voltage regulator circuit with a Zener voltage of 5.6V and a series resistor of 220 Ω , calculate the current through the Zener diode when the input voltage is 12V.

Q7. Design a circuit using a diode to allow current to flow only when the voltage is above 3V.

Q8. Explain how a diode can be used in a clipper circuit and draw a diagram to clip the voltage to +5V.

Q9. In a bridge rectifier circuit, explain why four diodes are used and describe the current path during the positive half-cycle of the input AC signal.

STEP 1

Create a diode
specific test

EXAMPLE 3.9: CONDUCTING TEST-RETEST TO CHECK RELIABILITY

Course Title: Analog Electronics

Course Code: GEEI31AEL

No. of Credits: 1-1-1

Test topic: Diode and diode applications

Class: I3GEE

Class size: 10 students

- Divide the test in two halves:
 - **1st Half** (Odd-Numbered Questions): Q1, Q3, Q5, Q7, Q9
 - **2nd Half** (Even-Numbered Questions): Q2, Q4, Q6, Q8
- Calculate each student's total score for **1st Half** and **2nd Half**

Results of each student for 1st Half and 2nd Half of the test:

Student	Score (1st Half)	Score (2nd Half)
Student 1	15	14
Student 2	13	12
Student 3	14	13
Student 4	12	11
Student 5	10	10
Student 6	16	15
Student 7	14	13
Student 8	13	12
Student 9	11	10
Student 10	12	11

STEP 2 Split the test

EXAMPLE 3.9: CONDUCTING TEST-RETEST TO CHECK RELIABILITY

Course Title: Analog Electronics
Course Code: GEEI31AEL
No. of Credits: 1-1-1
Test topic: Diode and diode applications
Class: I3GEE
Class size: 10 students

Formula: The formula for the Pearson Correlation Coefficient (r) is:

$$r = \frac{\sum((X - \bar{X})(Y - \bar{Y}))}{\sqrt{\sum(X - \bar{X})^2 \sum(Y - \bar{Y})^2}}$$

Where:

- X and Y are the scores for 1st Half and 2nd Half respectively,
- $\bar{X}$ and $\bar{Y}$ are the means of X and Y,
- Σ represents the summation symbol.

STEP 3

Analyze the correlation

- Use a statistical method (eg. Pearson's correlation coefficient) to measure the relationship between scores in **1st Half** and **2nd Half**

Student	1st Half (X)	2nd Half (Y)	(X - $\bar{X}$)	(Y - $\bar{Y}$)	(X - $\bar{X}$)(Y - $\bar{Y}$)	(X - $\bar{X}$) ²	(Y - $\bar{Y}$) ²
Student 1	15	14	2.00	1.90	3.80	4.00	3.61
Student 2	13	12	0.00	-0.10	-0.00	0.00	0.01
Student 3	14	13	1.00	0.90	0.90	1.00	0.81
Student 4	12	11	-1.00	-1.10	1.10	1.00	1.21
Student 5	10	10	-3.00	-2.10	6.30	9.00	4.41
Student 6	16	15	3.00	2.90	8.70	9.00	8.41
Student 7	14	13	1.00	0.90	0.90	1.00	0.81
Student 8	13	12	0.00	-0.10	-0.00	0.00	0.01
Student 9	11	10	-2.00	-2.10	4.20	4.00	4.41
Student 10	12	11	-1.00	-1.10	1.10	1.00	1.21

- Pearson Correlation Coefficient (r): **0.988**
- This indicates a very high correlation between the scores of the two halves of the test, showing that the **test is consistent**.



FAIRNESS

FAIRNESS is a fundamental principle to ensure equal opportunities and unbiased results for all test-takers and irrespective of their background or characteristics. It encompasses the accuracy of what the test is intended to measure (validity) and the consistency of the results (reliability) across different groups.

Example



During an exam, instructor ensures fairness by:

- **Providing a clear guideline:** Instructor shares the exam rules with all students beforehand to ensure every student is aware of the expectation of the test.
- **Equal time allocation:** All students are given the exact same time to complete the test.
- **Eliminating distractions:** Instructor arranges a quiet and comfortable room for the exam to minimize noise and distractions.
- **Accommodating special needs:** For students with disabilities, instructor provides extra time or other necessary accommodations as per institutional policies.

EQUITY



- Equity ensures assessments are inclusive of diverse perspectives, linguistic varieties, and appropriate accommodations.
- It aims to lead to fairness and positive outcomes for all students, recognizing that different individuals may need different resources and support to succeed.

Example



An instructor notices that some students struggle with traditional written exams due to language barriers or learning disabilities. To ensure all students are able to demonstrate their understanding, the instructor offers multiple assessment options, such as the following:

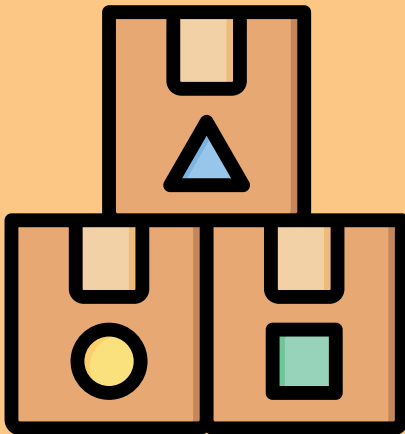
- **Oral presentation:** Allow students to explain concepts verbally.
- **Project-based assessment:** Enable students to apply their knowledge in practical scenarios.
- **Portfolio:** Compile a collection of work over time to show progress.



VARIETY

Variety in assessment involves using multiple methods to evaluate students' knowledge and skills, catering to their diverse learning styles, backgrounds, and abilities. This principle ensures a more comprehensive and fair evaluation of student learning.

Example

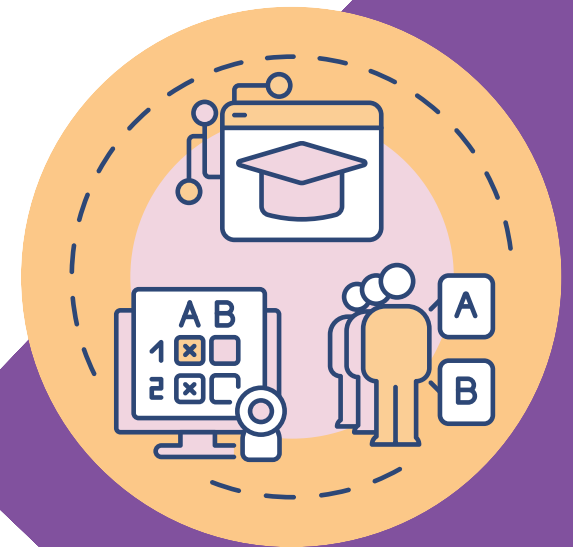


To ensure variety, multiple methods are used to assess students:

- **Practical Lab Projects:** Students design and build a power electronics circuit.
- **Oral Examinations:** Students explain concepts and answer questions verbally.
- **Written Reports:** Students do research and write about specific topics in power electronics.
- **Group Projects:** Team works together to solve complex problems or design systems.
- **Multimedia Presentations:** Students create videos or presentations to explain their projects.

What is Assessment?

Assessment is an ongoing process to improve students' learning by measuring what they have learnt (learning outcomes) through both formal and informal forms of assessment. Information collected and feedback are shared with students, so that they know how to improve their achievements.



ASSESSMENT TYPES

Formative vs. Summative



Formative

Ongoing and informal assessment method during the learning process to provide feedback and guide instruction.

Examples:

Quizzes
Observation
Class discussion
Peer assessments
Homework assignment

Summative

Evaluation of student learning at the end of a course, or program to determine their achievement.

Examples:

Final Exams
Final projects
Term paper
Standardized tests

Direct vs. Indirect



Direct

Involves directly observing or measuring student performance or behavior to assess specific skills or knowledge.

Examples:

Written exams
Practical tasks (Lab work, presentation)
Portfolio
Simulation

Indirect

Relies on self-reported or indirect measures of student learning or perception by gathering information about students' experiences, attitudes and perceptions.

Examples:

Survey
Questionnaire
Interviews
Focus group
Reflections or journals

Norm-referenced vs. Criterion-referenced



Norm-referenced

Compares individual student performance to a norm or average of a group.

Examples:

Standardized tests
Percentile rankings

Criterion-referenced

Determines whether students have achieved specific learning objectives or criteria set.

Examples:

Rubrics-based (Essay, project)
Proficiency scales
Skills checklists

Assessment Techniques



Assessment techniques refer to evaluation methods utilised by instructors to assess students' learning outcomes. There is a wide range of assessment techniques used to enhance student's learning and to ensure students are assessed across a range of abilities.

A range of assessment techniques is employed to assess learning outcomes, taking into account the integration of a comprehensive approach to ensure that the assessment is holistic. Instructors can use various assessment techniques to ensure a more comprehensive evaluation of students' learning outcomes, accommodating different learning styles and providing multiple avenues for students to demonstrate their knowledge and skills.



Examples of assessment techniques

Presentation

Interview

Standardised
written exam

Case study

Simulation or Role Play

Take-home
test/assignment

Journals and Reflective
Writing

Observation

Peer Assessment

Quizzes

Portfolio

Self-assessment

Project

Group Assessment

WHAT DO INSTRUCTORS NEED TO CONSIDER WHEN **DETERMINING ASSESSMENT TECHNIQUES** TO **ASSESS** LEARNING OUTCOMES?

- Intended learning outcomes
- Expected students' attributes



Links to Assessment techniques

Intended learning outcomes	Expected students' attributes	Assessment techniques
Think critically and make judgement	Development of arguments, reflection, judgement, evaluation	
Solve problems/develop plan	Identify problems, define problems, analyse data, review, design experiments, plan, apply information	
Perform procedures and demonstrate techniques	Take readings, use equipment, follow procedures and protocols	
Demonstrate knowledge and understanding	Recall, describe, report, identify, recognize, recount	
Manage/develop self-direct	Work cooperatively and independently, be self-directed, manage time and tasks	
Design, create, perform	Design, create, perform	
Assess and manage information	Information search, retrieval, investigate, interpret, evaluate information	
Communicate	Communicate through written, spoken and visual means	



**ASSESSMENT
TECHNIQUES** in
different
**LEARNING
DOMAINS** and
LEVELS

ALIGNMENT BETWEEN KSA AND LEARNING DOMAINS (MAJOR DOMAINS-MD AND LEARNING DOMAINS-LD)

Revised Bloom's Taxonomy		CQF Learning Domains	
Domain	Number of Levels	Major Domain (MD)	Learning Domain (LD)
Knowledge (Cognitive) (K)	6	MD1: Knowledge	LD1: Knowledge
		MD2: Cognitive skills	LD2: Cognitive skills
Psychomotor/ Technical Skills (S)	7	MD3: Psychomotor/ Technical skills	LD3: Psychomotor/Technical skills
Affective (Attitude) (A)	5	MD4: Interpersonal skills and responsibility	LD4: Interpersonal skills
			LD5: Responsibility
			LD6: Entrepreneurial skills
			LD7: Ethics and Professionalism
K/S/A*		MD5: Communication, information technology, and numerical skills	LD8: Communication*
			LD9: Information technology or digital skills*
			LD10: Numerical skills*

ASSESSMENT TECHNIQUES FOR COGNITIVE DOMAIN



Cognitive Domain

Six levels of knowledge to be acquired by students and to measure **THINKING Skills**.

Creating: Students can propose or suggest a new idea or product

Presentation, Essay, Journal, Report writing, Prototype or model, Composition, Performance tasks, Research based, Project work and Business plan.

C6

Evaluating: Students can make judgment the impact of the facts

Written test, Debates, Mock court, Essay, Experiment, Project work, Performance test and Case study

C5

Analysing: Students can apply theories to differentiate the facts

Essay writing, Written report, Portfolios, Debates, Case studies, SWOT analysis, Performance test, Project work, Presentation

C4

Applying: Students can use knowledge to solve problems

Performance (class activity, role play), Project work, Posters, Practicum/field work, Simulation, Case studies (real-life problem and proposed a solution) and Lab experiment.

C3

Understanding: Students can explain the facts using their own words.

MCQs, Short answer test (compare and contrast two or more theories, process), Presentation (interpreting or explaining information), Class discussion, Essay, Posters, Paraphrasing information and Writing test

C2

Remembering: Students only memorise the fact given.

Multiple choice questions (MCQs), Fill in the Blank questions, Labelling, Short answer question, Writing test, Performance test, Matching, Presentation (Summarising, Reciting and Puzzles

C1

Note:

The same assessment techniques may be applied across various levels; however, the complexity of the task determines the level of application.

EXAMPLE 4.1: ASSESSING A CLO WHICH EMPHASIZES ON SEVERAL LEARNING DOMAINS USING ONE TASK

Assessment task: A project to assess ability to create **(C6)**

CLO - At the end of the course, students can propose a project to implement a sustainable energy solution in a real-world context (MD1- C6, MD2, MD5 - LD8).

This project should be able to **assess** students' ability **to create a comprehensive proposal**. Apart from that, it can be used to **assess their research skills, critical thinking, collaboration**, and **presentation abilities**. It also provides an opportunity for students to apply theoretical knowledge to real-world problems and develop practical solutions.

Task description

Work in groups of threes. **Develop a proposal** for implementing a sustainable energy solution in a real-world context, such as a community, business, or campus. You need to research various sustainable energy sources, analyse their environmental impact, economic feasibility, and potential for widespread adoption.

Present the proposal using an appropriate presentation tool.

Note: The CLO focuses on MD1- C6, MD2, MD5 - LD8. Hence assessment should encompass the following criteria:

- i. Proposal that reflects the depth of research and understanding of sustainable energy concepts **(MD1 - C6 Creating) - 50%**
- ii. Clarity and coherence of the proposal, including feasibility and potential impact **(MD2 - Critical Thinking) – 30%**
- iii. Creativity, organization, and effectiveness of the presentation **(LD8 - Communication Skills) – 20%**

EXAMPLE 4.2: ASSESSING A CLO WHICH EMPHASIZES ON SEVERAL LEARNING DOMAINS USING ONE TASK

Intended Learning Outcome: Students will be able to analyse the factors affecting the quality of agricultural raw material during storage (MD2 – LD2, C4, LD8)

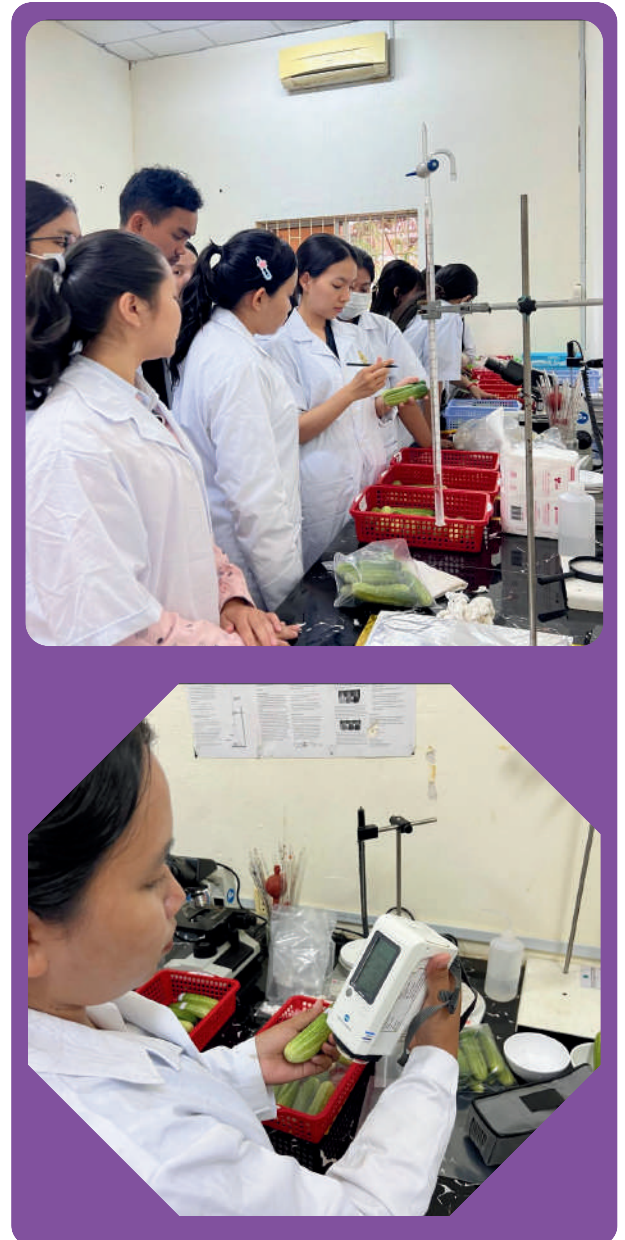
Assessment techniques and tasks: A laboratory report

