# OBE Model for Engineering

IIEE Annual National Convention

Academe Forum

DR. GIL B. BARTE, PECE

Program Evaluator (BS ECE)

Register of Program Evaluators (RPEv)

Philippine Technological Council (PTC)

## Your Speaker:

# Engr. Gil B. Barte, Ph.D., PECE

- Governor, IECEP – Batangas Chapter
- Program Evaluator (BS ECE) – PTC Register of Program Evaluators (RPEv)
- Associate Dean

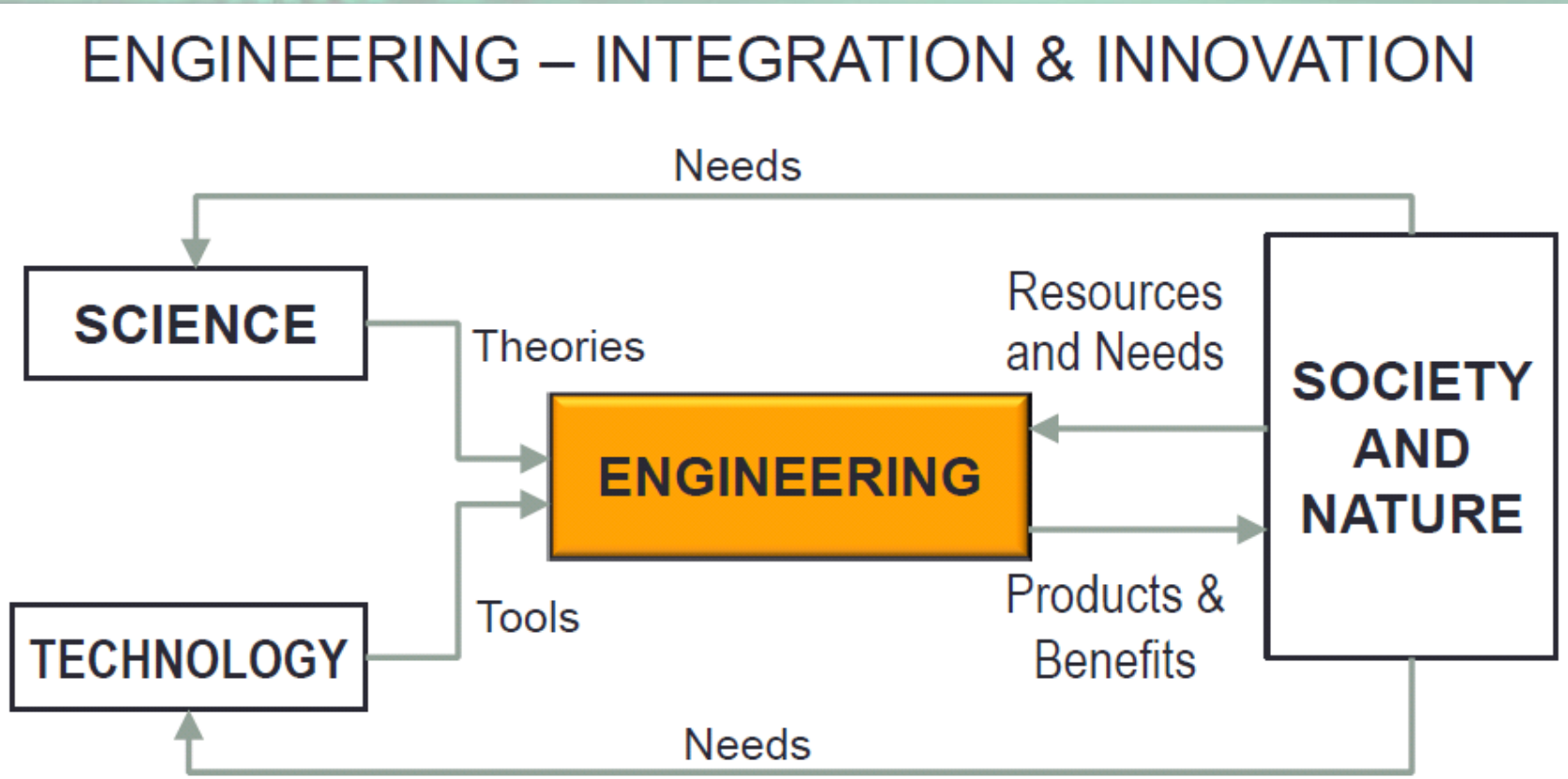
  College of Engineering, Architecture and Fine Arts

  Batangas State University (BatSU)
- Faculty, ECE/ICE/MeXE Department (BatSU)
- Former faculty - KDU College (Malaysia) under their Deakin University (Australia) and Northumbria University (UK) twinning program.

# Topic Outline

- CONTEXT OF ENGINEERING PRACTICE AND EDUCATION
- QA Statutory Basis:
  - Philippine Quality Framework (PQF)
  - CMO 37, 46, series 2012
- OUTCOMES-BASED EDUCATION IN ENGINEERING
- OUTCOMES BASED ACCREDITATION
  - PHILIPPINE TECHNOLOGICAL COUNCIL
  - Role of APOs
  - Roles of HEIs

# Engineering




Source: Unesco Report on Engineering, Nov 2010

# Changing Realities in Engineering



## FIVE COMPETITIVE FORCES IMPACTING PROFESSIONAL PRACTICE & EDUCATION*

### THREATS OF GLOBALIZATION/MRAs

(COMPETITION) Local Practice BUT of Global Standards, Cross Border Practice

### EDUCATIONAL INSTITUTIONS

(SUPPLIERS)

- Quality vs. Quantity
- Traditional Education vs. "OBE"
- Technico-Economic Viability – Profitability


### INDUSTRIES/ COMMUNITIES

(SERVICE CUSTOMERS)

- Growth - Vertical & Horizontal
- Value Recognition
- High Speed Technological Changes
- Complex & Multiple Constraints Considerations
- Transnational Range of Issues
- Beyond Traditional Knowledge & Skills

### OTHER PROFESSIONS

(ALTERNATIVE SERVICES)

