



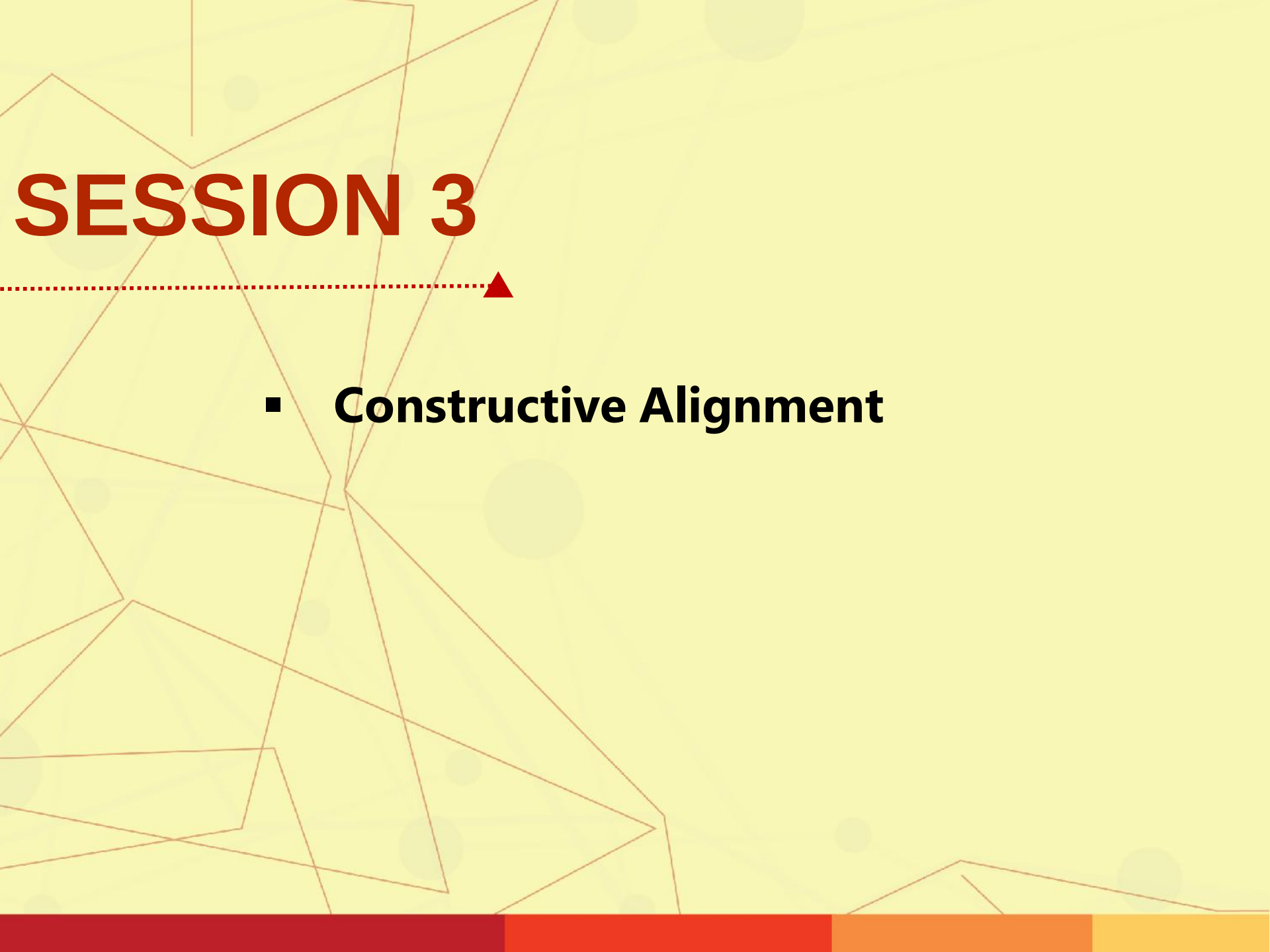
# **UTEM Workshop**

## **24-25 Apr 2019**

**Law Chung Lim**

Accreditation Department, Board of Engineers Malaysia

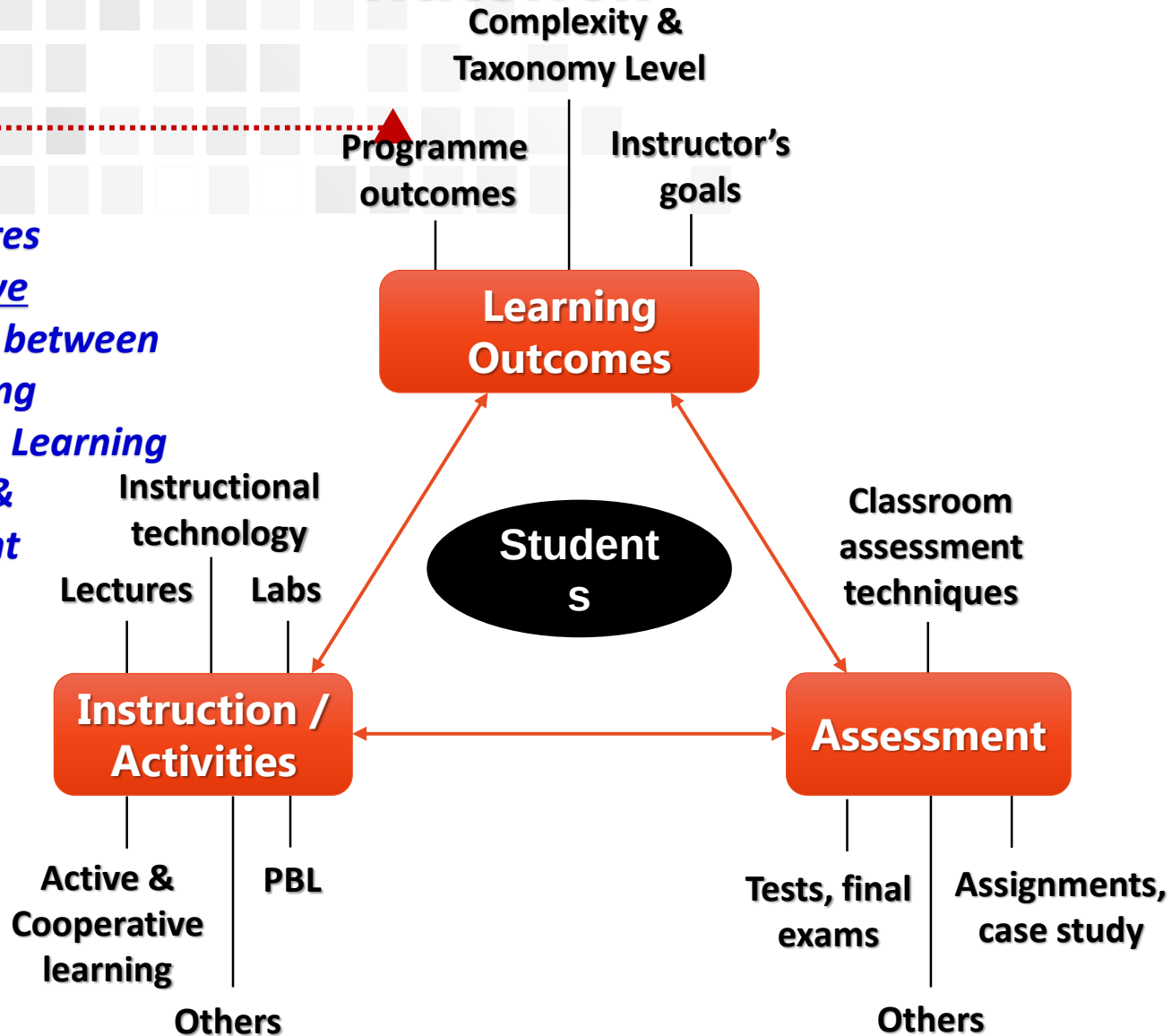
# SESSION 3

The background of the slide is a light yellow color. It features a complex network of thin, dark red lines that form various geometric shapes, including triangles and polygons. Some of these lines are solid, while others are dotted. There are also several light gray circles of different sizes scattered across the background. At the bottom of the slide, there is a horizontal bar composed of four colored segments: dark red, red, orange, and yellow.

- **Constructive Alignment**

# Constructive Alignment .. in the nutshell

*OBE requires  
constructive  
alignment between  
the Learning  
Outcomes, Learning  
Activities &  
Assessment*



# What is constructive alignment?

“A good teaching system aligns teaching method and assessment to the learning activities stated in the objectives, so that all aspects of this system are in accord in supporting appropriate student learning. This system is called *constructive alignment*, based as it is on the twin principles of constructivism in learning and alignment in teaching.”