Assessment Criteria

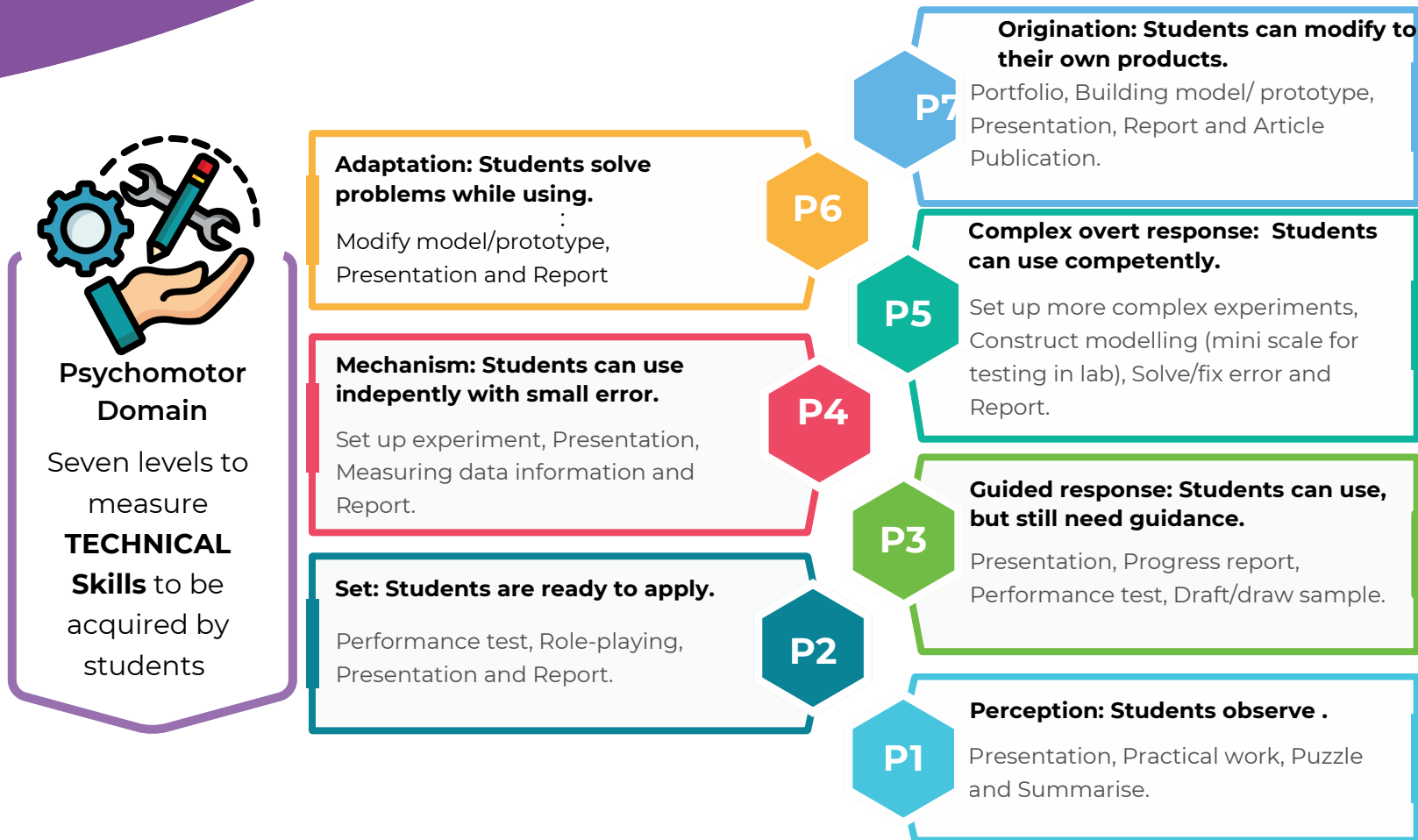
- Experimental Skills: Proper setup, handling of materials. (LD2)
- Data Accuracy: Completeness and reliability of collected data. (LD2)
- Critical Analysis: Ability to analyze factors affecting cucumber quality and draw evidence-based conclusions. (C4)
- Report Quality: Organization, clarity, and scientific rigor of the written lab report. (LD2)
- Presentation Skills: Clarity, engagement, and effectiveness in communicating findings. (LD8)

How to implement:

Students are asked to conduct experiment in laboratory on one type of vegetable (e.g. cucumber) through packaging in different packaging material and storage condition. Through the experiment, the student are asked to identify, analyze and discuss on the factors affecting the quality of cucumber during storage. The students prepare final lab report and presentation.



ASSESSMENT TECHNIQUES FOR PSYCHOMOTOR DOMAIN



Note:

The same assessment techniques can be applied across various levels; however, the complexity of the task determines the level of application.

EXAMPLE 4.3: ASSESSING A CLO WHICH EMPHASIZES ON SEVERAL LEARNING DOMAINS USING ONE TASK

Assessment task: To assess level of complex overt response (**P5**)

CLO - At the end of the course, students are able **to demonstrate** their ability **to apply knowledge** of crop management techniques, **use appropriate tools** and equipment, and **perform tasks** accurately and efficiently in crop planting and management (**MD2, MD3 - P5, MD4 - LD5**).

Task description

Form groups of four people. In the designated plot assigned to your group, **Prepare the land** for planting, including soil cultivation, leveling, and amendment as necessary

- **Plant a variety of crops** according to specified planting guidelines
- **Set up irrigation systems** to provide adequate water to planted crops
- **Apply fertilizers** as needed Implement measures to control pest and disease that affect the crops.

Note: The CLO focuses on MD2, MD3, and MD4 - LD5. Hence assessment should encompass the following criteria:

- i. Problem-Solving: The ability to identify and address challenges related to soil preparation, irrigation, fertilization, and pest management (MD2 - problem solving) – 30%
- ii. Technique Proficiency: The ability to perform crop planting and maintenance tasks accurately and efficiently (MD3 - psychomotor/technical skills - P5) – 50%
- iii. Team work: The ability to determine division of labour and work cooperatively in managing the farm (MD4 – LD5) – 20%

ASSESSMENT TECHNIQUES FOR AFFECTIVE DOMAIN



Affective Domain

Five levels to measure

ATTITUDE to be acquired by students in group work.

Organization: Students provide help and support to other members, apart of thier assigned tasks.

Project, Case study, Poster, Written exam, Debate and Prototype

A4

Responding : Students can work cooperatively in group works.

Project (group), Lab experiment, Presentation

A2

A5

Characterisation: Students are willing to do the group works.

Role play, Essay, Posters, Project, Presentation, Prototype, Performance Task, Journal and Research

A3

Valuing: Students can provide and justify their reasoning based on their personal values.

Long project, Case study, Written exam, and Presentation

A1

Receiving: Students can accepts the diversity of races and nationalities among group members and respect for others' ideas.

Quiz, MCQ, Puzzle, Face to face oral, Summary report, Written exam and Project

Note:

The same assessmt techniques can be applied across various levels; however, the complexity of the task determines the level of application.

EXAMPLE 4.4: ASSESSING A CLO WHICH EMPHASIZES ON SEVERAL LEARNING DOMAINS USING ONE TASK

Assessment task: A project to assess level of internalising **(A5)**

CLO - At the end of the course, students are able **to defend ethical implications** of engineering decisions **(MD2, A5 - LD7, LD8)**.

Task description

In groups of threes, **conduct a case study** analysis focusing on ethical dilemmas and moral reasoning in engineering practices. You are required to critically evaluate case scenarios, consider the ethical implications of engineering decisions, reflect on their personal values and ethical principles, and articulate the perspectives and justifications in written or oral presentations.

Note: The CLO focuses on MD2, A5 - LD7, and LD8. Hence assessment should encompass the following criteria:

- i. Ethical Analysis: The depth and rigor of students' ethical analysis of case scenarios, including identification of ethical issues, application of ethical principles, and consideration of consequences (MD2 - analytical thinking - 30%
- ii. Justification and Argumentation: The clarity, coherence, and persuasiveness of students' ethical reasoning and justification for their proposed courses of action. (MD2 - reasoning) - 20%
- iii. Reflection and Self-Awareness: The depth and insightfulness of students' reflections on their personal values, beliefs, and ethical responsibilities as future engineers. (LD7 - ethics and professionalism) - 30%
- iv. Communication Skills: The effectiveness of students' written or oral presentations in conveying their ethical perspectives and engaging others in constructive dialogue (LD8 - communication) – 20%

KEY FACTORS THAT
INSTRUCTORS NEED TO
CONSIDER WHEN
DESIGNING **ASSESSMENT**
TASKS



LEVEL OF STUDY

Match assessments to the appropriate cognitive, affective, or psychomotor levels.



PEDAGOGICAL APPROACH

Complement teaching strategies with suitable assessment tasks.



INTENDED LEARNING OUTCOMES

Align assessments with course outcomes to ensure students achieve the required knowledge, skills, and attitudes.



STUDENT CHARACTERISTICS

Design inclusive assessments that cater to diverse backgrounds and learning preferences.



RESOURCE AVAILABILITY

Ensure assessments are feasible within available tools, facilities, and time.



DISCIPLINARY CONTEXT

Reflect the unique skills and methods of the subject area in assessment tasks.



COURSE AND PROGRAMME CONTEXT

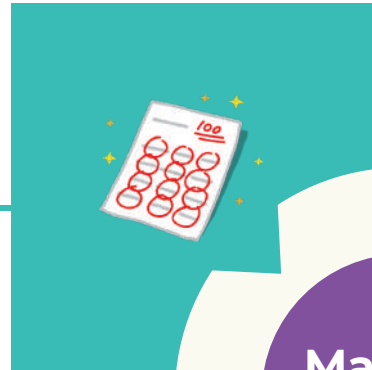
Align assessments with programme goals and avoid overlap with other courses.

Assessment Tools for Marking

Answer Scheme

01

Grading tools that outlines correct answers and allocates marks for each questions to ensure consistency and fairness in assessment.



02 | Rating Scales

Assessment tools that measure the level of a student's performance or achievement against specific criteria using a set scale (e.g., numerical or descriptive).



Checklists

03

Assessment tools used to verify the presence of required elements or tasks in student work, ensuring all key components are completed.



04 | Rubrics

Assessment tools that outline specific criteria and detailed descriptions for different performance levels, providing clear expectations and feedback on student work.



Marking Tools

"Choose tools for marking based on the task: answer schemes, rating scales assess performance levels, checklists confirm completion, and rubrics give detailed feedback. Combining tools boosts reliability and aligns assessments with goals."



WHEN? Marking schemes are used primarily in tests, quizzes, and assignments where the grading can be more straightforward.

WHY? To provide a clear outline of how points are awarded for correct answers or specific parts of an answer.

STEPS

1 Identify Question Types

- Identify assessment techniques (multiple, Short Answer, essay, ...)
- Determine the difficulty index of each question.

2 Allocate Marks

- Decide marks of each question based on step 1.

3 Create Model Answers

- Write full model answers for each question, clearly highlighting the key points and expected structure.

4 Specify Mark Distribution

- Clearly show how marks are allocated for each part of the answer to guide instructors in scoring consistently.

Assessment Tools for Marking

EXAMPLES OF ANSWER SCHEMES



Science Example

Scan here to find examples of answer schemes for a science course

SCAN HERE



SCAN HERE



Social Science Example

Scan here to find the example of answer scheme in a social science course.





WHEN? Used to assess qualities or performance on a continuum, such as behavior, attitude, or skill proficiency. It often used in surveys, evaluations of soft skills, or subjective assessments.

WHY? To provide a way to evaluate and record degrees of performance or opinion.

STEPS

1

Determine Assessment Criteria

- Identify the key aspects of the task or performance to be assessed.

2

Decide the rating scale

- Choose a numerical or descriptive range (i.e., 1-5 or Poor to Excellent).

3

Decide level of criteria

- Write full model answers for each question, clearly highlighting the key points and expected structure.

4

Align with Learning Outcomes

- Clearly show how marks are allocated for each part of the answer to guide markers in scoring consistently.

EXAMPLES OF RATING SCALES



Science Example

Scan here to find the example of rating scale in a science subject.

SCAN HERE



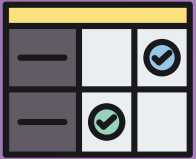
SCAN HERE



Social Science Example

Scan here to find the example of rating scale in a social science subject.





WHEN? Often used in process-oriented assignments or in assessing adherence to certain guidelines. It can be used for both self-assessment and teacher evaluation.

WHY? To ensure that all required elements or steps are completed.

STEPS

1

Identify Key Elements

- List all essential components or tasks that need to be included in the assessment.

2

Align with Objectives

- Ensure each item reflects the learning goals or outcomes of the assignment.

3

Organize Logically

- Arrange the checklist items in a clear, logical order for easy use.

4

Make Items Clear and Specific

- Ensure each item is clearly stated to avoid ambiguity.

Assessment Tools for marking

EXAMPLES OF CHECKLISTS



Science Example

Scan here to find the example of checklist in a science subject.

SCAN HERE



SCAN HERE



Social Science Example

Scan here to find the example of checklist in a social science subject.



Type of Rubrics

Analytic Rubric

WHAT? Breaks performance into criteria, each rated separately with detailed descriptors.
WHY? Provides specific feedback.



Sample Analytic Rubric

Criteria	Poor (1-2)	Fair (3-4)	Good (5-6)	Excellent (7-8)
Criteria 1				
Criteria 2				
Criteria 3				

Desired criteria in the assessment

Desired performance descriptors

Rating scale with corresponding scores or weight

Holistic Rubric

WHAT? Assesses overall performance using combined descriptors.
WHY? Focuses on general quality.