- Substitute Services (e.g. Robots) and
- Shift of Profession

# Problem :Nurturing Quality in Education

***Assessment***

***Delivery***

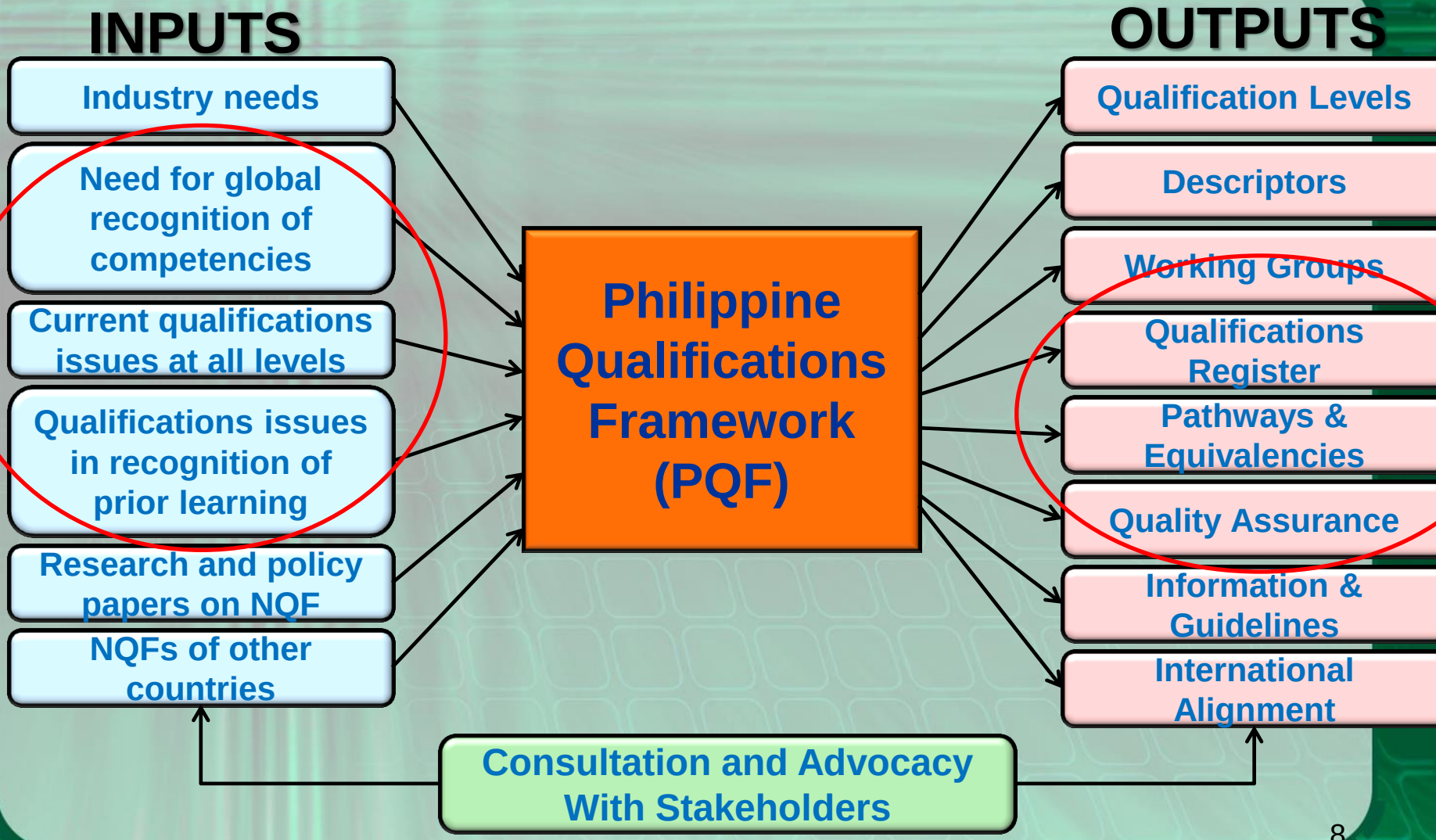
***Design***

# Quality Assurance Basis: (1)

- Philippines Qualifications Framework (2011)