John Biggs (1999)

# What is constructive alignment?

- the overall process of learning is built on a framework of curriculum design in which intended learning outcomes, teaching methods, assessment and evaluation are all inter-dependant and only by truly integrating these components together, do we get efficient student learning.

John Biggs (2003)

# CONSTRUCTIVE ALIGNMENT

## The Intended Learning Outcomes of the Curriculum

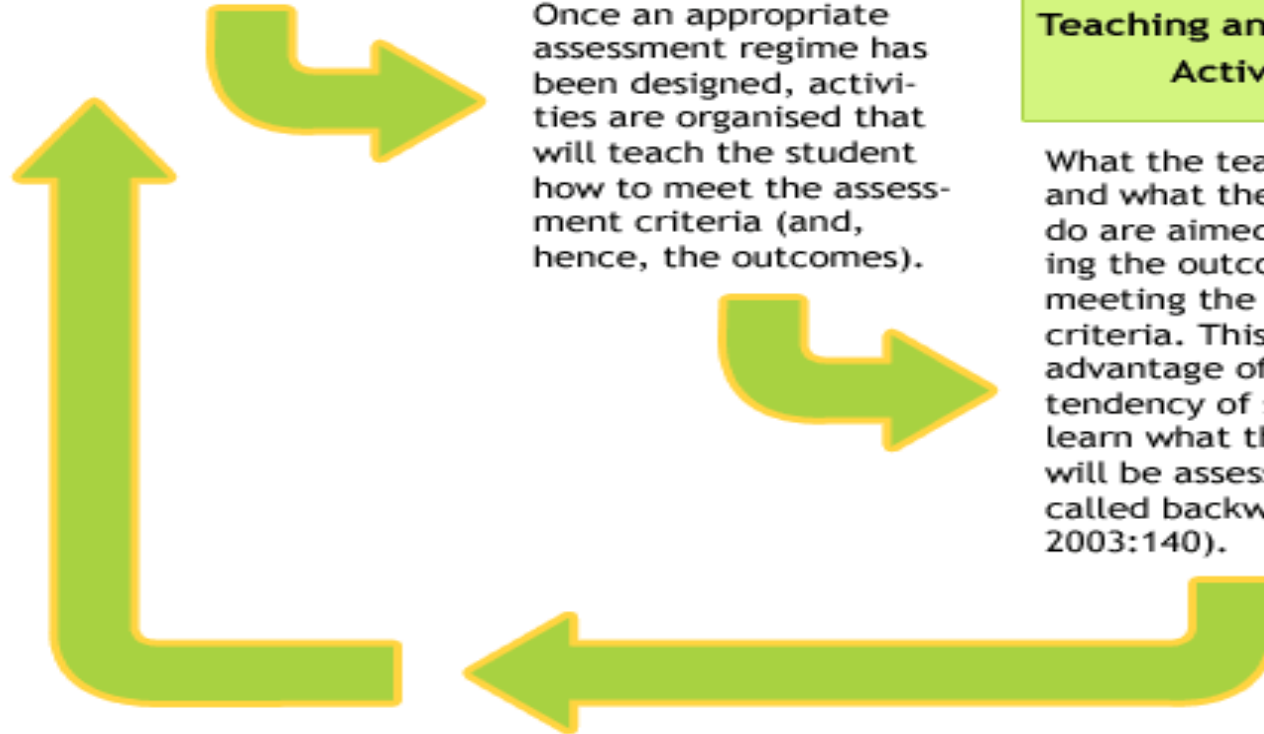
The outcomes are formulated first. From these the assessment criteria are developed.

## The Assessment Regime

Once an appropriate assessment regime has been designed, activities are organised that will teach the student how to meet the assessment criteria (and, hence, the outcomes).

## Teaching and Learning Activities

What the teacher does and what the students do are aimed at achieving the outcomes by meeting the assessment criteria. This takes advantage of the known tendency of students to learn what they think will be assessed - and is called backwash (Biggs 2003:140).