Sample Holistic Rubric

Score	Descriptions
Poor (1-2)	
Fair (3-4)	
Good (5-6)	
Excellent (7-8)	

Rating scale with corresponding scores or weight

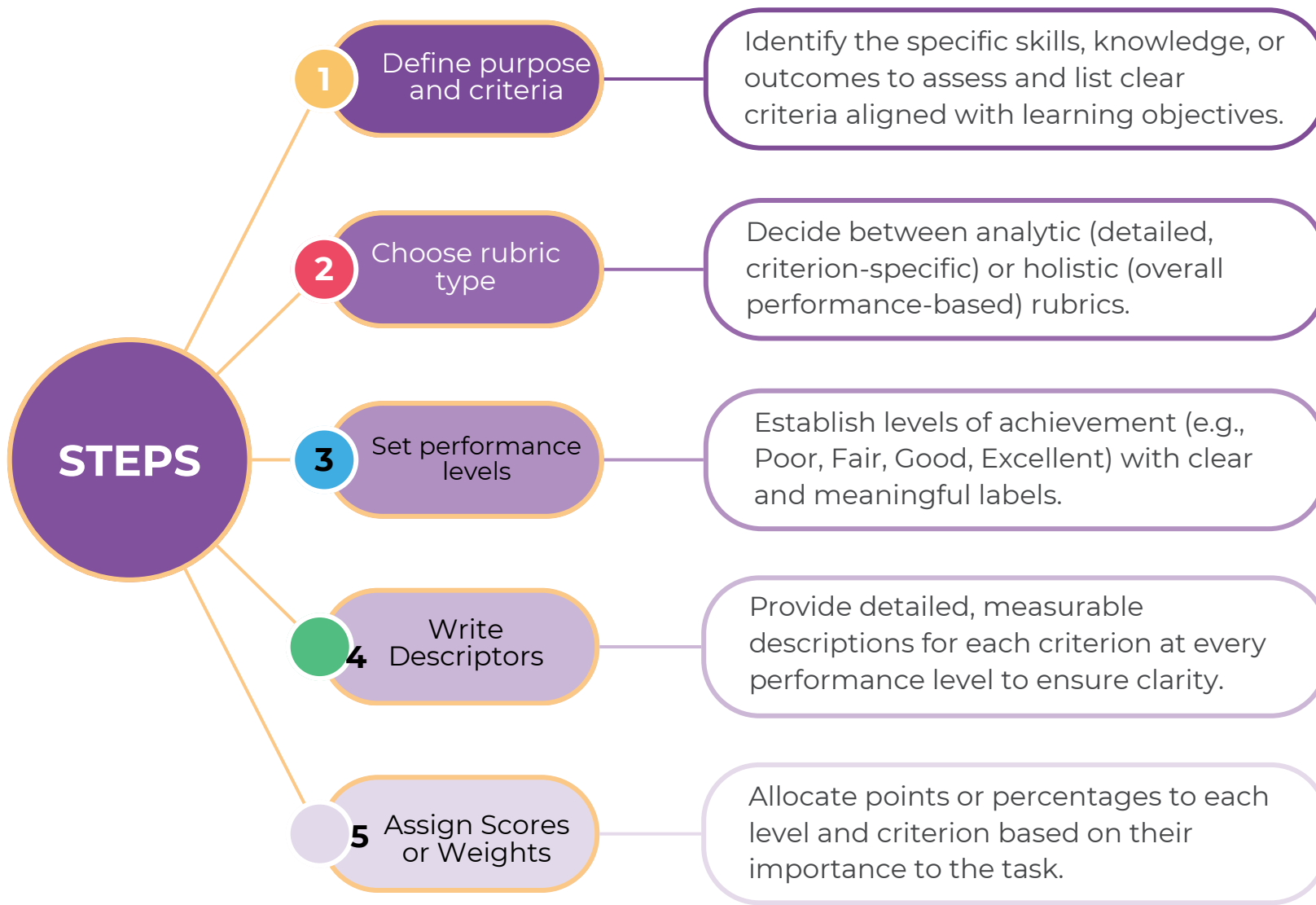
Combined desired performance descriptions

Descriptions



WHEN? Used for assessing complex tasks or projects, such as essays, presentations, or performances.

WHY? To provide clear, detailed feedback on various aspects of a student's work.



EXAMPLES OF RUBRICS



Science Example

Scan here to find the example of checklist in a science subject.

SCAN HERE



SCAN HERE



Social Science Example

Scan here to find the example of checklist in a social science subject.





When deciding on assessment, instructors need to first look at course learning outcome (CLO), teaching and learning activities and learning domains (KSA).

EXAMPLE 4.5: SELECTING ASSESSMENT TECHNIQUES AND TASKS

Course Title: Analog Electronics

Course Code: GEEI31AEL

No. of Credits: 1-1-1*

Course description:

This course offers an in-depth exploration of analog electronics, focusing on the fundamental principles, design, and application of analog electronic circuits. Students will delve into various components and circuits integral to analog electronics, including diodes, transistors, operational amplifiers, and other essential analog devices. The course places a strong emphasis on the analysis, design, and practical implementation of these circuits.

**Let's see how
to design the
assessment
for this
course.**

Course Learning Outcomes (CLOs):

Description of the course learning outcomes – CLOs At the end of the course, students are able to:	
CLO1 (K)	Analyse the basic principles of analog electronics, including the behaviour and characteristics of electronic components such as diode, transistor, and MOSFET. (MD1 – LD1, C4**)
CLO2 (S)	Build the common circuit experiment in Analog Electronics with technical explanation. (MD2 – LD2, C4; MD3 – LD3, P5)
CLO3 (A)	Develop effective communication skills for electronics field in scientific and non-scientific communities . (MD5 – LD8, A4)

*1-1-1: Lecture=1 credit, Tutorial=1 credit, Practical=1 credit

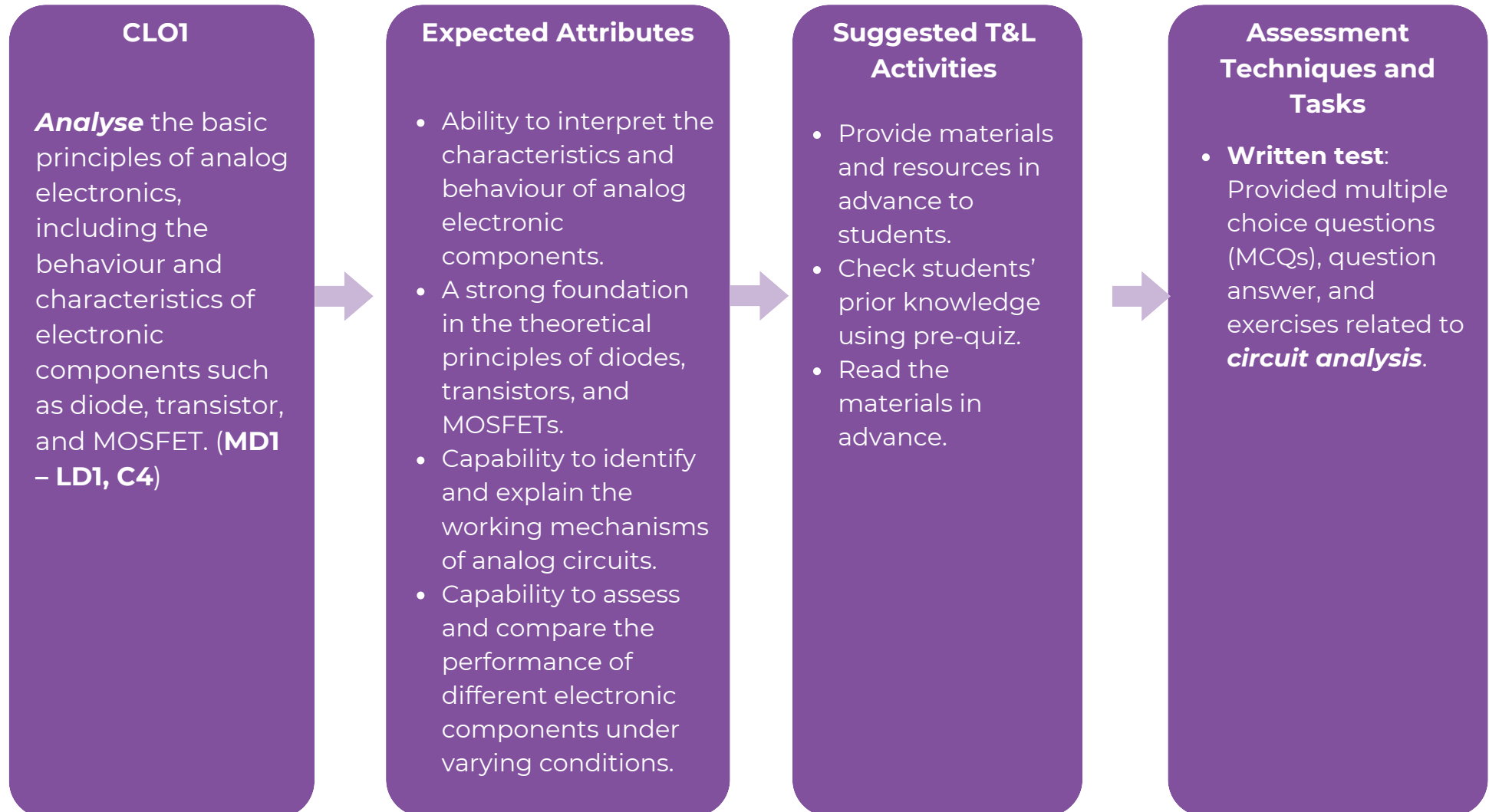
MD1-LD1, C4: Major Domain 1 - Learning Domain 1, Cognitive Level 4 (more detail see in **GTC guideline).

EXAMPLE 4.5: SELECTING ASSESSMENT TECHNIQUES AND TASKS

Course Title: Analog Electronics

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EXAMPLE 4.5: SELECTING ASSESSMENT TECHNIQUES AND TASKS

Course Title: Analog Electronics

Course Code: GEEI31AEL

No. of Credits: 1-1-1

Course Assessment Plan

CLO1

Analyse the basic principles of analog electronics, including the behaviour and characteristics of electronic components such as diode, transistor, and MOSFET. (MD1 – LD1, C4)

Assessment Techniques	Weight age (%)	T&L* Strategy/ Technique	Level of Learning (C/A/P*)	Topics				SLT** (h)
				1	2	3	4	
Class Test 1	5%	Flipped Class, K-W-L	C4	✓	✓			53
Class Test 2	5%					✓	✓	
Midterm Exam	20%			✓	✓			
Final Exam	20%					✓	✓	

Example
for
written
exam



Scan here!

Assessment
Tools

Answer
Scheme



Scan here!

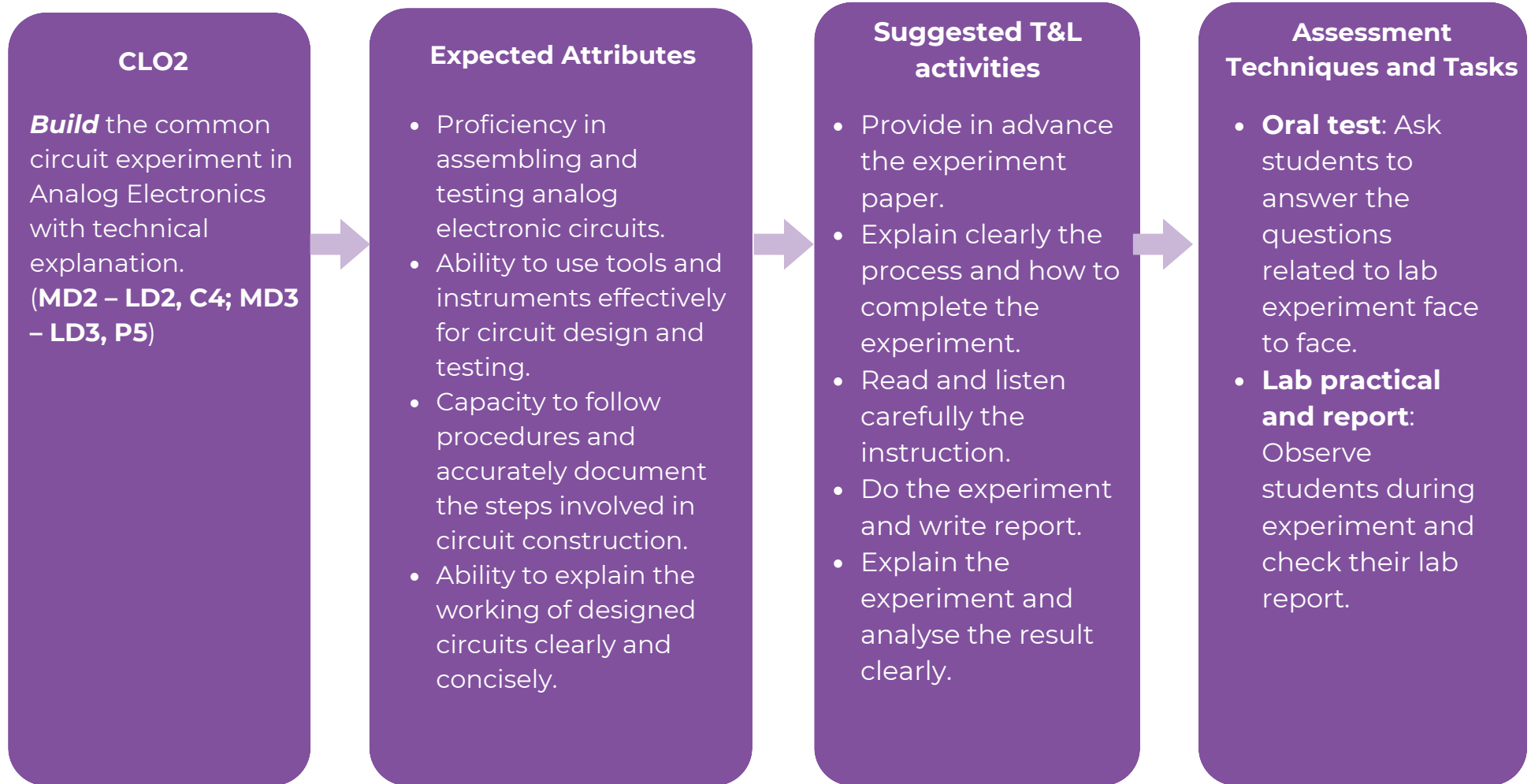
Example
for
Answer
scheme

EXAMPLE 4.5: SELECTING ASSESSMENT TECHNIQUES AND TASKS

Course Title: Analog Electronics

Course Code: GEEI31AEL

No. of Credits: 1-1-1



EXAMPLE 4.5: SELECTING ASSESSMENT TECHNIQUES AND TASKS

Course Title: Analog Electronics

Course Code: GEEI31AEL

No. of Credits: 1-1-1

Course Assessment Plan

CLO2

Build the common circuit experiment in Analog Electronics with technical explanation.
(MD2 – LD2, C4;
MD3 – LD3, P5)

Assessment Techniques	Weightage (%)	T&L* Strategy/ Technique	Level of Learning (C/A/P*)	Topics				SLT** (h)
				1	2	3	4	
Oral test	15%	K-W-L	C4, P5	√	√	√	√	22
Lab practical and report	15%			√	√	√	√	

Example for
Oral test
questions
and Lab
instruction



Scan here!

Assessment
Tool

Answer
Scheme and
Rubric



Scan here!