**- INSTITUTIONALIZATION OF THE PHILIPPINE QUALIFICATIONS FRAMEWORK**

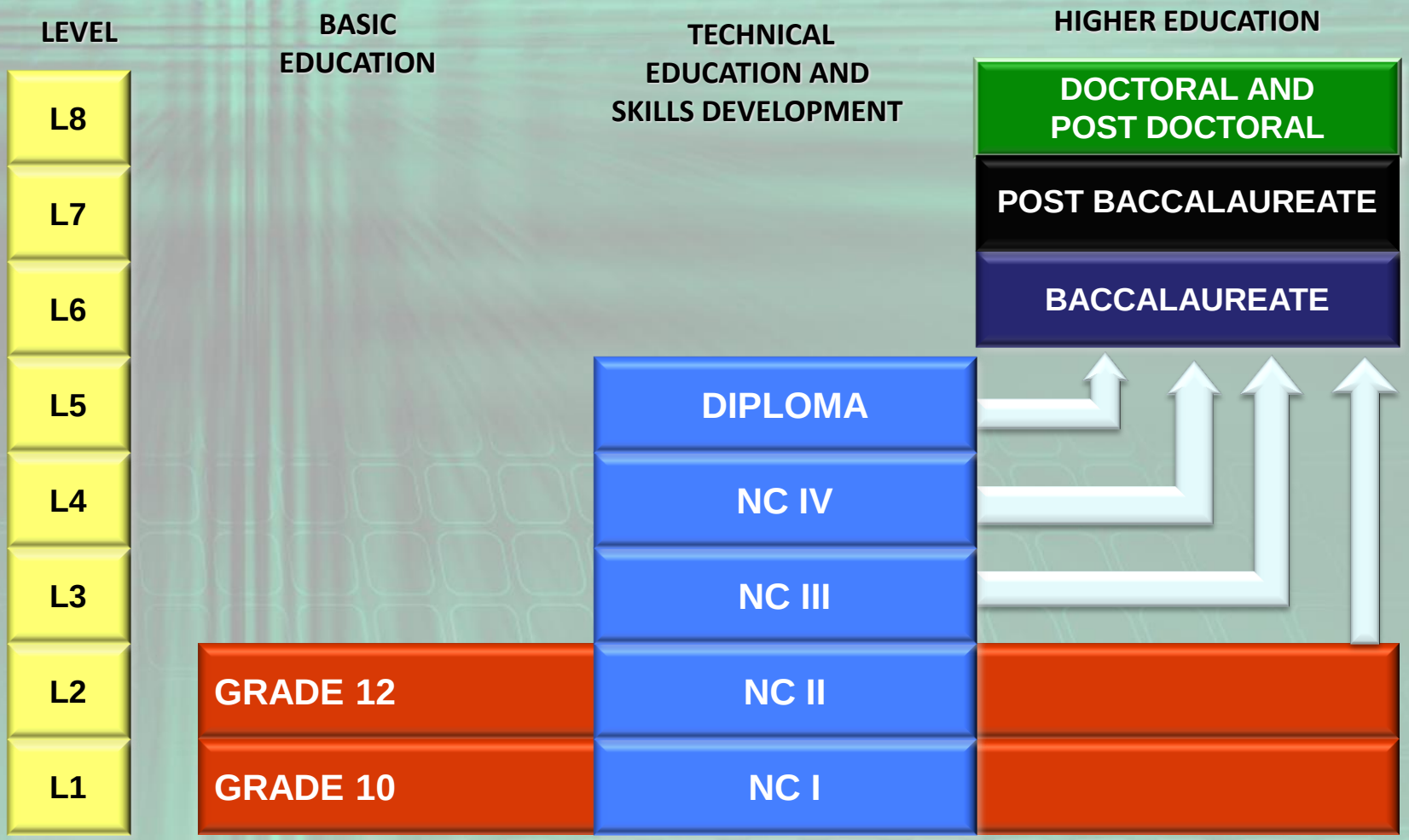
## Executive Order No. 83



# The PQF Coverage

- Basic Education
- Technical and Vocational Education
- Higher Education

# THE PHL QUALIFICATIONS FRAMEWORK



# Quality Assurance Basis: (2)

## CMO 46, series 2012

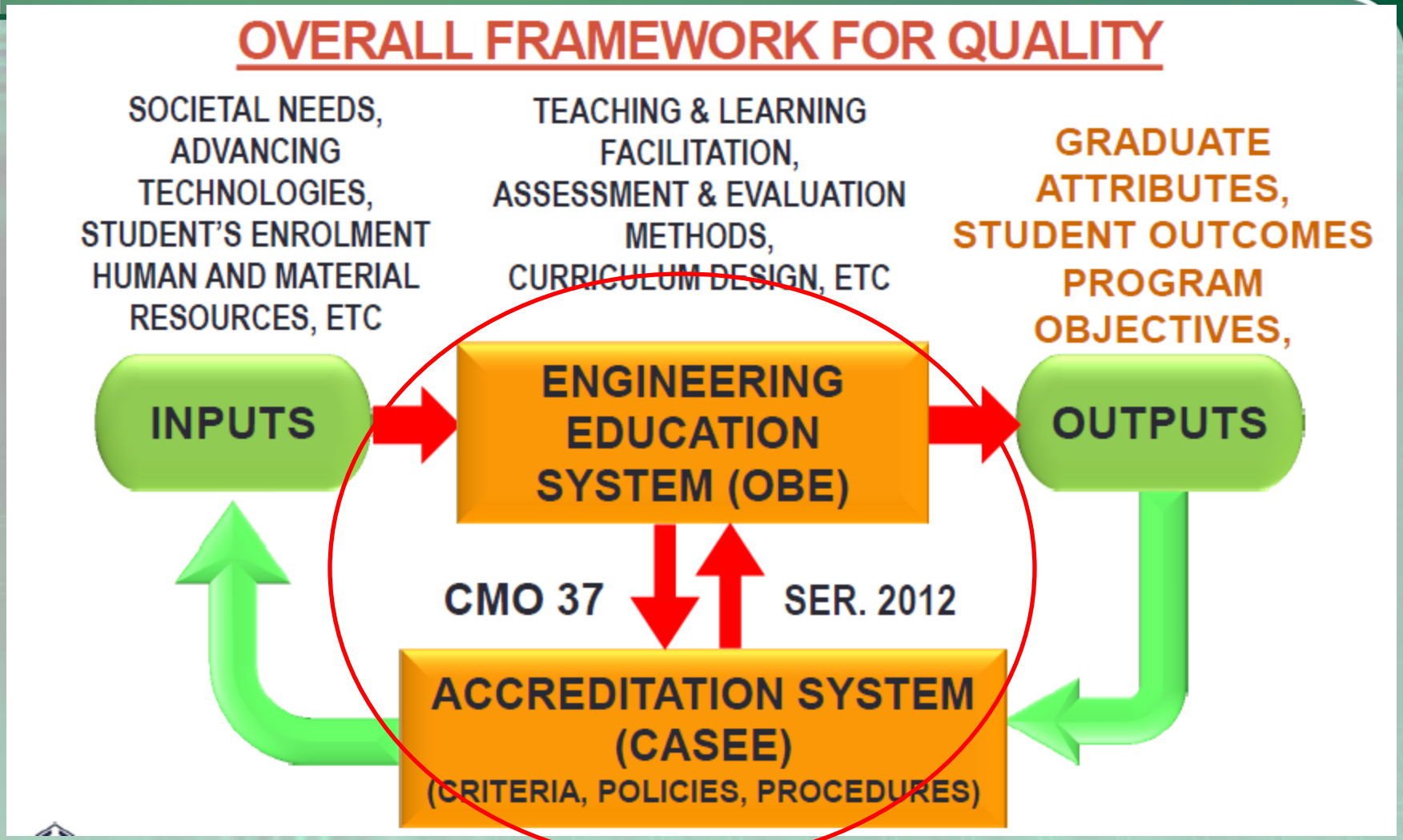
- "Policy-Standard to Enhance Quality Assurance (QA) in Philippine Higher Education through an **Outcomes-Based and Typology-Based QA"**
- discussed the role of the state in providing quality education to its citizens.
- It also discussed how quality in higher education has been defined in different ways, often as "excellence" or "fitness for purpose", but also as "transformation" of stakeholders, especially for mature institutions.
- HANDBOOK ON TYPOLOGY, OUTCOMES-BASED EDUCATION, AND INSTITUTIONAL SUSTAINABILITY ASSESSMENT – PDF *CHED Handbook on Typology, OBE, and ISA (downloadable)*

# Quality Assurance Basis: (3)

## CMO 37, series 2012

- "Policies, Standard and Guidelines in the Establishment of outcomes-based education (OBE) system in Higher Education Institutions offering Engineering Programs"
- discussed the mandate to HEIs providing engineering educations to **adopt the OBE systems by the end of AY 2016 – 2017.**
- It also discussed the role of the **Philippine Technological Council (PTC)** as the **sole country representative** of all engineering professional organization (APOs) for Quality Assurance (QA) to t**he Washington Accord.**

# PTC Framework for QA

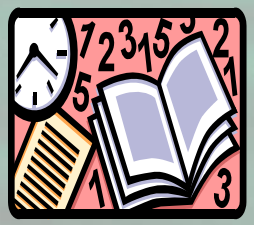


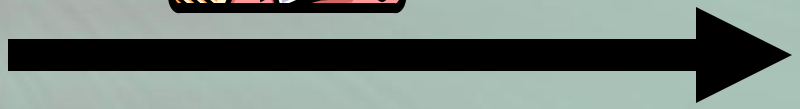
# OBE at GLANCE

# Background: OBE

- OBE has its origin in the USA in the 1980s
- Medical Profession was the first to adopt OBE.

# Academic Quality Assurance





outcomes ?

Do our activities contribute towards the development of effective Graduates (outcomes)?

# In the beginning ……

## Teacher Centered Approach (TCL)

**Some of its characteristics are:**

1. Knowledge is transmitted in 1 direction, from teacher to student.
2. Students passively receive information.
3. Teaching and assessing are separate and by topic.
4. Culture is competitive and individualistic.

**Criticism of TCL**

- Effective for ‘good’ students only.
- Not suited for non-auditory students.
- Environment is threatening/competitive

# Paradigm Shift

- From Teacher-centered (TCL)
  to Student-centered (SCL).

- What is SCL?
  1. Student constructs the knowledge
  2. Student is actively involved
  3. Cooperative / supportive environment

- Outcomes

  - SCL necessitates a focus on outcomes

  - what can students do?

# Outcome-Based Education

What is it all about?

# Outcome-Based Education

It is a method of curriculum design and teaching
that focuses on
learning outcomes,

The focus is on …
**what students can actually do**
**after they are taught.**

# What are Learning Outcomes (LO)

- Statements that specify what learners **know or are able to do** as a **result of a learning activity**.

- LO are usually expressed as knowledge (cognitive), skills (psychomotor), or behavior (aptitude).

- For example:
  - "The student is able to perform the Gangnam style dance."
  - "The student is able to explain Einstein's Theory of Relativity."

# Learning outcomes is first

- All 4 issues are focused on learning outcomes
- Desired outcomes are selected first
  - This is the opposite of traditional approach

LEARNING OUTCOMES

LEARNING OUTCOMES

Learning outcomes

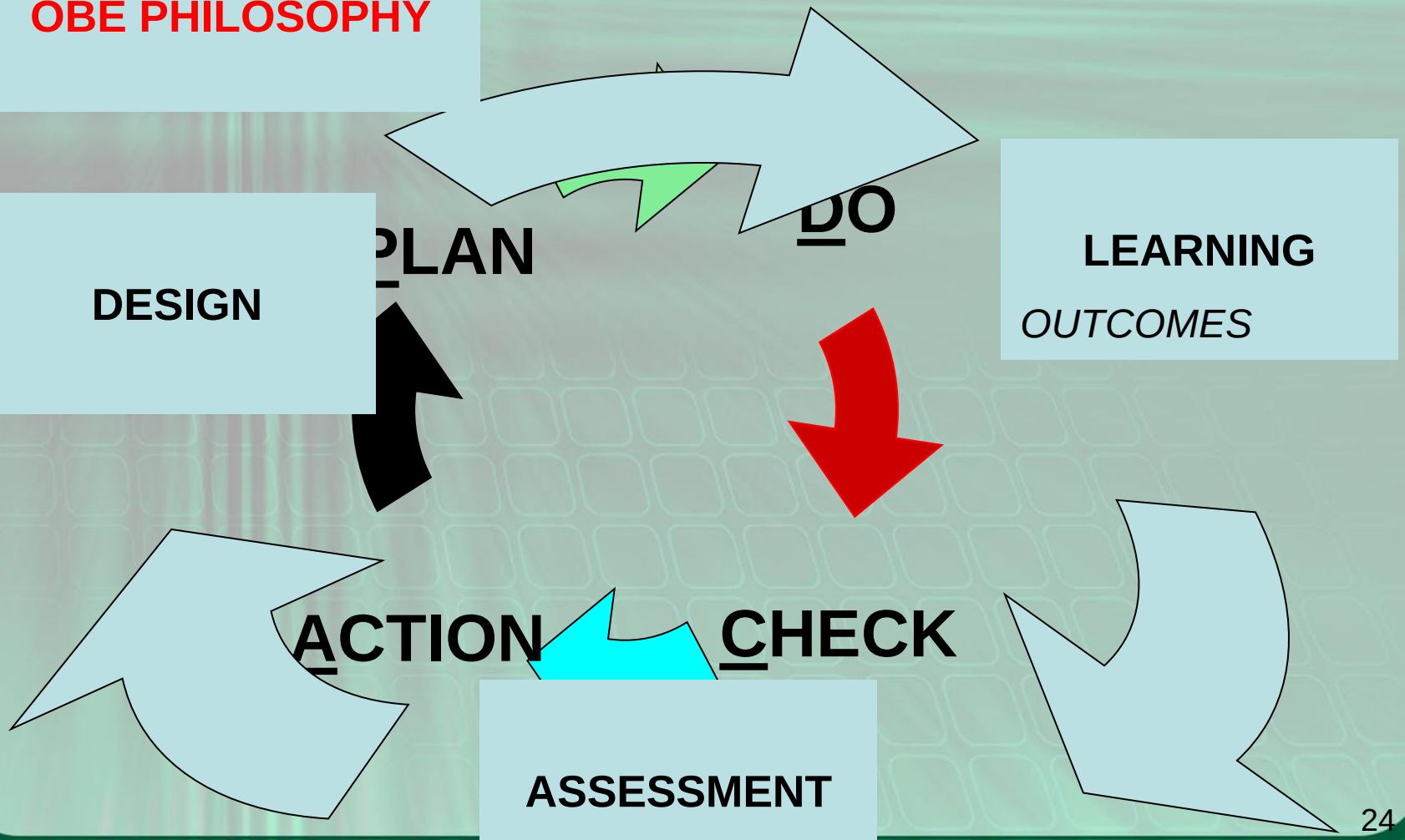
Learning Outcomes

# Why OBE?

- Paradigm shift towards SCL
- Marketable graduates (generic skills)
  - Useable knowledge and skills
  - Personality and attitude
  - Communications skills
  - Problem-solving skills and Critical-thinking
  - Information Processing skills and lifelong learning
  - Ethics and professionalism
  - Managerial and entrepreneurship
- Accreditation requirements