| Domain of Learning Outcomes | Learning Methods                                                          | Assessment Methods                                        |
|-----------------------------|---------------------------------------------------------------------------|-----------------------------------------------------------|
| Cognitive                   | Lecture, Tutorial, Self-directed Learning, SCL type like PBL, POBPL, etc. | Oral or written examination, viva, report, log book, etc. |
| Psychomotor                 | Practical work, laboratory experiment, lecture, demonstrations, etc       | Observation through practical work                        |
| Affective                   | SCL activities like group discussion, PBL, POPBL, etc                     | Observation and/or Cognitive typed Assessment             |

| Possible L.T.As                                                                                                                                                                                                         | Common ILOs    | Possible Assessment Tools                                                                                                                                               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Set reading, lecture, report on field trip, write essay                                                                                                                                                                 | Describe       | Assignment, essay question exam                                                                                                                                         |
| Tutorial, activities, write essay                                                                                                                                                                                       | Explain        | Assignment, essay question exam, oral presentation                                                                                                                      |
| Project, assignment                                                                                                                                                                                                     | Integrate      | Project, assignment                                                                                                                                                     |
| Project, case study                                                                                                                                                                                                     | Apply          | Project, case study, experiment                                                                                                                                         |
| PBL, case study                                                                                                                                                                                                         | Solve problem  | Case study, project, experiment                                                                                                                                         |
| Project, poster                                                                                                                                                                                                         | Design, create | Project, experiment, poster                                                                                                                                             |
| Reflective diary                                                                                                                                                                                                        | Reflect        | Reflective diary, portfolio, self-assessment                                                                                                                            |
| presentation, debate, role play,                                                                                                                                                                                        | Communicate    | A range of oral, writing or listening tasks addressing the ILOs, e.g. presentation, debate, role play, reporting, assignment, précis, paraphrasing, answering questions |
| <p><i>The point is not how you are going to teach but how and what you want your students to learn.</i></p> <p><i>NOTE! Many of these TLAs can be assessments tasks as well. Then you have excellent alignment.</i></p> |                |                                                                                                                                                                         |



# Constructive Alignment (CA)

| CLO                                                                                                                                                   | Teaching methods                                                                                | Type of assessment                                                             |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| <i>By the end of the course, students are be able to <u>describe</u> asepsis technique used in nursing to prevent infection.</i><br>(C2,P1,PLO1,PLO2) | C -<br>Lecture/ Tutorial / Group Discussion<br><br>P -<br>Demonstration/ Practical / Skills Lab | c2 -<br>Test (MCQ or short answer)/ Assignments<br><br>p1 –<br>Practical tests |

|        | PLO1 | PLO2 | PLO3 | PLO4 | PLO5 | PLO6 | PLO7 | PLO8 | PLO9 |
|--------|------|------|------|------|------|------|------|------|------|
| COURSE | √    | √    |      |      |      |      |      |      |      |

*What is the concept of CA?*

*CA is aligning one's COs to the Teaching Learning Activities (TLAs) and the Assessment Tasks (ATs)*

# How CA looks like in OBE Document

| Course Learning Outcomes (CO)                                                                                                                           | Program Outcomes (PO) |     |     |     |     |     |     |     |     | Methods of delivery               | Assessment                                   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----------------------------------|----------------------------------------------|
|                                                                                                                                                         | PO1                   | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 |                                   |                                              |
| Identify and differentiate the different types of soil and their properties and classify soil using British and / or Unified Soil Classification System | ✓                     | ✓   |     |     |     |     |     |     |     | Lecture and laboratory work       | Short test and laboratory work/report        |
| Conduct laboratory tests for determination of soil index and compaction                                                                                 | ✓                     | ✓   |     |     | ✓   |     |     |     |     | Demonstration and laboratory work | Direct observation on laboratory work/report |
| Solve calculation problem using mechanics involving physical properties, compaction, seepage and effective stress                                       | ✓                     | ✓   |     |     |     |     |     |     |     | Lecture and calculation activity  | Examination and graded calculation activity  |

# CO & PO Mapping

*Consider the following mapping examples.*

| CO  | Assess<br>ment<br>(As) * | PO1 | PO2 | PO3 | .....<br>. | PO9 | PO10 | PO11 | PO12 |
|-----|--------------------------|-----|-----|-----|------------|-----|------|------|------|
| CO1 | As-1                     | √   |     |     |            |     |      |      |      |
| CO2 | As-2                     |     | √   |     |            |     |      |      |      |
| CO3 | As-3                     |     |     | √   |            |     |      |      |      |
| CO4 | As-4                     |     |     |     |            | √   |      |      |      |
| CO5 | As-5                     |     |     |     |            |     |      |      | √    |