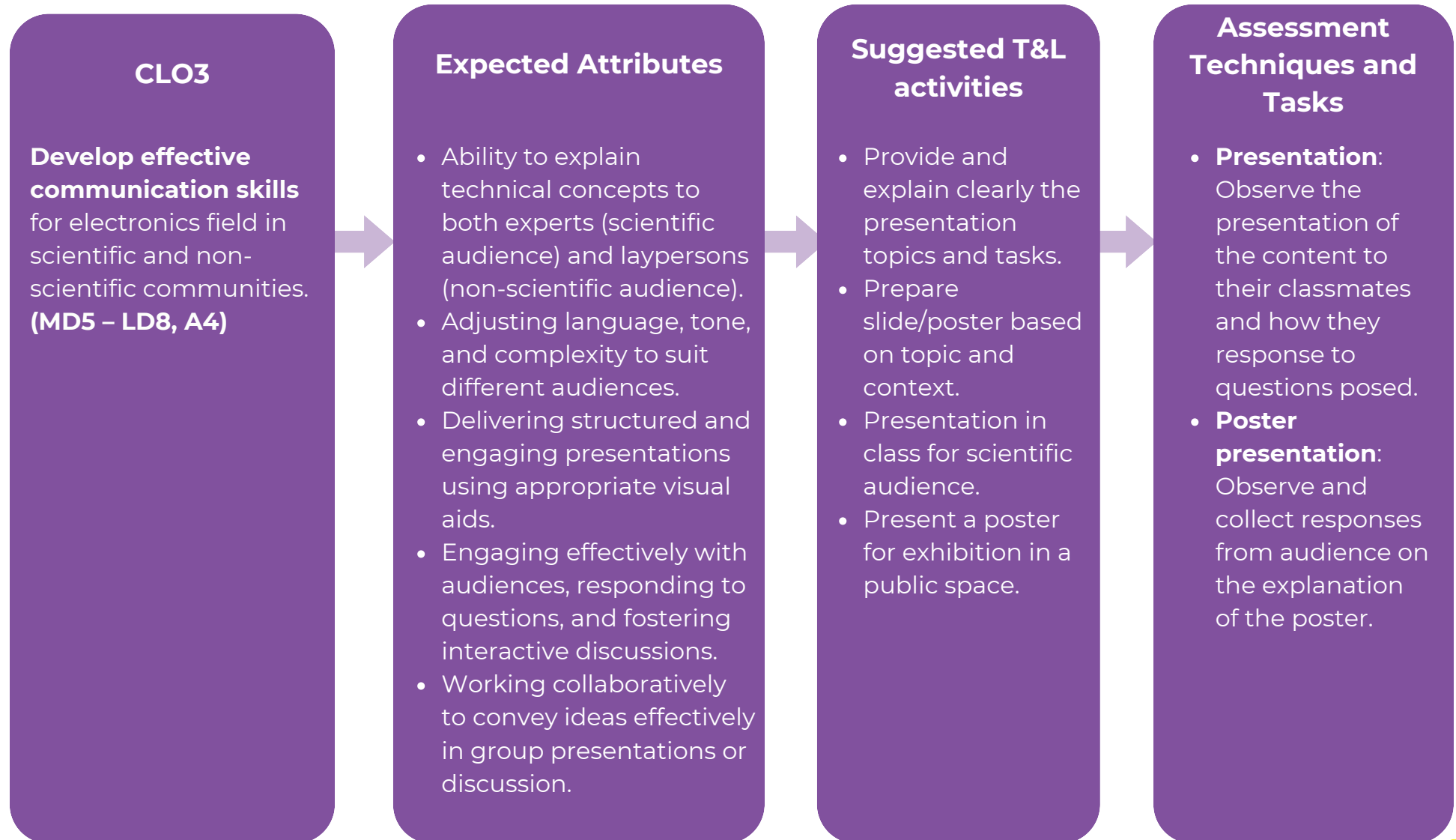
Example for
Answer
scheme
and Rubric

EXAMPLE 4.5: SELECTING ASSESSMENT TECHNIQUES AND TASKS

Course Title: Analog Electronics

Course Code: GEEI31AEL

No. of Credits: 1-1-1



EXAMPLE 4.5: SELECTING ASSESSMENT TECHNIQUES AND TASKS

Course Title: Analog Electronics

Course Code: GEEI31AEL

No. of Credits: 1-1-1

Course Assessment Plan

CLO3

Develop effective communication skills for electronics field in scientific and non-scientific communities.
(MD5 – LD8, A4)

Assessment Techniques	Weightage (%)	T&L* Strategy/ Technique	Level of Learning (C/A/P*)	Topics				SLT** (h)
				1	2	3	4	
Presentation	10%	Peer teaching	A4	√	√	√	√	22
Poster presentation	10%			√	√	√	√	

Example
for
Presentation



Scan here!

Assessment Tool

Rubric

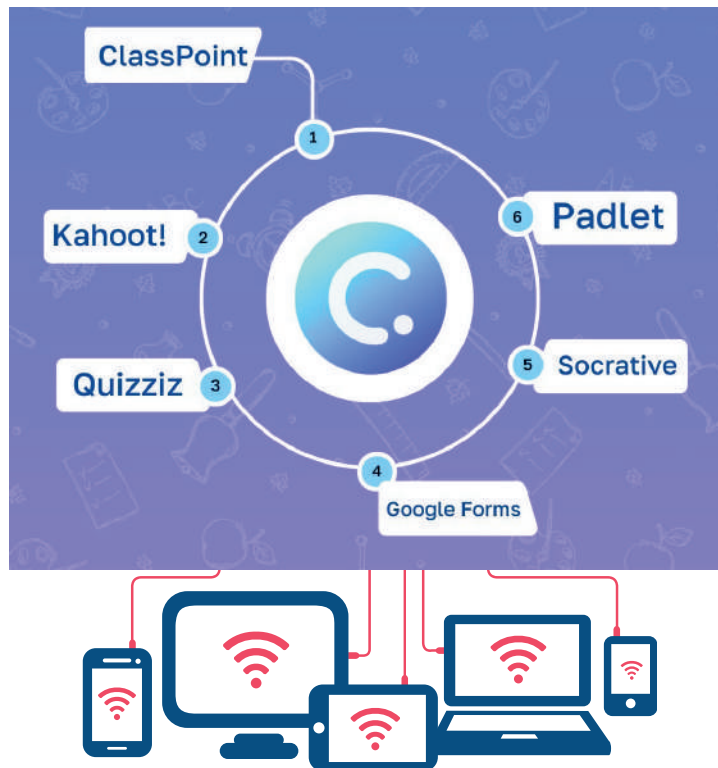


Scan here!

Example
for
Rubric

DIGITAL TOOLS FOR ASSESSMENT

5



DIGITAL tools are the innovative ways to assess students' performance and achievement, for example, online tests, knowledge checks, peer evaluations, quizzes, assignments, and examinations.

In formative assessment, instructors can use variety of digital tools to check understanding and concepts such as online quizzes, in-class questions, polls, survey or discussion.

For summative assessment, online tests, exams, or e-portfolios can be optimised to measure students' knowledge, skills and competencies.

DIGITAL TOOLS AND PLATFORMS FOR ASSESSMENT

Various digital tools and online platforms are available for educators to measure their students' learning. Some of these tools are also designed for student use.

Some EXAMPLES



A versatile tool for creating quizzes and surveys. Instructors can use it to quickly gather feedback, conduct quick polls, and analyze responses in real time.



An engaging platform that allows instructors to create quizzes and polls. It's particularly useful for making assessments fun and interactive, and it provides instant feedback.



padlet

A digital bulletin board where students can post responses, share ideas, and reflect on their learning. It allows for a range of multimedia inputs like text, images, and videos.



This tool allows teachers to create quizzes, polls, and exit tickets. It provides real-time feedback and analytics to help teachers gauge student understanding.



A platform that combines interactive presentations with formative assessments. Teachers can create lessons with embedded quizzes, polls, and open-ended questions.



Similar to Kahoot!, Quizizz lets teachers create quizzes that students can take at their own pace. It offers instant feedback and detailed reports on student performance.

DIGITAL TOOLS AND PLATFORMS FOR ASSESSMENT

Some EXAMPLES



This tool allows teachers to create interactive video lessons by embedding questions and prompts into videos. It helps assess student understanding as they watch.



An open-source learning management system (LMS) that supports a variety of formative assessment tools, including quizzes, forums, and surveys.



A video discussion platform where students can record and share video responses. It's useful for assessing student understanding and promoting reflection.



A Google Sheets add-on for grading and analyzing Google Forms responses. It automates the grading process and provides detailed reports on student performance.



A digital portfolio tool that allows students to document and reflect on their learning.

Instructors can provide feedback and assess progress through student submissions



Microsoft Teams

It allows students to work together on shared projects or group assignments. With MS Teams, instructors can create questions, quizzes, and assigned assignments; and provide instruction to students.



This tool allows for real-time polling and surveys during live sessions. It can be used for quick formative assessments and to gauge student opinions.



This platform provides tools for creating various types of assessments, including quizzes and short answer questions. It offers real-time data and analytics to inform instruction.

Assessment via Kahoot

The screenshot shows the Kahoot! web interface. On the left is a navigation sidebar with links to Home, Discover, AccessPass, Library, Reports, Groups, Marketplace, Kahootopia, and Channels. The main content area features a quiz titled "Electrical Machines: Pre-Quiz 1" by user "limping2", updated 3 months ago. A diagram of a cylinder with a force F applied at an angle θ to the radius r is shown, with the equation $r \sin(180^\circ - \theta) = r \sin \theta$. The quiz consists of four questions:

- 1 - Quiz: Which electrical device below is not an electrical machinery? (20 sec)
- 2 - True or false: Magnetic fields are the key mechanism by which energy is converted from one form to another in electrical machines. (20 sec)
- 3 - True or false: Torque is a force applied to an object to move on from some position to another position. (20 sec)
- 4 - Quiz: A force $F = 20\text{N}$ applied to a cylinder radius $r = 0.1\text{m}$ with angle $\theta = 120^\circ$. Find the torque on cylinder. (20 sec)

Below the questions is a "Resource credits" section. The top of the interface includes the Kahoot! logo, a search bar for public content, and buttons for Upgrade, Create, and user profile/notification icons.

Assessment via MS Teams

The screenshot displays the Microsoft Teams web interface. On the left sidebar, the 'All teams' section is active, showing a team named '2024-25: Student Project I (Group 3)'. Below this, a list of options includes 'Home page', 'Class Notebook', 'Classwork', 'Assignments', 'Grades', 'Reflect', and 'Insights'. The 'Assignments' option is selected. The main content area shows the 'Assignments' page for the selected team. At the top, there is a 'Back' link. The assignment title is 'Presentation 1', with a due date of 'October 27, 2024 11:59 PM' and '5 points possible'. The instructions state: 'This assignment required students submit a slide presentation in pdf format. The presentation must cover two main ideas: 1. Team builder that covers the role, responsibility, and short description task of each member. 2. Explain the research data (from social media, survey form, ...) to support the main problem of your proposed project.' The evaluation criteria are based on the 'Presentation 1 and Report 1 Marking Rubric'. Two bullet points specify: 'The deadline is on 27th Oct 2024 before 11:59pm.' and 'The group who submit late will automatically get zero score.' The 'Student work' section shows 'None'.

Activity

Calendar

Teams

Assignments

...

Apps

< All teams

2024-25: Student Project I (Group 3) ...

Home page

Class Notebook

Classwork

Assignments

Grades

Reflect

Insights

▼ Main Channels

General

Assignments

< Back

Presentation 1

Due October 27, 2024 11:59 PM

Points
5 points possible

Instructions

This assignment required students submit a slide presentation in pdf format. The presentation must cover two main ideas:

1. Team builder that covers the role, responsibility, and short description task of each member.
2. Explain the research data (from social media, survey form, ...) to support the main problem of your proposed project.

The evaluation criteria based on the **Presentation 1 and Report 1 Marking Rubric.**

- The deadline is on 27th Oct 2024 before 11:59pm.
- The group who submit late will automatically get zero score.

Student work

None

Assessment via QUIZZZ

quizizz.com/admin/reports/675b80e45c979d3c1da642c1/overview

QUIZZZ BASIC

+ Create

Explore

Library

Reports

Classes

Accommodations

Quizizz AI

20 activities created

Upgrade

Search in my reports

Get help

Food Packaging and Storage

Completed

Live Dashboard

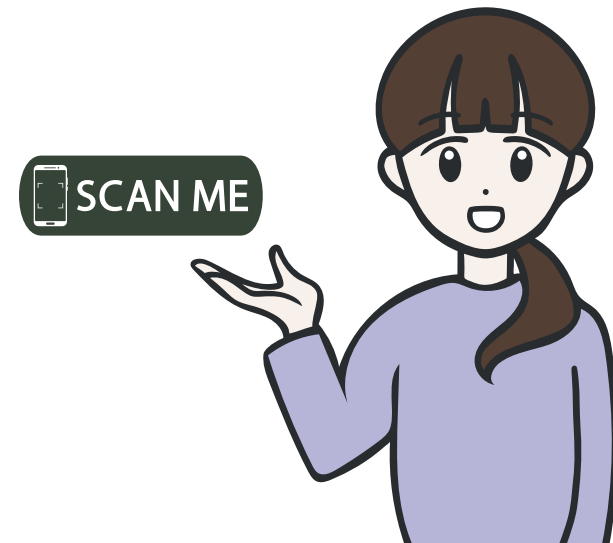
Assign homework

Participants Questions Accommodations Overview Tags BETA

Sort by: Accuracy

Participant	Score	Points Out of 9	Q1 56%	Q2 81%	Q3 56%	Q4 75%	Q5 69%	Q6 69%	Q7 63%	Q8 100%	Q9 81%
Kanha Nheb (Kanha Nheb)	8320	9 (100%)	✓	✓	✓	✓	✓	✓	✓	✓	✓
So Kim (Kit Sokim)	8800	9 (100%)	✓	✓	✓	✓	✓	✓	✓	✓	✓
Sreynou Ou (Ou Sreynou)	8420	9 (100%)	✓	✓	✓	✓	✓	✓	✓	✓	✓
Ren Sreirath	8360	9 (100%)	✓	✓	✓	✓	✓	✓	✓	✓	✓
ឈុំ	8560	9 (100%)	✓	✓	✓	✓	✓	✓	✓	✓	✓
ជំរក់ (ជំរក់)	7740	8 (89%)	✓	✓	✓	✓	✓	✗	✓	✓	✓
Sal Kanhchna (Sal Kanhchna...)	6110	7 (78%)	✓	✓	✓	✓	✓	✗	✗	✓	✓
Yoeurt Senapatey	6510	7 (78%)	✗	✓	✓	✗	✓	✓	✓	✓	✓
លុះ ឡាន	5710	7 (78%)	✗	✓	✓	✓	✗	✓	✓	✓	✓
Sophary	5320	6 (67%)	✓	✓	✗	✓	✓	✓	✗	✓	✗
Kosal Sothearith	4750	5 (56%)	✗	✓	✗	✗	✓	✗	✓	✓	✓
Ly Ly (Ly Lan)	4360	5 (56%)	✗	✓	✗	✓	✗	✗	✓	✓	✓
ស្រី ឡាន (ស្រី ឡាន)	4320	5 (56%)	✓	✗	✗	✓	✗	✓	✗	✓	✓
Soksomnang	2510	3 (33%)	✗	✗	✗	✗	✓	✓	✗	✓	✗
Suon Kanika	2840	3 (33%)	✗	✗	✗	✓	✗	✗	✗	✓	✓

Instruction for how to use Quizizz as digital tool for assessment



Assessment via Padlet

[illegible]

FEEDBACK OF STUDENT ASSESSMENT 6

FEEDBACK means an explanation of what students are doing correctly and incorrectly, with the focus on what they are doing right.

Instructors can provide feedback of assessment to students **before and after the assessment**, test or exam to assist students in improving their performance.



Feedback Before Assessment - Provide details on your expectation on the assessment

1. Clarification of Objectives

Ensure students understand the goals and expectations of the assessment.

2. Study Resources

Provide materials, study guides, resources to help student prepare effectively.

3. Practice Opportunities

Offer practice tests or activities to familiarise students with the format and content.

4. Skill Development

Focus on specific skills or knowledge areas that will be assessed, providing guidance on how to improve.

កិច្ចការស្រាវជ្រាវ (Assignment)

បរិញ្ញាបត្រជំនាញ៖ កែច្នៃអាហារ ឆ្នាំទី៣ ឆមាសទី១

មុខវិជ្ជា៖ Postharvest Processing Technology

គ្រូបង្រៀន៖ ហ៊ិន ស៊ីយ៉ា

ឆ្នាំសិក្សា៖ 2024-2025

Telegram៖ 096 390 8659

ប្រធានបទស្រាវជ្រាវ៖ សិក្សាលើបច្ចេកវិទ្យាកែច្នៃផលិតផលស្រស់បន្លែ ឬ ផ្លែឈើដើម្បីពន្យារអាយុកាល និងគុណភាពណាមួយដែលចង់ដោះស្រាយ

ការរៀបចំ៖ 1. ដកស្រង់ចេញពីអត្ថបទស្រាវជ្រាវវិទ្យាសាស្ត្របោះពុម្ពមិនលើស៥ឆ្នាំ (3អត្ថបទ)

2. សំយោគទិន្នន័យនៃអត្ថបទទាំង៣ ជាទម្រង់អត្ថបទផ្ទាល់ខ្លួន

3. រៀបស្តាយធ្វើបទបង្ហាញការងារ (រយៈពេល១៥នាទី)

4. សំណួរ-ចម្លើយ (រយៈពេល១០នាទី)

ពិន្ទុ៖ 20% (10% របាយការណ៍ និងការរៀបចំ, ៥% ការធ្វើបទបង្ហាញ, ៥% សមត្ថភាពឆ្លើយសំណួរ)

កាលបរិច្ឆេទប្រមូល៖ បន្ទាប់ពីប្រឡងពាក់កណ្តាលឆមាសរួច។

Feedback After Assessment

1. Performance Analysis

Provide detail feedback on what was done well and areas for improvement.