# OBE PLANNING & STRATEGIES

**OBE PHILOSOPHY**




**DESIGN**

**LEARNING**

*OUTCOMES*

**ASSESSMENT**

# Outcome-based Education

## 4 Essential principles of OBE:

1. **Clarity of focus**
2. **Mapping back**
3. **Student-centered**
4. **CQI**

- Always have significant and clear outcomes as the focus.

- Let the students know what they are aiming for.

# Outcome-based Education

## 4 Essential principles of OBE:

1. **Clarity of focus**
2. **Mapping back**
3. **Student-centered**
4. **CQI**

•Design curriculum backward by using major outcomes as the focus.

• Link all planning, teaching, and assessment decisions directly to these outcomes.

# Outcome-based Education

## 4 Essential principles of OBE:

1. **Clarity of focus**
2. **Mapping back**
3. **Student-centered**
4. **CQI**

- Increase the use of active-learning methods.
- Engage the students in their learning.

# Outcome-based Education

4 Essential principles of OBE:

1. **Clarity of focus**
2. **Mapping back**
3. **Student-centered**
4. **CQI**

- Evaluate the assessment results.
- Act upon the findings to improve.

# OBE – 4 key issues

| Key Questions | Stages |
|---|---|
| What are the outcomes we want students to have? | Planning |
| How to help them achieve those outcomes? | Delivery |
| How do we know when they have achieved those outcomes? | Assessment |
| How to close the loop? | Evaluation / CQI |