\* As-1, As-2, etc, – refers to **different type of assessment**

***Question: Is CO and PO aligned to the assessment?***

***Answer: **Yes !** ..... this is a clear example of direct alignment, i.e. 1 CO to 1 PO using 1 Assessment!***

# CO & PO Mapping

*Is the CO-PO constructively assessed?*

| CO  | Assessment (As) * | PO1 | PO2 | PO3 | ..... | PO9 | PO10 | PO11 | PO12 |
|-----|-------------------|-----|-----|-----|-------|-----|------|------|------|
| CO1 | As-1              | √   | √   |     |       |     | √    |      |      |
| CO2 | As-2              |     | √   |     |       |     |      |      | √    |
| CO3 | As-1              |     |     | √   |       |     |      |      |      |
| CO4 | As-3              |     |     |     |       | √   |      |      |      |
| CO5 | As-4              |     |     |     |       |     |      |      | √    |

\* As-1, As-2, etc, – refers to **different type of assessment**

**Answer: No ! .....** (1) we have CO1 map to PO1, PO2 & PO10 but using the same assessment (AS-1) to measure all three POs.

(2) the same assessment (As-1) is used to measure 2 or more COs (i.e. CO1 & CO3)

# CO & PO Mapping

*Is the CO-PO constructively assessed?*

| CO  | Assessment                                  | Description                                                                                                                                                                 | PO1 Knowledge | PO2 Prob. Analy. | PO4 Investigation | PO8 Ethics |
|-----|---------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|------------------|-------------------|------------|
| CO1 | <b>Test 1</b><br><br><b>Final Exam (Q1)</b> | Analyze the kinetics of a particle or a system of particles using Newton's 2 <sup>nd</sup> Law, the Principle of Work and Energy, and the Principle of Impulse and Momentum |               | ✓                |                   | ✓          |
| CO2 | Final Exam (Q2) / Assignment                | Investigate rigid-body kinetics using Newton's 2 <sup>nd</sup> Law and the Principle of Work and Energy                                                                     |               |                  | ✓                 |            |

**Ans: No ! .....** CO1 is map to PO2 & PO8, but looking at the outcome statement, it may be the case that the CO has no connection with PO8 (Ethics) and the assessment may also be not appropriate!

# PO ATTAINMENT REPORT

*What can you deduced from the results?*

| Cours<br>es    | PO<br>1 | PO<br>2 | PO<br>3 | PO<br>4 | PO<br>5 | PO<br>6 | PO<br>7 | PO<br>8 | PO<br>9 | PO<br>10 | PO<br>11 | PO<br>12 |
|----------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------|----------|----------|
| FYP            | 90<br>% | 90<br>% | 90<br>% | 90<br>% | 90<br>% | 90<br>% | 90<br>% | 90<br>% | 90<br>% | 90%      | 90<br>%  | 90<br>%  |
| IDP            | 70<br>% | 70<br>% | 70<br>% | 70<br>% | 70<br>% | 80<br>% |         |         | 80<br>% | 80%      |          |          |
| Static<br>s    | 77<br>% | 77<br>% | 77<br>% | 66<br>% | 66<br>% |         |         |         | 55<br>% |          |          | 55<br>%  |
| Struct<br>ures | 67<br>% | 88<br>% | 70<br>% | 88<br>% |         |         |         |         |         |          |          |          |
| EIS            |         |         |         |         |         | 79<br>% | 69<br>% | 80<br>% | 88<br>% |          |          |          |
| Proj<br>Magt   |         |         |         |         |         |         |         |         |         | 72%      | 86<br>%  | 74<br>%  |

# OUTCOMES ....

## ⦿ Each Outcomes are NOT the SAME

!

- Have **specific attributes** to be measured
  - Must have **SPECIFIC measurement method**

## ⦿ Assessment Plan for each POs should be CLEARLY ALIGNED

- Must be practical and relevant to the measured PO
- Use of appropriate rubrics (where applicable) to measure the intended depth of the outcomes e.g. complex problem



# Performance Indicator (PI) for CO & PO

- To do CQI, we need to have a **Performance Indicator (PI)**. It is the threshold limit that indicates that the class have achieved a specific outcomes.
- Sample PI used by IHLs:
  1. **50%** of the class getting > **50% score**
  2. **50%** of the class getting > **60% score** + **70%** of the class getting > **40%**
  3. **70%** of the class getting > **55% score**
  4. **100%** of the class getting > **40% score**
  5. **Class average** > **50% score**
- The choice of PI would determine the **extent and effectiveness** of CQI that will perform at the course & programme level!



Thank you