2. Individual Strengths and Weaknesses

Highlight specific strengths and weaknesses in knowledge or skills.

3. Actionable Strategies

Suggest targeted strategies for improvement based on assessment.

4. Reflection Opportunities

Encourage students to reflect on their performance and learning process.

5. Reflect

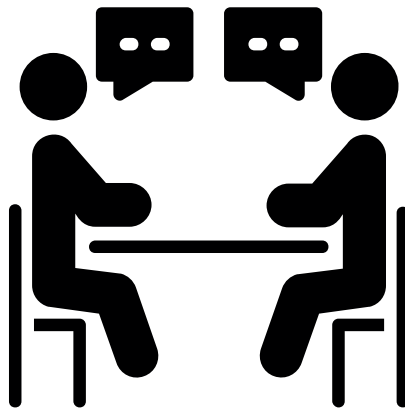
Discuss future assessments of learning goals, incorporation lessons learned from the current assessment.

FEEDBACK Strategies



Written feedback

- Systematically schedule and plan the process of providing feedback.
- Provide written feedback on students' assignments, projects, and assessment tasks.
- Highlight areas of strength and suggested comments for improvement in the written feedback.
- Provide feedback individually or in group.



Oral feedback

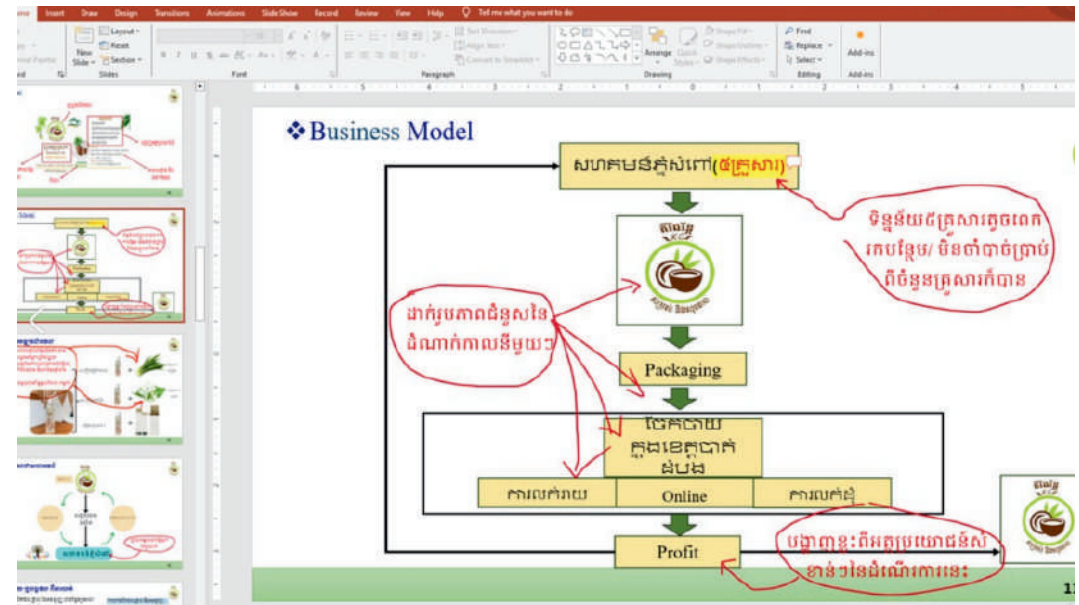


- Provide oral feedback at any time, in person, in class, over the phone or through video conference.
- Provide immediate oral (formal or informal) feedback on student progress.

Examples



Written feedback



Oral feedback



How to Give Effective Feedback for Student Learning



SUGGESTED COMMENTS

- Giving clear and practical comments.
- Enabling students to make necessary revisions to their work.
- Effectively communicating to students followed by explanations or examples.



GIVEN IN A TIMELY MANNER

- Setting a clear timeframe in giving feedback after a test/exam or after marking assignments. e.g. no later than 14 working days after students have turned in the assignment.



METHODS OF GIVING FEEDBACK

- Individual session.
- Discussion in class: if many students are facing difficulties with the same questions.
- Peer feedback.



MOTIVATION AND RECOGNITION

- Acknowledging areas where students have worked well individually or in groups.
- Recognizing students' work hence motivating them to keep improving to achieve their goals.

"Communication and negotiation are important for students to reach their full potential."

CLO AND PLO ATTAINMENT

7

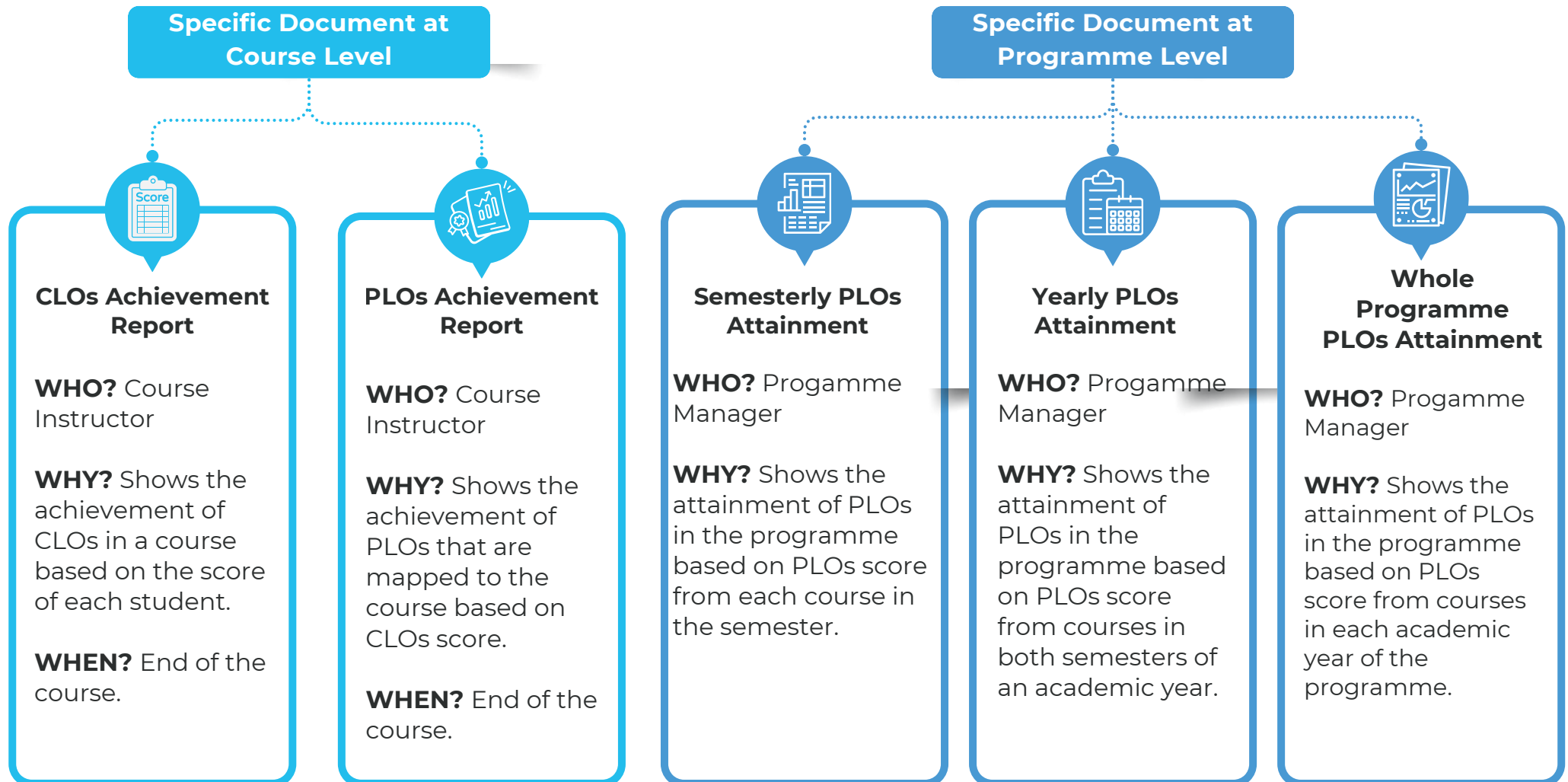
There are several ways to check the achievement of Programme Learning Outcomes (PLOs). However, in this playbook, the focus is on determining PLO attainment based on CLO scores.



The report on the attainment of the PLOs is crucial for monitoring and evaluation, aimed for programme improvement. To determine attainment of the PLOs, the documents from the **course level** are required from the **course instructors**, such as CLOs achievement report and PLOs achievement report. At **programme level**, the reports are compiled semesterly, yearly, and at the end of the programme to enable the **programme manager to produce the PLOs attainment report**.

PERSON-IN-CHARGE AND DOCUMENTS REQUIRED TO DETERMINE PLO ATTAINMENT

To assess the achievement and improvement of a programme, **specific documents** are required. At the **course level**, the **instructor** must submit these documents to the **programme manager**. The **programme manager**, in turn, consolidates this information to produce a comprehensive document at the **programme level**.





One course within the “Electronics and Automation” Programme is selected as an example to illustrate the process of preparing a report for CLO and PLO attainment.

SELECTED PROGRAMME

Programme title: Electronics and Automation

Department: Electrical and Energy Engineering

Institution: Institute of Technology of Cambodia

An illustration from an engineering programme is used to demonstrate on the necessary documentations needed and the procedures involved in preparing the report on PLO attainment.

Table PLOs statement

PLO1	At the end of the EA programme, students are able to apply new knowledge in the fields of electronics and smart automation systems.
PLO2	On successful completion of the programme, students are able to design engineering products/solutions that meet the specified needs with consideration of social economic factors in the field of electronics and automation.
PLO3	Students are able to conduct appropriate experimentation, analyze and interpret data, and use engineering judgement to draw conclusions in the scope of electronics and automation systems development.
PLO4	By the completion of the EA programme, learners are able to develop a team or teamwork whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
PLO5	By the end of the EA programme, students are able to demonstrate professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
PLO6	On successful completion of the EA programme, learners are able to identify business problems accurately and effectively across a wide range of business domains.
PLO7	Learners in EA programme are able to recognize ethical and professional responsibilities in the engineering context with consideration to the societal impacts.
PLO8	Students in EA programmes are able to apply written, oral, and graphical communication with appropriate usage of the technical literature.
PLO9	By the successful completion of the EA programme, students are able to use computer software for data analysis and solving complex problems.
PLO 10	Students in EA programme are able to use both quantitative and qualitative techniques to forecast the trend in electronics and automation.

SELECTED COURSE: POWER ELECTRONICS, SEMESTER 1 YEAR 4

Programme title: Electronics and Automation

Department: Electrical and Energy Engineering

Institution: Institute of Technology of Cambodia

An illustration from an engineering programme is used to demonstrate on the necessary documentations needed and the procedures involved in preparing the report on PLO attainment.

Table of Course-PLOs Mapping

Year	Semester	Course Code	Course Title	Credit	Program Learning Outcomes (PLOs)									
					1	2	3	4	5	6	7	8	9	10
1	1	DTC111KLC	Khmer Language for Communication	2	P			P				F		
		DTC111HAC	Humanity and Civilization	2	P				F		P			
...	...	...	...		...									
4	1	GEEI41ENG	English V	1	P			M	M		P			
		GEEI41FRE	French VII	1	P						M	P		
		GEEI41PEL	Power Electronics	3	F	P	P					P		
		GEEI41REM	Research Methodology	2	P			M	M		P			
		GEEI41MOD	Motor Drive	3	P	P	M					P		
		GEEI41MCS	Modern Control Systems	P		P							M	P
		GEEI41INP	Industrial Network Protocol	P		P							M	P
		GEEI41SPP	Student Project Part I	P		P	P						P	P
...	...	...	...		...									
5	1	GEEI51ELV	Extra-low voltage design	3		F	P							
	2	GEEI51WSP	Work-life and social psychology	1	P				M		M			
		GEEI52FYI	Final Year Internship	12	P	P	P	P	P	P	P	P	P	P
Total		63 Courses		144	F=13, M = 0, P = 48	F=1, M = 3, P = 20	F=4, M = 3, P = 26	F=0, M = 3, P = 7	F=1, M = 2, P = 5	F=1, M = 1, P = 1	F=0, M = 16, P = 5	F=1, M = 3, P = 19	F=0, M = 5, P = 11	F=0, M = 9, P = 8

The selected course has 3 CLOs.

Course title: Power Electronics

Programme title: Electronics and Automation

Department: Electrical and Energy Engineering

Institution: Institute of Technology of Cambodia

To better understand the documentations needed at the course level, a course from Semester 1, Year 4, of the programme is used to demonstrate the steps for the development of the document.

Table of CLOs statement

Description of the course learning outcomes – CLOs At the end of the course, students are able to:	
CLO1 (K)	Select the power electronics components and structures for suitable purposes. (MD1 – LD1, C4)
CLO2 (S)	Design a suitable and economical power electronics converter for requirement specification. (MD2 – LD2, C6; MD3 – LD3, P6)
CLO3 (A)	Develop effective communication skills of power electronics systems in scientific and non-scientific communities. (MD5 – LD8, A4)

K: Knowledge

S: Skill

A: Attitude

MD1 - LD1, C4: Major Domain 1 - Learning Domain 1, Cognitive level 4

CLOS-PLOS MAPPING

Course title: Power Electronics

Programme title: Electronics and Automation

Department: Electrical and Energy Engineering

Institution: Institute of Technology of Cambodia

To better understand the documentations needed at the course level, a course from Semester 1, Year 4, of the programme is used to demonstrate the steps for the development of the document.

Table of CLOs-PLOs mapping

CLO	Programme Learning Outcome (PLO)									
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
CLO1	√ (F-50%)									
CLO2		√ (P-10%)	√ (P-15%)							
CLO3								√ (P-25%)		

F: Contributes fully - more than 50%

M: Contributes moderately - between 30% to 50%

P: Contributes partially - less than 30%.

COURSE ASSESSMENT PLAN

Course title: Power Electronics

Programme title: Electronics and Automation

Department: Electrical and Energy Engineering

Institution: Institute of Technology of Cambodia

To better understand the documentations needed at the course level, a course from Semester 1, Year 4, of the programme is used to demonstrate the steps for the development of the document.