# So, to the first issue of OBE

**What outcomes should the students have?**

# What does it mean for HEIs?

Lectures

TUTORIALS

PROGRAMMES

Lectures

Courses

Labs

Courses

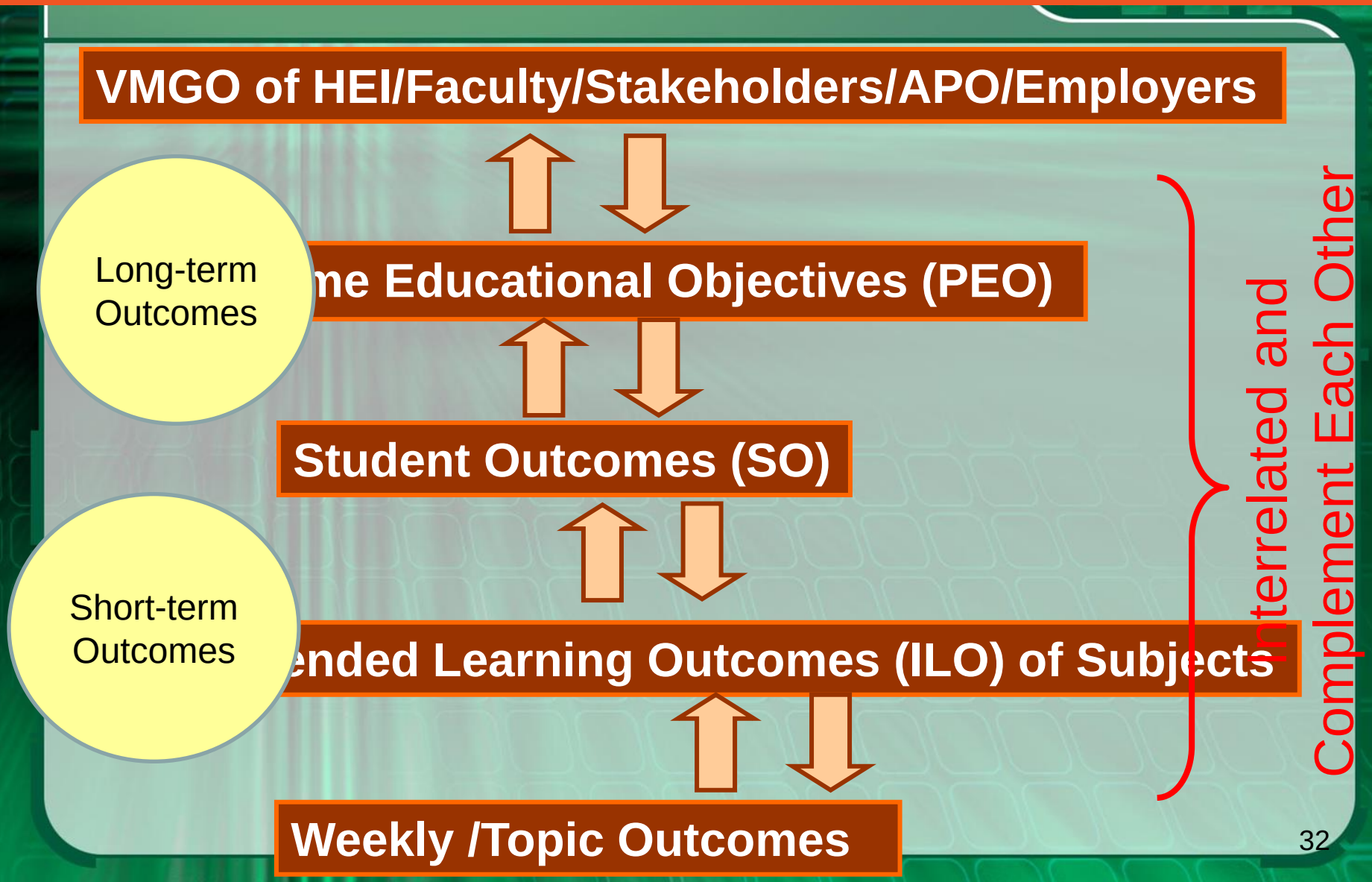
Practicals

Programme

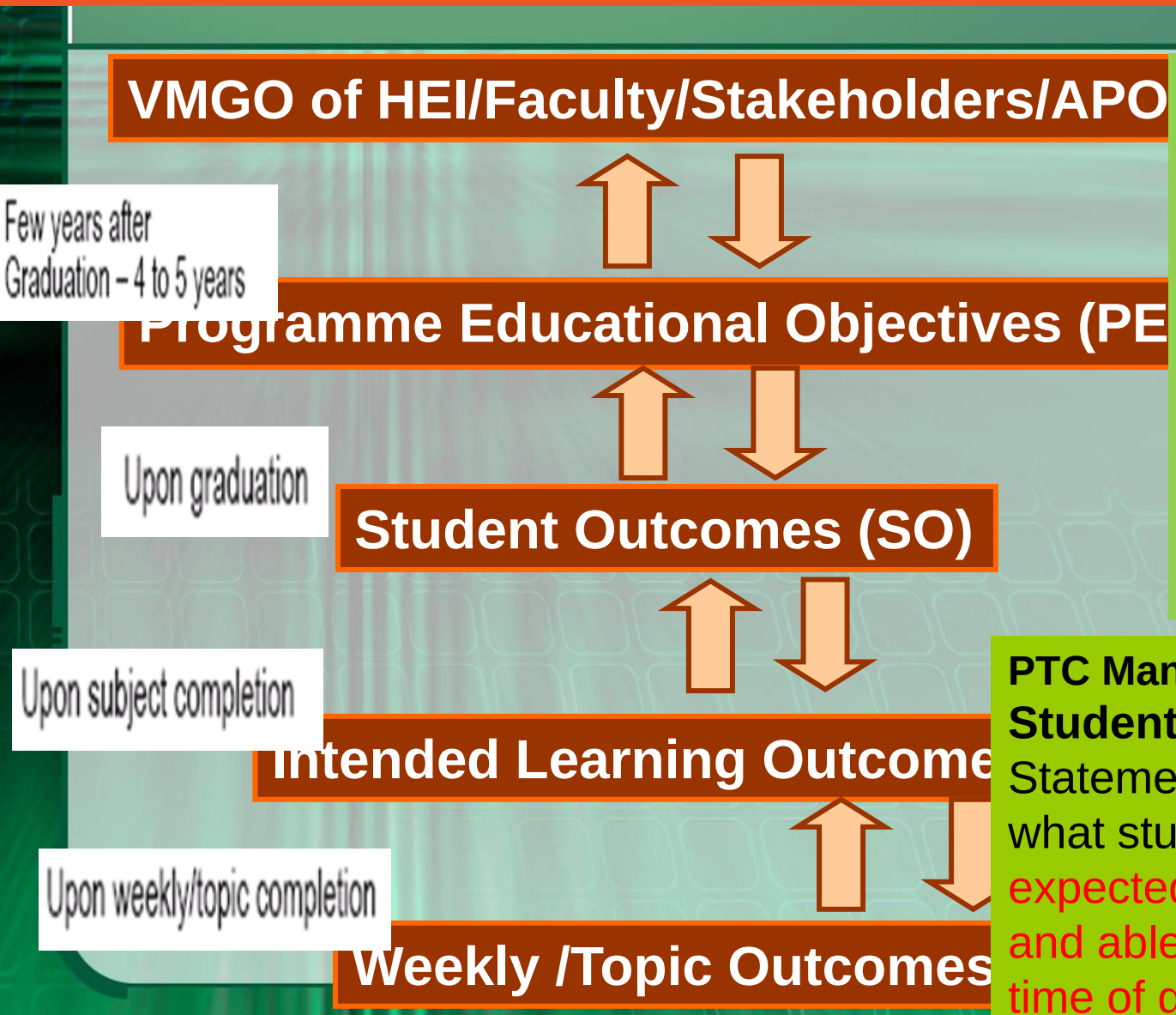
LABS

Courses

# A Model Hierarchy of Outcomes



# A Model Hierarchy of Outcomes




**PT Manual**
**Programme Educational Objectives** – PEO are broad goals describing expected achievements of graduates in their career and professional life after graduation (3 – 5 years after graduation).

**PTC Manual**
**Student Outcomes** - Statements that describe what students are expected to **know**, **think**, and able to **do** by the time of graduation.

# PEO

- Programme Educational Objectives (PEO)

- The outcomes achievable about 3-5 years after graduation?
- Example:
  - Will exhibit leadership skills in managing a small team of programmers.
- Why bother with PEO?
  - so many external factors.

- Example:

  - Art/Design students graduated and achieved the PO?
  - 5 years later, they're all mostly working as accountants
    - » Programme not achieving its objectives
    - » Wrong content in programme?
    - » No demand for artist/designers?

# Student Outcome level

- What outcomes should the students have upon completion of the programme (ECE, EE, ME, etc.)?
- Student Outcomes (SO)
- How to create/determine these student outcomes?
  - Stakeholders' requirements / industrial needs
  - Faculty expertise
  - CHED Memorandum Order (CMO) requirements
  - Professional body requirements
  - Vision & Mission of IHL
- 8 to 12 Student outcomes – as suggested by Philippine Technological Council (PTC)- the sole accrediting umbrella organization

a) CMO b) External Stakeholders' needs
c) Professional Bodies d) Faculty Expertise e) Vision & Missions

Student Outcomes
(upon graduation)

# The 12 Student Outcomes as prescribed by the PTC criteria.(1)

**These are:**

a) ability to apply knowledge of mathematics and science to solve engineering problems

b) ability to design and conduct experiments, as well as to analyze and interpret data

c) ability to design a system, component, or process to meet the desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability, in accordance to standards

d) ability to function on multidisciplinary teams

e) ability to identify, formulate, and solve engineering problems

f) understanding of professional and ethical responsibility

# The 12 Student Outcomes* as prescribed by the PTC criteria. (2)

g) ability to communicate effectively

h) broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context

i) recognition of the need for, and an ability to engage in life-long learning

j) knowledge of contemporary issues

k) ability to use techniques, skills, and modern engineering tools necessary for engineering practice

l) knowledge and understanding of engineering and management principles as a member and leader in a team, to manage projects and in multidisciplinary environments.

*The SO's prescribed by PTC are minimum requirements. HEIs may adopt their own provided it is link to the 12 SO set by PTC.

# What's next?

- Course level
- Once the SO are determined, need to create the curriculum / courses.
- What courses should the programme have?
- What learning outcomes should each course have?

# Course Outcomes (CO)

- These are the learning outcomes at the course level.
- 3 – 5 per course
- Must be a coherent set that captures the essential outcomes of the course. No redundancy.
- Must be measureable!!
  - Level must be specified
  - The outcome can be assessed
- **The course outcomes must contribute to attainment of the programme outcomes.**

# Course Document (syllabus)

- Very important document for OBE

- Contains:
  - Course topics
  - Course objectives
  - Course outcomes - Intended Learning Outcomes (ILO)
  - Delivery methods
  - Assessment methods

# Intended Learning Outcomes (ILO)

Students can

DO WHAT

(how)

# Good or Poor ILO

- What are some attributes of poor ILO?
- Some words to avoid
  - Understand
  - Know
  - Comprehend
- Can an ILO be too detailed?

# Criteria for good ILO

- Specific and clear
- Measurable / observable
- Achievable
- Relevant
- Time-based
- Level of performance stated (based on Bloom's taxonomy settings)*

SMART

* set by each program

# Bloom Taxonomy (Cognitive)

# Bloom's Taxonomy

| Level | Meaning | Action Verbs / Behaviour |
|---|---|---|
| Knowledge | Recalling or remembering something without necessarily understanding it. | Define, describe, identify, label, list, match, memorize, point, select, state |
| Comprehension | Understanding something that has been communicated, without necessarily relating it to other concepts. | Account for, explain, annotate, group, give example, infer, interpret, paraphrase, predict, review, translate |
| Application | Applying a learned concept to solve problems in a particular situation. | Apply, adopt, collect, construct, diagram, discover, demonstrate, illustrate, make use of, manipulate, show, solve, use |

# Bloom's Taxonomy (cont'd)

| Level | Meaning | Action Verbs / Behaviour |
|---|---|---|
| Analysis | Breaking something down into its parts; identification of parts, analysis of relationships between parts, or recognition of organizational principles | Analyze, compare, contrast, diagram, differentiate, dissect, Distinguish, infer, outline, separate, sort, subdivide |
| Synthesis | Creating something new by putting parts of different ideas together to make a whole | Blend, build, change, combine, compile, compose, conceive, create, design, formulate, generate, hypothesize, plan, predict, produce, reorder, revise |
| Evaluation | Judging the value of material or methods as they might be applied in a particular situation; judging with the use of specific criteria | Appraise, assess, arbitrate, award, choose, conclude, criticize, defend, evaluate, grade, judge, prioritize, recommend, referee, reject, select, support |

# How does the LO help teachers?

- Plan the content of teaching.
- Select appropriate teaching/learning methods.
- Set a blueprint for assessments based on the outcomes.
- Selection of assessment methods based on the outcomes.
- Evaluate whether the outcomes are achieved and provide continuous improvement.