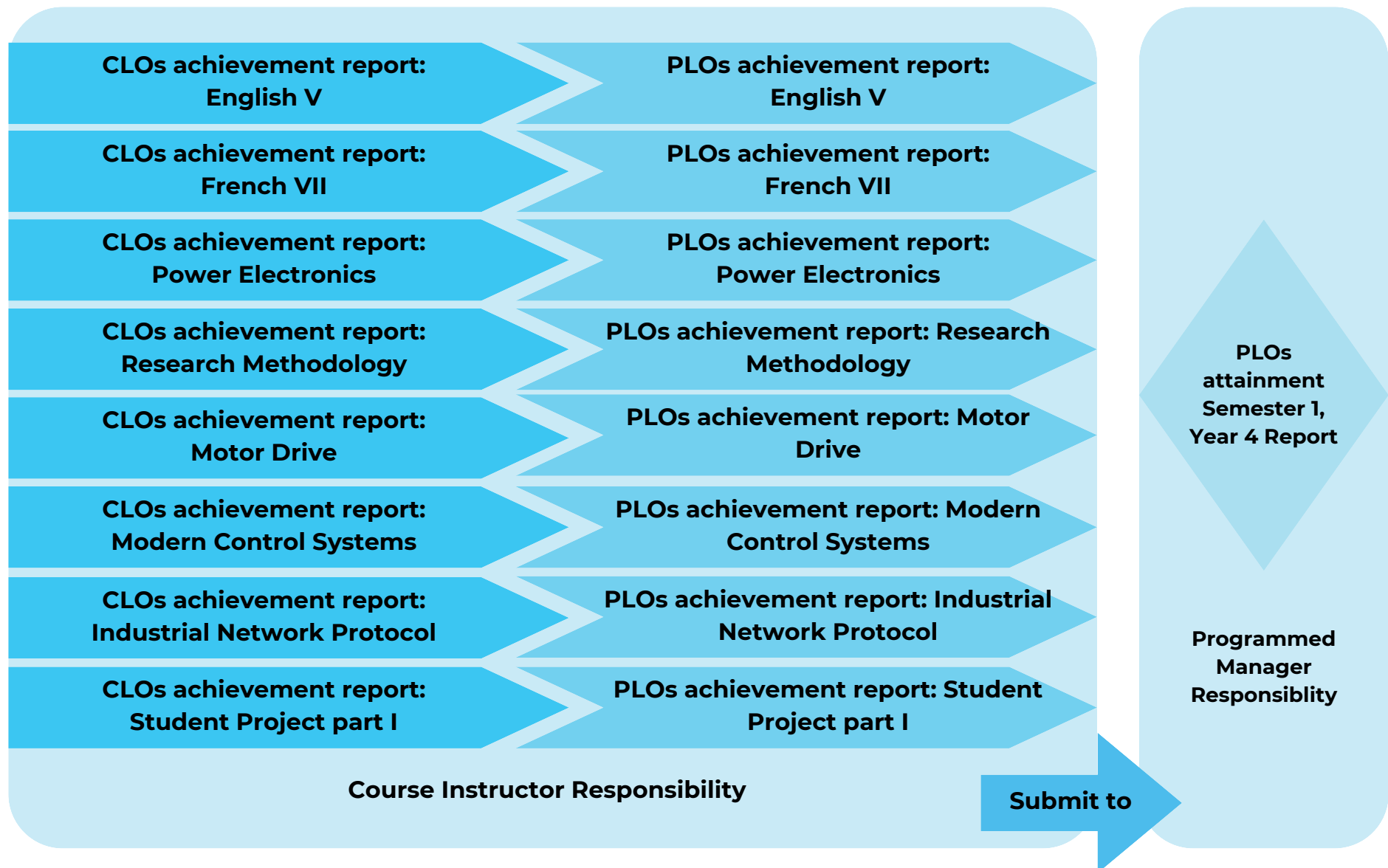
Table of Course Assessment Plan

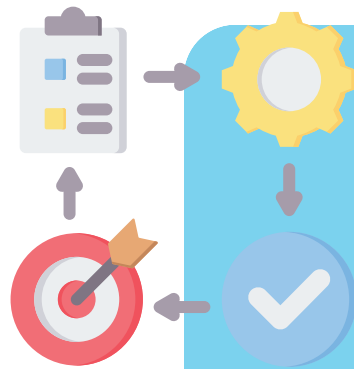
CLOs statement	PLOs	Assessment Methods	Weightage (%)	T&L* Strategy Technique	Level of Learning (C/A/P*)	Topics			SLT* * (h)
						1	2	3	
At the end of the course, students are able to select the power electronics components and structures for suitable purposes. (MD1 – LD1, C4)	PLO1	Class Test 1	5%	Peer teaching	C4	√			60
		Class Test 2	5%				√		
		Midterm Exam	20%			√	√		
		Final Exam	20%				√	√	
At the end of the course, students are able design a suitable and economical power electronics converter for requirement specification. (MD2 – LD2, C6; MD3 – LD3, P6)	PLO2	Lab Prototype and report	10%	K-W-L	C6				30
	PLO3		15%		P7	√	√		
At the end of the course, students are able develop effective communication skills of power electronics systems in scientific and non-scientific communities. (MD5 – LD8, A4)	PLO8	Presentation and report	25%	PoBL	A4			√	30

*T&L: Teaching and Learning

**SLT: Student Learning Time

PROCESS OF CONSOLIDATING THE SELECTED PROGRAMME PLOs ATTAINMENT FOR SEMESTER 1, YEAR 4





STEPS to prepare CLO and PLO achievement reports



COURSE LEVEL: CLO ACHIEVEMENT REPORT



Report Preparation steps



Collect CLO Score

Input students' scores from all assessments mapped to the CLO into a table.



Calculate students CLO score

Sum all assessment scores to find the total CLO score of each student.



Evaluate students CLO result

A student passes for the specific CLO if his/her CLO score is equal to or exceeds the **pass condition**.



Evaluate CLOs in the course

A CLO is achieved if the number of students who passed the CLO is equal to or greater than the **achievement condition**.



Note: The **pass** and **achievement condition** in steps 3 and 4 depend on the decision of faculty/department and institution.

EXAMPLE 7.1: CLO1 ACHIEVEMENT REPORT 3-CREDIT COURSE IN AN ELECTRONICS AND AUTOMATION ENGINEERING PROGRAMME

Course Assessment Plan: Mapped Assessments to CLO1

CLOs	PLOs	Assessment Techniques	Weightage (%)
1	...	Class Test 1	5%
		Class Test 2	5%
		Midterm Exam	20%
		Final Exam	20%

STEP 1. Input all assessment score from Class Test 1, Class Test 2, Midterm, and Final that mapped to CLO1 (see in CAP).

STEP 2. Find total CLO score of each student by summing each assessment score input in step 1.

STEP 3. Determine if the student pass or fail CLO1. A student passes CLO1 is his/her CLO1 score is **equal or greater than 25** (50% of max. CLO1 score).

STEP 4. 8 Students passed the CLO1 and only 1 student fail. The pass percentage is 89% over the achievement condition of 50%. Thus, the CLO1 of this course is achieved.

Student ID	Student Name	Mark Criteria								Total		CLO 1 Pass/Fail	CLO1 Grade	CQI
		Class Test #1		Class Test #2		Midterm		Final						
		CLO score (5%)	Pass/Fail	CLO score (5%)	Pass/Fail	CLO score (20%)	Pass/Fail	CLO score (20%)	Pass/Fail	Score Max. 50	Score Max. in (%)			
IDxxxA	Student A	0.00	Fail	0.65	Fail	6.80	Fail	12.80	Pass	20.25	41%	Fail	E	CQI: Student A - Group he/she with a good student - Provide more problem with feedback
IDxxxB	Student B	2.80	Pass	2.85	Pass	10.80	Pass	17.40	Pass	33.85	68%	Pass	C+	
IDxxxC	Student C	2.30	Fail	4.30	Pass	13.00	Pass	17.80	Pass	37.40	75%	Pass	B	
IDxxx D	Student D	2.35	Fail	4.30	Pass	13.60	Pass	14.00	Pass	34.25	69%	Pass	C+	
IDxxxE	Student E	4.30	Pass	2.85	Pass	15.60	Pass	15.60	Pass	38.35	77%	Pass	B	
IDxxxF	Student F	4.45	Pass	2.80	Pass	19.40	Pass	17.80	Pass	44.45	89%	Pass	A	
IDxxxC	Student G	4.45	Pass	3.35	Pass	13.40	Pass	15.80	Pass	37.00	74%	Pass	B	
IDxxxH	Student H	3.90	Pass	3.90	Pass	17.80	Pass	15.60	Pass	41.20	82%	Pass	B+	
IDxxxI	Student I	4.85	Pass	3.40	Pass	19.60	Pass	13.40	Pass	41.25	83%	Pass	B+	
											# Fail	1	Avg. CLO Achieved Condition	Avg. CLO Achiev.ement
											# Pass	8		
											Fail %	11%	50%	Yes
											Pass %	89%		

EXAMPLE 7.2: CLO2 ACHIEVEMENT REPORT

3-CREDIT COURSE IN AN ELECTRONICS AND AUTOMATION ENGINEERING PROGRAMME

Course Assessment Plan: Mapped Assessments to CLO2

CLOs		PLOs	Assessment Techniques	Weightage (%)
2	...	PLO2	Lab Prototype and report	10%
		PLO3		15%

Student ID	Student Name	Mark Criteria										Total		CLO 2 Pass/Fail	CLO2 Grade	CQI
		Select Device		Construct		Modeling PE		Coding		Prototypes						
		CLO score (5%)	Pass/Fail	CLO score (5%)	Pass/Fail	CLO score (5%)	Pass/Fail	CLO score (5%)	Pass/Fail	CLO score (5%)	Pass/Fail	Score Max. 25	Score Max. in (%)			
IDxxxA	Student A	0.00	Fail	0.00	Fail	0.00	Fail	2.15	Fail	2.75	Pass	4.90	20%	Fail	F	CQI: Students who fail - Group he/she with a good student - Provide more practical work to produce PCB.
IDxxxB	Student B	1.80	Fail	1.15	Fail	1.15	Fail	1.60	Fail	3.35	Pass	9.05	36%	Fail	F	
IDxxxC	Student C	2.15	Fail	2.00	Fail	2.00	Fail	2.75	Pass	3.35	Pass	12.25	49%	Fail	D	
IDxxxD	Student D	2.25	Fail	2.00	Fail	2.30	Fail	2.10	Fail	3.75	Pass	12.40	49%	Fail	D	
IDxxxE	Student E	3.30	Pass	3.80	Pass	2.00	Fail	3.80	Pass	3.25	Pass	16.15	65%	Pass	C	
IDxxxF	Student F	4.30	Pass	3.75	Pass	3.75	Pass	4.35	Pass	2.85	Pass	19.00	76%	Pass	B	
IDxxxG	Student G	2.80	Pass	1.00	Fail	1.00	Fail	3.40	Pass	2.85	Pass	11.05	44%	Fail	E	
IDxxxH	Student H	3.25	Pass	3.85	Pass	3.85	Pass	4.35	Pass	2.85	Pass	18.15	73%	Pass	B	
IDxxxI	Student I	2.35	Fail	4.35	Pass	4.35	Pass	4.85	Pass	4.30	Pass	20.20	81%	Pass	B+	
													# Fail	5	Avg. CLO Pass/Fail Condition	Avg. CLO Achievem ent
													# Pass	4		
													Fail %	56%	50%	No
													Pass %	44%		
																101

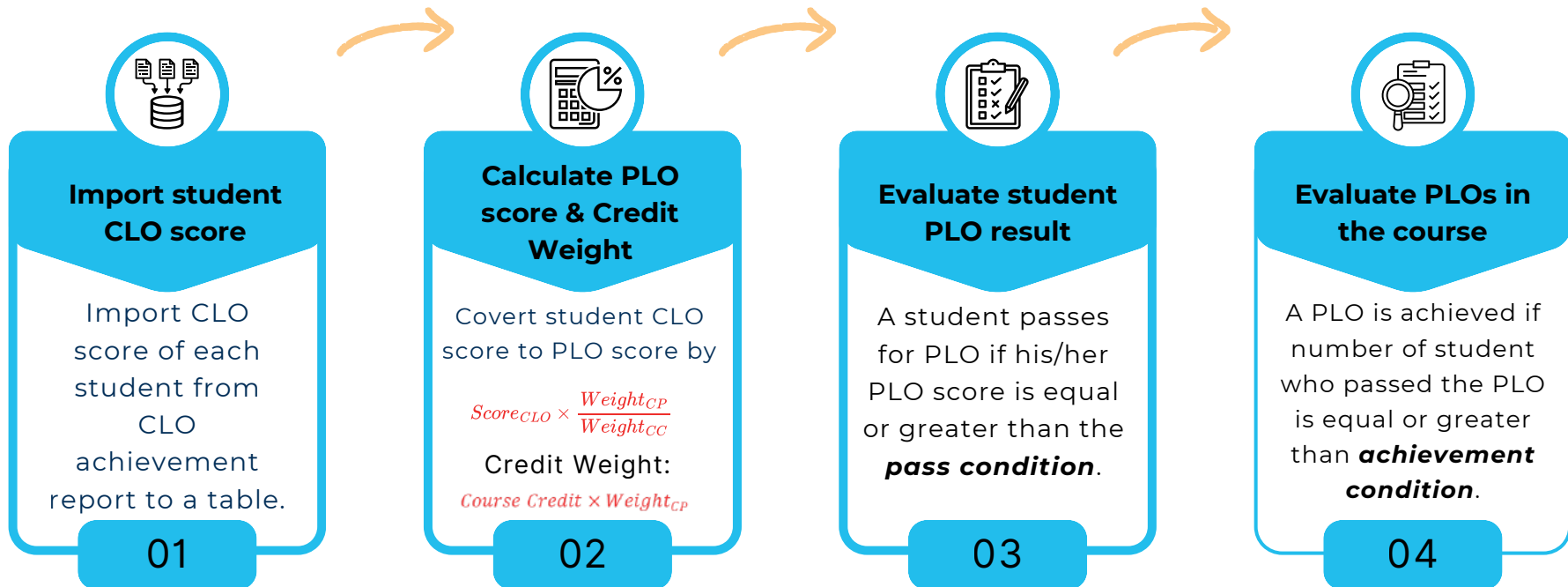
COURSE LEVEL: PLO ACHIEVEMENT REPORT



Report Preparation steps

KEY IDEA - A course assessment plan shows:

- A course contains several CLOs within the specific weightage (called Weightage CLO to Course, $Weight_{CC}$).
- A CLO maps a PLO within the specified weightage (called Weightage CLO to PLO, $Weight_{CP}$).



Note: The **pass** and **achievement condition** in step 3 and 4 depend on the decision of faculty/department and institution.

EXAMPLE : PLO1 ACHIEVEMENT REPORT FOR A 3-CREDIT COURSE IN AN ELECTRONICS AND AUTOMATION ENGINEERING PROGRAMME

Course Assessment Plan: Mapped Assessments to CLO1

CLOs	PLOs	Assessment Technique	Weightage (%)
1	PLO1	Class Test 1	5%
		Class Test 2	5%
		Midterm Exam	20%
		Final Exam	20%

STEP 1. Import the CLO1 score of each student (see CLO1 achievement report on page 70).

STEP 2. Obtain the PLO score of each student and weightage by applied the formula (see in page 71).

- **Example students A's PLO score:**

$$20.25 \times \frac{50\%}{50\%} = 20.25$$

STEP 3. Define if the student pass or fail PLO1. A student passes CLO1 is his/her PLO1 score is **equal or greater than 25** (50% of max. PLO1 score).

STEP 4. Define if the student pass or fail PLO1. A student passes PLO1 is his/her CLO1 score is **equal or greater than 25** (50% of max. PLO1 score).

Student ID	Student Name	PLO1 Score Report					
		CLO1	PLO1		Pass/Fail (50%)	PLO1 Grade	CQI
		Weight-CC 50%	Weight-CP 50%	Score Max. 50 in (%)			
Weight x Credit		50% x 3 = 1.5	1.5				
IDxxxA	Student A	20.25	20.25	41%	Fail	E	CQI: Student A • Group he/she with a good student • Provide more problem with feedback
IDxxxB	Student B	33.85	33.85	68%	Pass	C+	
IDxxxC	Student C	37.40	37.40	75%	Pass	B	
IDxxxD	Student D	34.25	34.25	69%	Pass	C+	
IDxxxE	Student E	38.35	38.35	77%	Pass	B	
IDxxxF	Student F	44.45	44.45	89%	Pass	A	
IDxxxG	Student G	37.00	37.00	74%	Pass	B	
IDxxxH	Student H	41.20	41.20	82%	Pass	B+	
IDxxxI	Student I	41.25	41.25	83%	Pass	B+	
					Fail	1	Avg. PLO Achieved Condition
					Pass	8	
					Fail %	11%	50%
					Pass %	89%	
							Avg. PLO Achieved
							Yes

Tip:

From CAP, CLO1 is fully mapped to PLO1. So, the weightage of CLO1 to PLO1 is the same as weightage of CLO1 to the course.

EXAMPLE : PLO2 AND PLO3 ACHIEVEMENT REPORT FOR A 3-CREDIT COURSE IN AN ELECTRONICS AND AUTOMATION ENGINEERING PROGRAMME



KEY IDEA: “In case one CLO is mapped to more than one PLO, the instructor must produce a report for all PLO based on the weightage.”

Course Assessment Plan:
Mapped Assessments to CLO2

CLOs	PLOs	Assessment Technique	Weightage (%)
2	PLO2	Lab Prototype and report	10%
	PLO3		15%

CLO2 Achievement Report

Student ID	Student Name	Total		CLO 2 Pass/Fail	CLO2 Grade	CQI
		Score Max. 25	Score Max. in (%)			
IDxxxA	Student A	4.90	20%	Fail	F	
IDxxxB	Student B	9.05	36%	Fail	F	
IDxxxC	Student C	12.25	49%	Fail	D	
IDxxxD	Student D	12.40	50%	Fail	D	
IDxxxE	Student E	16.15	65%	Pass	C	
IDxxxF	Student F	19.00	76%	Pass	B	
IDxxxG	Student G	11.05	44%	Fail	E	
IDxxxH	Student H	18.15	73%	Pass	B	
IDxxxI	Student I	20.20	81%	Pass	B+	
		# Fail	5	Avg. CLO Pass/Fail Condition	Avg. CLO Achievement	No
		# Pass	4			
		Fail %	56%	50%		
		Pass %	44%			

Student ID	Student Name	PLO3 Score Report						CQI
		CLO2	PLO3 Score		Pass/ Fail	PLO3 Grade		
		Weight-CC 25%	Weight-CP 15%	Score Max. 15 in (%)				
Weight x Credit		15% x 3 = 0.45	0.45					
IDxxxA	Student A	4.90	2.94	20%	Fail	F		
IDxxxB	Student B	9.05	5.43	36%	Fail	F		
IDxxxC	Student C	12.25	7.35	49%	Fail	D		
IDxxxD	Student D	12.40	7.44	50%	Fail	D		
IDxxxE	Student E	16.15	9.69	65%	Pass	C		
IDxxxF	Student F	19.00	11.40	76%	Pass	B		
IDxxxG	Student G	11.05	6.63	44%	Fail	E		
IDxxxH	Student H	18.15	10.89	73%	Pass	B		
IDxxxI	Student I	20.20	12.12	81%	Pass	B+		
				Fail	5	Avg. PLO Achieved Condition	Avg. PLO Achieved	
				Pass	4			
				Fail %	56%	50%	No	
				Pass %	44%			

PLO2 Score Report					
Student ID	PLO2 Score		Pass/Fail	PLO2 Grade	CQI
	Weight-CP 10%	Score Max. 10 in (%)			
1000					

PROGRAMME LEVEL: PLOs ATTAINMENT REPORT



Report Preparation steps



KEY IDEA:

- The **Programme Specification's mapping of courses and PLOs** serves as the basis for the data input in Step 1.

Input data

1

Input the pass percentage (PLO achievement percentage) and weightage based on the PLO achievement report of the mapped courses.

Calculation

2

Calculate the **average PLO achievement** of each PLO in the programme by using **equation 1**.

Evaluation

3

A PLO is attained if average PLOs achievement is equal or greater than **attained condition**.

Average PLO achievement:

$$Avg. PLO = \frac{CW_{course1} \times A.PLO_{course1} + \dots + CW_{courseN} \times A.PLO_{courseN}}{CW_{course1} + \dots + CW_{courseN}}$$

(equation 1)

Note:



- The **attained condition** in step 3 depends on the decision of faculty/department and institution.
- Not all PLOs could or need to be attained within a single semester or academic year, however they must be achieved throughout the duration of the entire programme.

where:

- $CW_{course1}$: Credit Weight of 1st course.
- $CW_{courseN}$: Credit Weight of Nth course.
- $A.PLO_{course1}$: Achievement of PLO 1st course.
- $A.PLO_{courseN}$: Achievement of PLO Nth course.

EXAMPLE – PLOs ATTAINMENT REPORT FOR YEAR 4 SEMESTER 1, ELECTRONICS AND AUTOMATION ENGINEERING PROGRAMME

STEP1: Collect PLOs achievement report from French VII, Power Electronics, Research Methodology, Motor Drive, Modern Control System, Industry Network, and Student Project Part I. Example of mapping to PLO1, PLO2, PLO3, and PLO8 for the Power Electronics course is given on the right-hand side.

Course-PLOs Mapping of Electronics Automation Engineering Programme

Year	Semester	Course Code	Course Title	Credit	Program Learning Outcomes (PLOs)									
					1	2	3	4	5	6	7	8	9	10
1	1	DTCI11KLC	Khmer Language for Communication	2	P			P				F		
		DTCI11HAC	Humanity and Civilization	2	P				F		P			
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	1	GEEI41FRE	French VII	1	P						M	P		
		GEEI41PEL	Power Electronics	3	F	P	P					P		
		GEEI41REM	Research Methodology	2	P			M	M		P			
		GEEI41MOD	Motor drive	3	P	P	M					P		
		GEEI41MCS	Modern control systems	P		P							M	P
		GEEI41INP	Industrial network protocol	P		P							M	P
		GEEI41SPP	Student project part I	P		P	P						P	P
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	1	GEEI51ELV	Extra-low voltage design	3		F	P							
	2	GEEI51WSP	Work-life and social psychology	1	P				M		M			
		GEEI52FYI	Final Year Internship	12	P	P	P	P	P	P	P	P	P	P
Total		63 Courses		144	F=13, M=0, P=48	F=1, M=3, P=20	F=4, M=3, P=26	F=0, M=3, P=7	F=1, M=2, P=5	F=1, M=1, P=1	F=0, M=16, P=5	F=1, M=3, P=19	F=0, M=5, P=11	F=0, M=9, P=8

To STEP2 and 3...

Example Part of data from Power Electronics Course

PLO1 Achievement Report	Fail	1	Avg. PLO Achieved Condition	Avg. PLO Achieved	Credit Weight
	Pass	8			
	Fail %	11%	50%	Yes	1.5
	Pass %	89%			
PLO2 Achievement Report	Fail	5	Avg. PLO Achieved Condition	Avg. PLO Achieved	Credit Weight
	Pass	4			
	Fail %	56%	50%	No	0.3
	Pass %	44%			
PLO3 Achievement Report	Fail	5	Avg. PLO Achieved Condition	Avg. PLO Achieved	Credit Weight
	Pass	4			
	Fail %	56%	50%	No	0.45
	Pass %	44%			
PLO8 Achievement Report	Fail	3	Avg. PLO Achieved Condition	Avg. PLO Achieved	Credit Weight
	Pass	6			
	Fail %	33%	50%	Yes	0.75
	Pass %	67%			

EXAMPLE – PLOS ATTAINMENT REPORT FOR YEAR 4 SEMESTER 1, ELECTRONICS AND AUTOMATIONS ENGINEERING PROGRAMME

STEP 2. Calculate the PLO1 to PLO10 average achievement using formula in equation 1.

- Example for **PLO1 average achievement**:

$$\frac{0.45 \times 79\% + 0.45 \times 95\% + 1.5 \times 89\% + \dots + 0.3 \times 44\%}{0.45 + 0.45 + 1.5 + \dots + 0.3} = 82\%$$

STEP 3. Define if the PLOs attained or not attained. In this example, a PLO is attained if the average PLO score is **equal or greater than attained condition 50%**.

TIP: “The steps to develop the PLO attainment for annual reporting, and whole programme reporting, is similar to the semester reporting. The difference is on the number of courses used in summarising the extent of attainment”

Semester PLOs Attainment - Semester 1 Year 4 EA Program (2022-2023)

Course ID	Course Name	Credit	PLO1		PLO2		PLO3		PLO4		PLO5		PLO6		PLO7		PLO8		PLO9		PLO10	
			CW*	Achieve (%)	CW*	Achieve (%)	CW*	Achieve (%)	CW*	Achieve (%)	CW*	Achieve (%)	CW*	Achieve (%)	CW*	Achieve (%)	CW*	Achieve (%)	CW*	Achieve (%)	CW*	Achieve (%)
GEEI41ENG	English V	1	0.45	79%											0.75	68%	0.8	68%				
GEEI41FRE	French VII	1	0.45	95%											0.85	87%	0.45	87%				
GEEI41PEL	Power Electronics	3	1.50	89%	0.30	44%	0.45	44%									0.75	67%				
GEEI41REM	Research Methodology	2	0.5	69%					1.3	47%	1.2	94%			1.7	68%						
GEEI41MOD	Motor drive	3	0.6	81%	0.9	81%	1.5	79%									1.35	77%				
GEEI41MCS	Modern control systems	3	0.75	69%			2.25	58%											2.4	79%	1.5	79%
GEEI41INP	Industrial network protocol	2	0.4	86%			1.5	62%											1.3	58%	0.9	58%
GEEI41SPP	Student project part I	1	0.3	44%			0.75	57%	0.65	23%									0.55	62%	0.85	62%
CW Total			4.25		1.2		4.2		1.3		1.2		0		3.3		3.35		4.25		3.25	
Average PLO Achievement			82%		72%		64%		47%		94%		x		73%		74%		70%		69%	
PLOs Attained (>50%)			Yes		Yes		Yes		No		Yes		x		Yes		Yes		Yes		Yes	
CQI																						

*CW (Credit Weight) = Weight x Credit

7

CONTINUOUS QUALITY IMPROVEMENT



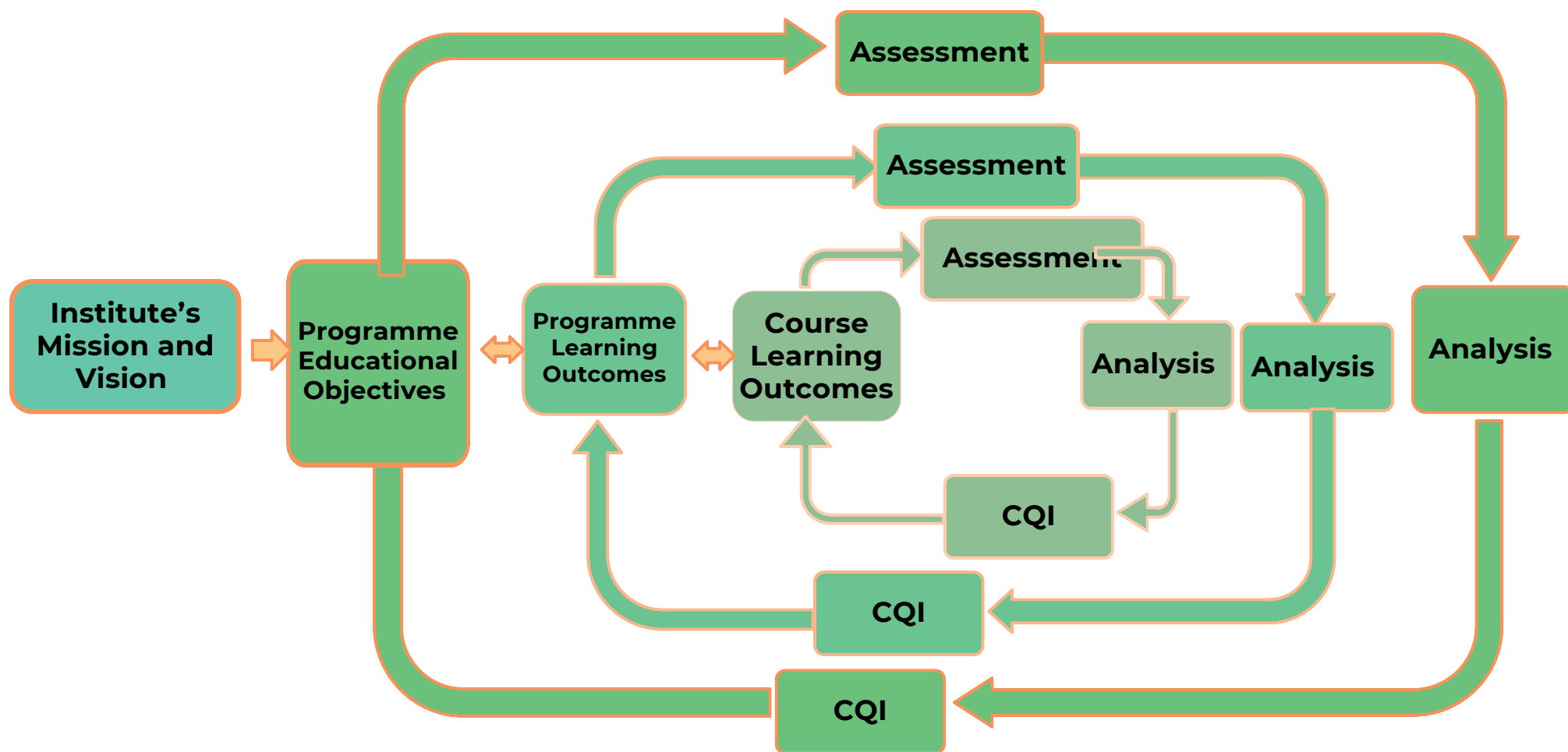
The goal of CQI as philosophy is to create a culture of ongoing assessment and adaptation for better quality outcomes.

PDCA is a specific tool or framework within the broader CQI philosophy. It provides a structured, cyclical approach for implementing continuous improvements.

CQI relies on systematic, data-driven approaches to sustain improvement, and PDCA offers that structure.

Thus, PDCA is one of the main techniques that helps facilitate CQI by providing a repeatable process to ensure that quality improvements are both systematic and sustainable over time.

QUALITY IMPROVEMENT PLAN CYCLE



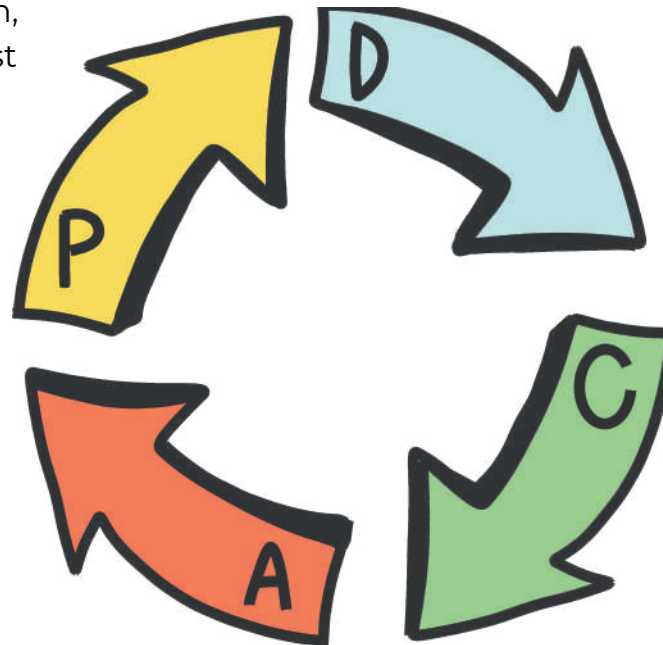
CONCEPT OF PDCA CYCLE

Plan

Starts with defining the problem or opportunity, analysing the situation, thinking creatively towards the best approach and developing an implementation plan

Do

Focuses on implementing corrective actions and using data gathering tools to collect information



Act

Involves making decisions based on the results obtained.

Check

Involves analysing information, monitoring trends and comparing obtained results

PDCA CYCLE ADAPTED FOR ALIGNMENT OF LEARNING OUTCOMES WITH TEACHING AND LEARNING ACTIVITIES AND ASSESSMENT

Plan

Define learning outcomes, design aligned teaching activities, choose appropriate assessments and set performance criteria. For example: in a design teaching activities, if a learning outcome involves critical thinking, design activities like debates, case studies or problem-solving exercises. In learning activities: for practical skills, hands-on labs, simulations or workshops may be more appropriate.

Act

Make improvements to teaching activities, assessments and overall alignment and prepare for the next cycle. For example, if a learning activity did not engage students as expected, consider alternative approaches that might be more effective and conduct in the next cycle.



Do

Implement the teaching and learning activities, conduct assessments and collect student feedback. The student feedback can be done through survey, or classroom assessments.

Check

Evaluate student performance and teaching effectiveness, identify gaps and analyze feedback. For example, if students did not perform well in a particular area, consider whether the teaching activities were adequate or if adjustments are needed.