# How it helps students…

- Knowing the LOs helps the students to:
  - Know what is expected of them
  - Know what level of expected mastery
  - Know when they have achieved the outcomes
  - Employ appropriate learning strategies to achieve the outcomes.
  - Feedback mechanism

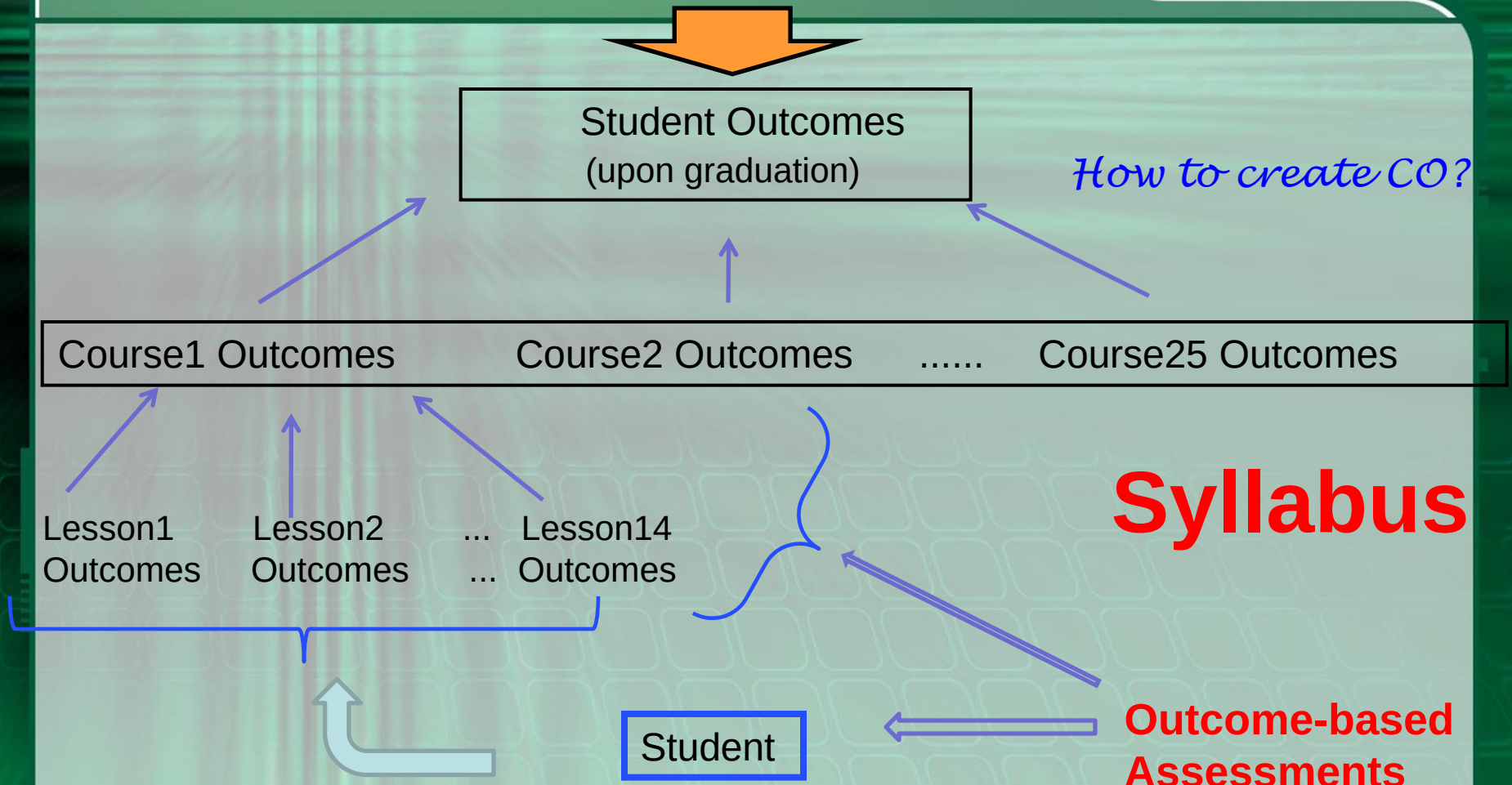
# What's next?  Topic level

- Lesson / Topic outcomes
- What the students can do at the end of the lesson (or end of the week)?
- Specified in the syllabus.

# Putting it together

- How do PO, CO and Lesson outcomes relate to each other?

a) CMO b) External Stakeholders needs c) Professional Bodies
d) Faculty Expertise e) Vision & Missions



# Now, to issue #2

| Key Questions | Stages of T&L |
|---|---|
| What are the outcomes we want students to have? | Planning |
| How to best help them achieve those outcomes? | Delivery |
| How do we know when they have achieved those outcomes? | Assessment |
| How to close the loop? | Evaluation |

# Delivery

- Delivery is crucial
  - Our teaching has big impact on student learning
- Student-centered learning
  - Active-learning methods
  - Rapport with students
- Active learning methods
  - Get the student engaged in their learning
  - Classroom activities that involve students
  - Geared towards achieving the learning outcomes.
- Key to SCL is active-learning
- Linked to learning outcomes

# Active-learning methods (examples)

- Group work
  - Pair-wise
  - Corporative / Collaborative / Jigsaw
  - Video presentation (role playing)
- Industry based Case Study/Design
- Problem Based Learning
  - ProjectBL
- Experiential Learning

# Now, to issue #3

| Key Questions | Stages of T&L |
|---|---|
| What are the outcomes we want students to have? | Planning |
| How to best help them achieve those outcomes? | Delivery |
| How do we know when they have achieved those outcomes? | Assessment |
| How to close the loop? | Evaluation |

# Assessment

- What are we assessing?

Learning outcomes,

not topics !!!

It's the learning outcome we want the students to have, right?

# Assessment

- Use various assessments methods
  - Why?
  - How to decide which methods to use?
- Increase formative assessments
- Feedback is crucial

# What about?

- What about programme outcomes / course outcomes?

- How to assess them?

1. Indirect measurements

   a) Student self evaluation, employer survey, alumni survey

   b) Lecturer evaluation

2. Direct measurements

   a) Using numbers

# Pause and Assess

- What do we know about OBE?

# Now, to the final issue

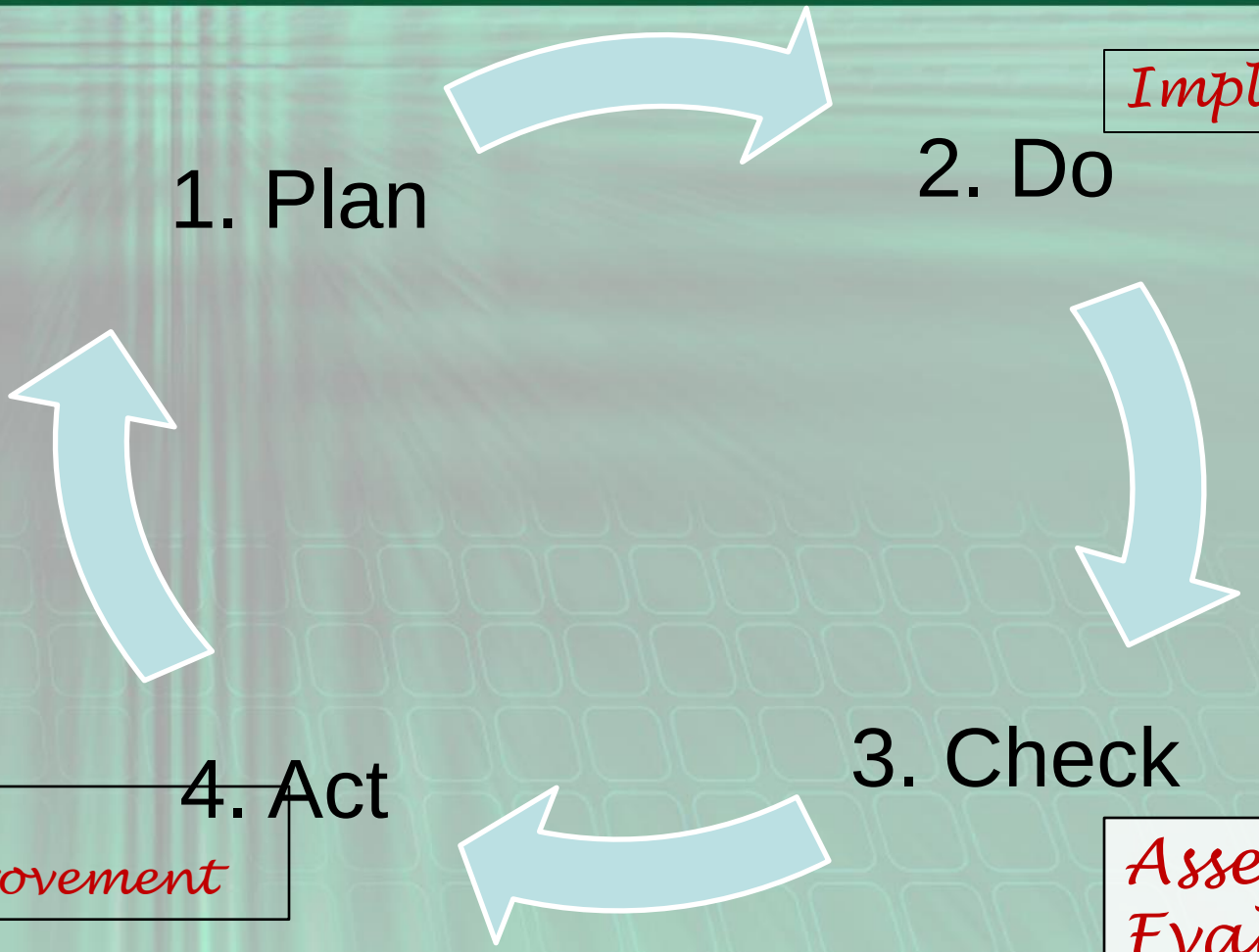
| Key Questions | Stages of T&L |
|---|---|
| What are the outcomes we want students to have? | Planning |
| How to best help them achieve those outcomes? | Delivery |
| How do we know when they have achieved those outcomes? | Assessment |
| How to close the loop? | Evaluation |