WHEN TO CONDUCT CQI FOR ASSESSMENT OF LEARNING OUTCOMES?

CQI for CLO

CQI for course learning outcomes

CQI for CLOs is an ongoing process that should be conducted during the academic term (mid-semester) and at the end of academic semester.

CQI for PLO

CQI for programme learning outcomes

CQI for PLOs is a systematic process used to enhance the effectiveness of educational program. It should be conducted every year.

CQI for PEO

CQI for programme educational objectives

CQI for PEOs involves an ongoing process of evaluating and enhancing the long term goals and intended outcomes of an academic program following the CQI stages of 'plan', 'implement', 'monitor and review', and 'improve'. It should be conducted every 3-5 years. CQI for PEOs is discussed in the GTCD's playbook.

CQI FOR COURSE LEARNING OUTCOMES

- CLOs are elements of technical or soft skills that each student must acquire prior to the completion of a specific course or subject taught. Thus, CQI for course aims to improve the CLOs that have been outlined in the course syllabus.
- The CLOs have to be mapped with their respective summative assessment methods and CLO achievement should be shown in percentage

A sample of interpretation of score range for CQI requirement

Score Range (%)	Status	Interpretation
>60%	Fairly Good	CQI is necessary to target that the performance is excellent.
50%-60%	Fair	Consider to implement CQI
<50%	Poor	CQI is required

This threshold level can be adjusted by the HEIs and Faculty/Department according to the requirements of the programme or the expected achievement of the students.

CQI PROCESS FOR COURSE LEARNING OUTCOMES



Define and align CLOs

- Identify key learning outcomes
- Map CLOs to course content



Implement and monitor

- Deliver the course
- Administer Assessments
- Gather feedback



Evaluate and Analyze

- Analyse assessment data
- Identify strengths and weaknesses
- Conduct root cause analysis



Implement improvement

- Develop action plans
- Revise CLOs and assessments
- Enhance teaching strategies
- Prepare for the next cycle
- Follow the PDCA process

EXAMPLE : CQI FOR IMPROVEMENT IN CLO

CQI for Improvement of CLO1 in Power Electronic course

CLOs statement for the course 'Power Electronics'

CLOs	CLOs statement
1	At the end of the course, students are able to select the power electronics components and structures for suitable purposes.
2	At the end of the course, students are able Design a suitable and economical power electronics converter for requirement specification.
3	At the end of the course, students are able Develop effective communication skills of power electronics systems in scientific and non-scientific communities.

CLO1 assessment for 'Power Electronics' Course

Student ID	Student Name	Mark Criteria								Total		CLO 1 Pass/Fail	CLO1 Grade	CQI										
		Class Test #1		Class Test #2		Midterm		Final																
		CLO score (5%)	Pass/Fail	CLO score (5%)	Pass/Fail	CLO score (20%)	Pass/Fail	CLO score (20%)	Pass/Fail	Score Max. 50	Score Max. in (%)													
IDxxxA	Student A	0.00	Fail	0.65	Fail	6.80	Fail	12.80	Pass	20.25	41%	Fail	E											
IDxxxB	Student B	2.80	Pass	2.85	Pass	10.80	Pass	17.40	Pass	33.85	68%	Pass	C+											
IDxxxC	Student C	2.30	Fail	4.30	Pass	13.00	Pass	17.80	Pass	37.40	75%	Pass	B											
IDxxxD	Student D	2.35	Fail	4.30	Pass	13.60	Pass	14.00	Pass	34.25	69%	Pass	C+											
IDxxxE	Student E	4.30	Pass	2.85	Pass	15.60	Pass	15.60	Pass	38.35	77%	Pass	B											
IDxxxF	Student F	4.45	Pass	2.80	Pass	19.40	Pass	17.80	Pass	44.45	89%	Pass	A											
IDxxxG	Student G	4.45	Pass	3.35	Pass	13.40	Pass	15.80	Pass	37.00	74%	Pass	B											
IDxxxH	Student H	3.90	Pass	3.90	Pass	17.80	Pass	15.60	Pass	41.20	82%	Pass	B+											
IDxxxI	Student I	4.85	Pass	3.40	Pass	19.60	Pass	13.40	Pass	41.25	83%	Pass	B+											
The CLO for the course is considered as attained/achieved 'if 50% of students get 50% marks for the total CLOs'									Average score		36.44	# Fail	1	Avg. CLO Pass/Fail Condition	Avg. CLO Achievement									
									Average score (%)		72.9	# Pass	8											
																			Fail %		11%		50%	Yes
																			Pass %		89%			

FOUR STAGES IN CLO1 IMPROVEMENT USING PDCA

Maintain

The instructor continues to implement these effective strategies in subsequent semesters

Modify and repeat

If the improvement is not satisfied, the course instructor repeats the PDCA cycle.

Monitor and Collect Data

Monitor students progress through formative assessments (short quizzes) related to CLO1.

Analyze Results

Analyze the overall CLO1 attainment for the cohort, comparing it to the previous semester's data



Identify the Root Cause

- Reviewing Students Performance: Analyze individual student scores on assessments related to CLO1
- Identifying if the assessment methods (e.g., MCQs) effectively measure the intended depth of understanding and application for "basic knowledge" in CLO1

Develop a Corrective Action Plan

- Enhancing Teaching Materials
- Diversifying Learning Activities: e.g. group problem-solving sessions
- Providing Targeted Support (additional help sessions)
- Adjusting Assessment Weighting
- Applying in the next semester

Implement Corrective Actions

- The instructor puts the chosen plan into action
- Might involve utilizing a flipped classroom model
 - Active learning and problem-solving
 - Introduce peer-learning activities

CLO TOTAL MARKS ASSESSMENT IN POWER ELECTRONICS COURSE

- 1 89% of students pass CLOs with an average CLO attainment of 64.49%.
- 2 Implement CQI to improve CLOs, particularly CLO2 and CLO3
- 3 Identify the root cause and make suggestion for next semester
- 4 Put the chosen plan into action
- 5 Analyse assessment data before and after implementing corrective measures
- 6 Maintain or repeat the PDCA cycle according to instructor's judgement

Student ID	Student Name	CLO Marks			Total Max. 100	Subject Pass/Fail	Course Grade	CQI
		CL01 (50%)	CL02 (25%)	CL03 (25%)				
IDxxxA	Student A	20.25	4.90	0.00	25.15	Fail	F	
IDxxxB	Student B	33.85	9.05	9.80	52.70	Pass	C	
IDxxxC	Student C	37.40	12.25	12.35	62.00	Pass	C	
IDxxxD	Student D	34.25	12.40	14.55	61.20	Pass	C	
IDxxxE	Student E	38.35	16.15	19.50	74.00	Pass	B	
IDxxxF	Student F	44.45	19.00	17.50	80.95	Pass	B+	
IDxxxG	Student G	37.00	11.05	17.10	65.15	Pass	C+	
IDxxxH	Student H	41.20	18.15	16.65	76.00	Pass	B	
IDxxxI	Student I	41.25	20.20	21.80	83.25	Pass	B+	
Average score		36.44	13.68	14.36	64.49	# Fail	1	
Average score (%)		72.889	54.7333	57.4444	64.49	# Pass	8	
						Fail %	11%	
						Pass %	89%	

CQI PROCESSES FOR PROGRAMME LEARNING OUTCOMES



Define and align PLOs

- Establish program learning outcomes
- Map PLOs to courses



Implement and monitor

- Deliver the programme
- Administer assessments
- Gather continuous feedback



Evaluate and Analyze

- Analyse assessment data
- Identify gaps
- Conduct root cause analysis

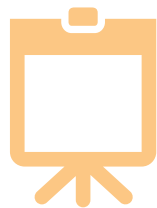


Implement improvement

- Develop action plans
- Revise PLOs and curriculum
- Enhance teaching and assessment methods
- Plan for the next CQI cycle
- Follow the PDCA process

ADDITIONAL SOURCES IN DETERMINING PLO ATTAINMENT

Apart from determining PLO attainment based on CLO attainment, there are several other sources that can be used to collect information to determine PLO attainment.



PLO attainment in this
playbook is inferred
from CLO attainment.

- Industrial survey
- Annual surveys
- Alumni panel
- Student self survey

EXAMPLE : CQI FOR IMPROVEMENT OF PROGRAMME LEARNING OUTCOMES

CQI for Improvement of PLO1 in EA Programme

Student ID	Student Name	PLO1 Score Report					
		CL01	PLO1 Total		Pass/Fail (50%)	PLO1 Grade	CQI
		Score Wiegth 50%	Score Max. 50	Score Max. in (%)			
Weight x Credit		50% x 3 = 1.5	1.5				
IDxxxA	Student A	20.25	20.25	41%	Fail	E	
IDxxxB	Student B	33.85	33.85	68%	Pass	C+	
IDxxxC	Student C	37.40	37.40	75%	Pass	B	
IDxxxD	Student D	34.25	34.25	69%	Pass	C+	
IDxxxE	Student E	38.35	38.35	77%	Pass	B	
IDxxxF	Student F	44.45	44.45	89%	Pass	A	
IDxxxG	Student G	37.00	37.00	74%	Pass	B	
IDxxxH	Student H	41.20	41.20	82%	Pass	B+	
IDxxxI	Student I	41.25	41.25	83%	Pass	B+	
	Average score		36.44	Fail	1	Avg. PLO Achieved Condition	Avg. PLO Achieved
	Average score (%)		72.89	Pass	8		
				Fail %	11%	50%	Yes
				Pass %	89%		

89% students passed PLO1 with an average total score is 72.89%.

Implement PDCA to maintain the effective strategies

or implement PDCA to increase the average PLO1 attainment to more than 89% in the following year.

EXAMPLE: PLOS ATTAINMENT OF EA PROGRAMME YEAR 4, SEMESTER 1

Semester PLOs Attainment - Semester 1 Year 4 EA Program (2022-2023)																						
Course ID	Course Name	Credit	PLO1		PLO2		PLO3		PLO4		PLO5		PLO6		PLO7		PLO8		PLO9		PLO10	
			CW*	Achieve (%)	CW*	Achieve (%)	CW*	Achieve (%)	CW*	Achieve (%)	CW*	Achieve (%)	CW*	Achieve (%)	CW*	Achieve (%)	CW*	Achieve (%)	CW*	Achieve (%)	CW*	Achieve (%)
GEEI41ENG	English V	1	0.45	79%											0.75	68%	0.8	68%				
GEEI41FRE	French VII	1	0.45	95%											0.85	87%	0.45	87%				
GEEI41PEL	Power Electronics	3	1.50	89%	0.30	44%	0.45	44%									0.75	67%				
GEEI41REM	Research Methodology	2	0.5	69%					1.3	47%	1.2	94%			1.7	68%						
GEEI41MOD	Motor drive	3	0.6	81%	0.9	81%	1.5	79%									1.35	77%				
GEEI41MCS	Modern control systems	3	0.75	69%			2.25	58%											2.4	79%	1.5	79%
GEEI41INP	Industrial network protocol	2	0.4	86%			1.5	62%											1.3	58%	0.9	58%
GEEI41SPP	Student project part I	1	0.3	44%			0.75	57%	0.65	23%									0.55	62%	0.85	62%
CW Total			4.25		1.2		4.2		1.3		1.2		0		3.3		3.35		4.25		3.25	
Average PLO Achievement			82%		72%		64%		47%		94%		x		73%		74%		70%		69%	
PLOs Attained (>50%)			Yes		Yes		Yes		No		Yes		x		Yes		Yes		Yes		Yes	
CQI																						
*CW (Credit Weight) = Weight x Credit																						

*CW (Credit Weight) = Weight x Credit

1

Identify courses that had contributed to PLO4

2

Check the CLOs that were mapped to this PLO4

3

Implement PDCA

4

Check the results after implementing the revised action

5

If PLO4 is attained, implement PDCA to maintain effectiveness and if the results are not as expected, repeat the PDCA

6

Document the evidence and revise the plan

EXAMPLE: ANNUAL PLO ATTAINMENT IN YEAR 4

A PLO is achieved if number of student who passed the PLO is equal or greater than achievement condition. CQI is conducted to improve or maintain the achievement of each PLO.



Scan here to access the example of
Year 4 Annual PLOs Attainment



All PLOs are attained; however the average PLO achievement of PLO4 and PLO10 is still low compared to other PLOs.



The program coordinator has to check how many courses contribute to PLO4 and PLO10, then take actions to improve students' performance in those courses.

EXAMPLE : PLO ATTAINMENT AT END OF PROGRAMME



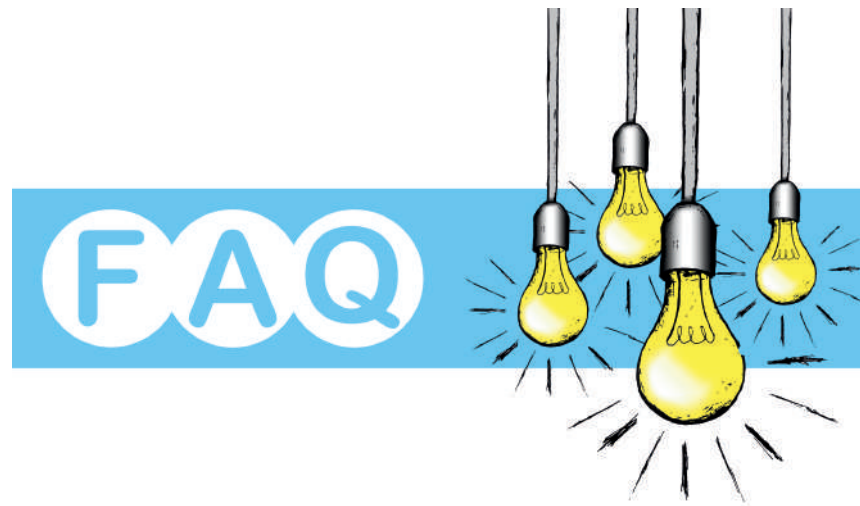
Scan here to access
the example

The process is the same for end of programme PLOs attainment.

Check whether there are any PLOs which were not attained

Implement PDCA to maintain the good performance if the PLOs are attained and repeated in cases that the PLOs are not attained

**What are
frequently
asked
questions
related to
Holistic
Assessment?**



1. What makes assessment holistic?

It is holistic when various assessment techniques are used to comprehensively assess students' learning outcomes that course intends to achieve in terms of knowledge, skills and attitudes. It integrates various learning outcomes, assessment techniques, and tools to ensure alignment with course learning outcomes (CLOs) and programme learning outcomes (PLOs).



2. What are differences between authentic assessment, innovative assessment, alternative assessment and integrated assessment?



The four approaches are authentic in nature because students are engaged in real context or scenarios, but they have their own uniqueness in terms of assessment techniques, assessment tasks, assessment tools and disciplines.

What are differences between analytic rubric and holistic rubric?

- **Analytic Rubrics:** Break down performance into multiple criteria, each scored separately, providing detailed feedback (**sample in page 61**).

Holistic Rubrics: Assess overall performance using combined descriptors, focusing on general quality without breaking it down into components (**sample in page 61**).



What is the purpose of a PLO Attainment Report?

The PLO Attainment Report evaluates the extent to which students in a programme achieve the Programme Learning Outcomes (PLOs). It provides insights into programme effectiveness, identifies gaps in student performance, and informs curriculum improvements.

Can a single course contribute to more than one PLOs?

Yes, a single course can contribute to more than one PLOs if its CLOs are mapped to various programme-level outcomes. For example, a project-based course might address problem-solving (PLO2), teamwork (PLO4), and communication skills (PLO8).



What is the relationship between CLO Achievement and PLO Attainment?

CLO Achievement forms the foundation of PLO Attainment. Each CLO contributes to specific PLOs, and student performance in achieving CLOs is aggregated to determine PLO attainment across courses.



What challenges might arise when preparing a PLO Attainment Report?

- Lack of consistent mapping between CLOs and PLOs.
- Missing or incomplete student performance data.
- Difficulty in aligning assessments across different courses to the same PLOs.

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