# Evaluating

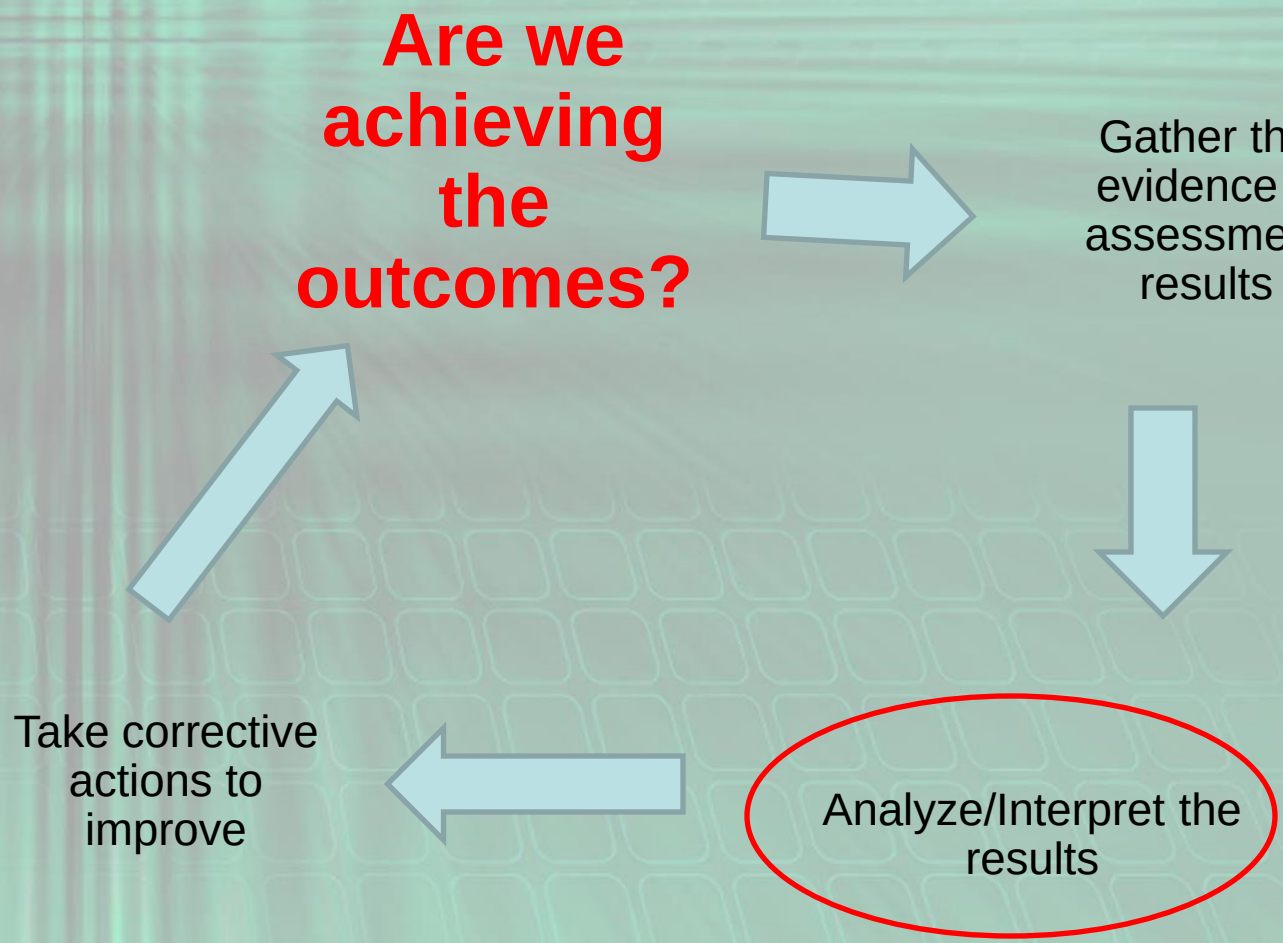
What is it we are evaluating?

A) Whether the learning outcomes were achieved.
B) To what degree were their achieved.
C) How come?

# PDCA cycle


1. Plan
2. Do
Implement it
3. Check
Assess & Evaluate
4. Act
For improvement

# Evaluation & CQI (Check / Act)

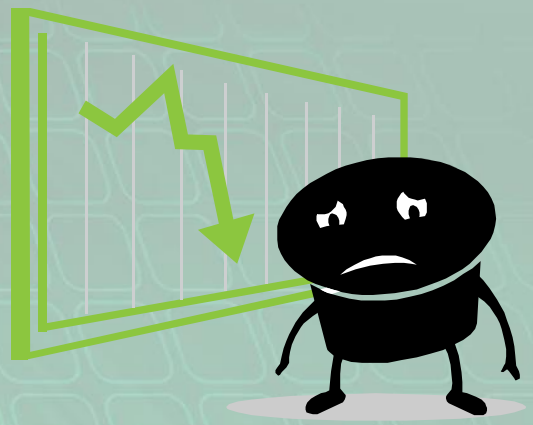


# Evaluation & CQI

1. Analysis of results
   - Looking for patterns/anomalies in results
   - Why CO achieved / not achieved

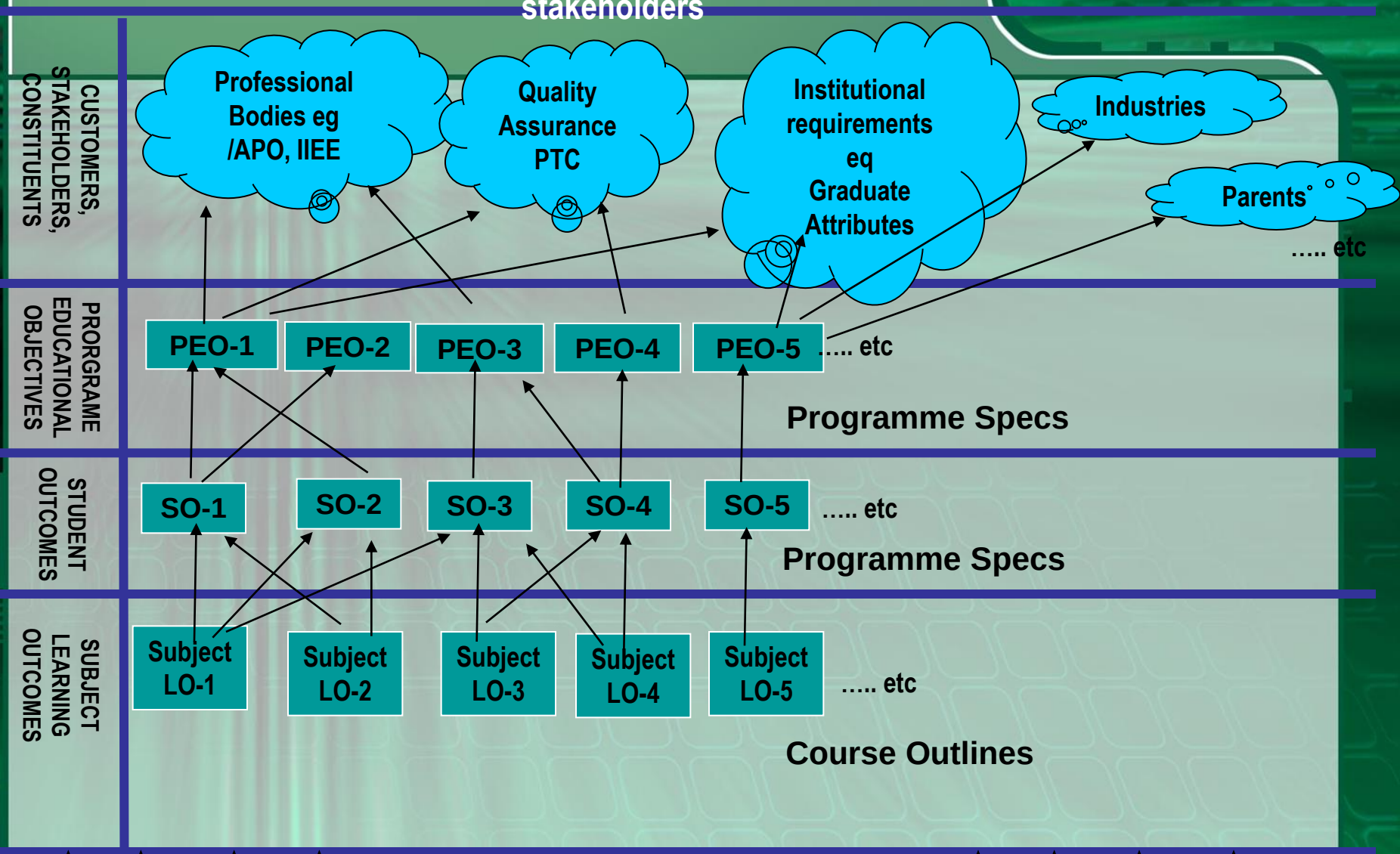
2. Determine causes
   - What caused those patterns / anomalies

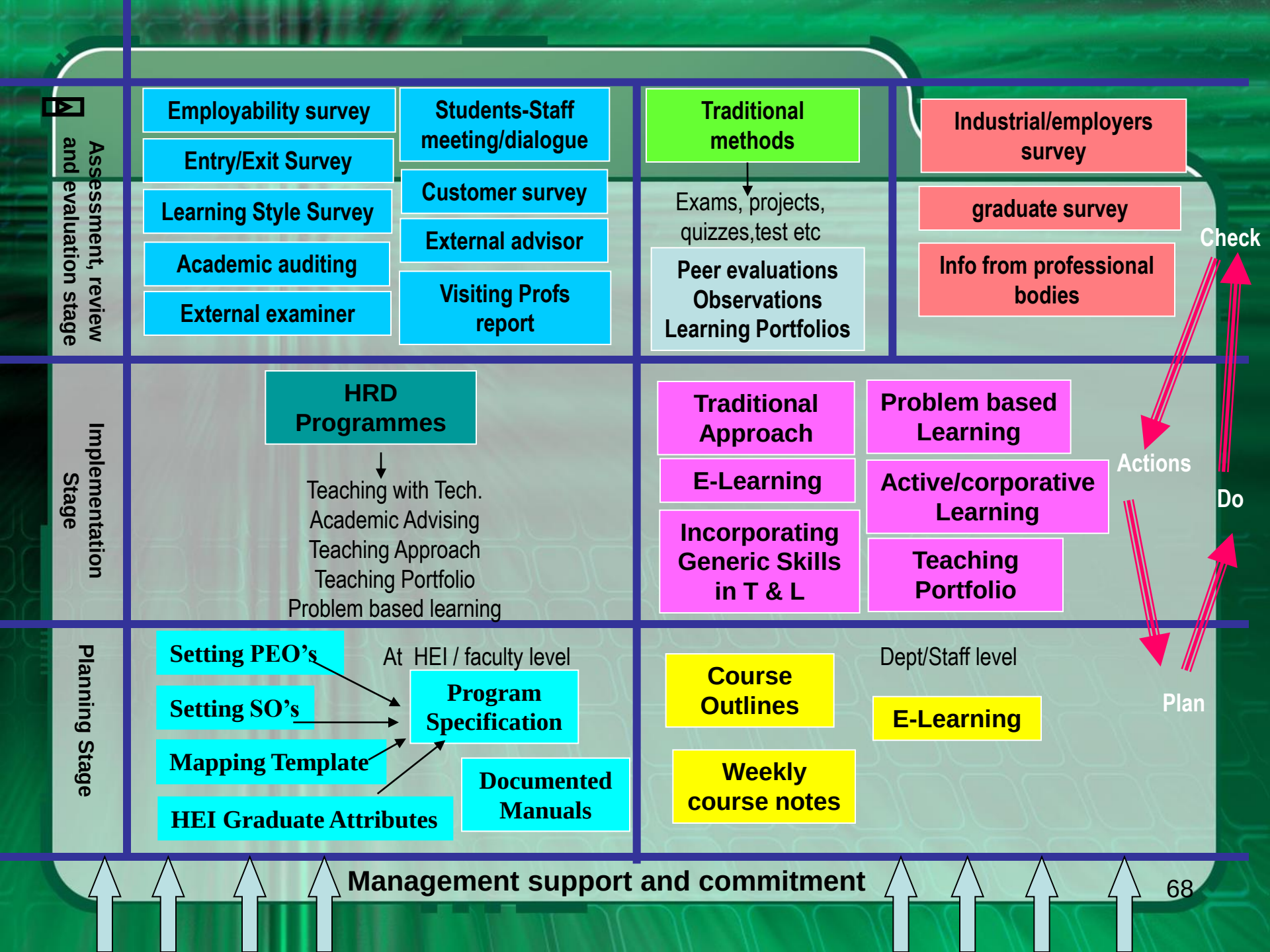
- Assessment
  - assessment methods?
  - assessment content?
- Delivery
  - Delivery methods
- Other causes?



# Putting OBE Together

# Relationships between subject LO's, Course LO's PO's and compliance to the stakeholders




Assessment, review and evaluation stage
Employability survey
Entry/Exit Survey
Learning Style Survey
Academic auditing
External examiner
Students-Staff meeting/dialogue
Customer survey
External advisor
Visiting Profs report
Traditional methods
Exams, projects, quizzes,test etc
Peer evaluations
Observations
Learning Portfolios
Industrial/employers survey
graduate survey
Info from professional bodies
Check
Implementation Stage
HRD Programmes
Teaching with Tech.
Academic Advising
Teaching Approach
Teaching Portfolio
Problem based learning
Traditional Approach
Problem based Learning
E-Learning
Active/corporative Learning
Incorporating Generic Skills in T & L
Teaching Portfolio
Actions
Do
Planning Stage
Setting PEO's
Setting SO's
Mapping Template
HEI Graduate Attributes
At HEI / faculty level
Program Specification
Documented Manuals
Course Outlines
Weekly course notes
Dept/Staff level
E-Learning
Plan
Management support and commitment

# Then what's next?

- Outcomes-Based Accreditation (OBA)

**Philippine Technological Council (PTC)**

Slides courtesy of PTC

# Background: Washington Accord

- Washington Accord: Signed 1989
- Philippines became Provisional Member in 2013
  - substantial equivalency of accreditation systems.
  - graduates prepared to practice engineering at the entry level

# WHO ARE THE CURRENT WA SIGNATORIES

1) Australia - represented by Engineers Australia (1989)
2) Canada – represented by Engineers Canada (1989)
3) United Kingdom – represented by Engineering Council UK (1989)
4) United States – represented by ABET (1989)
5) New Zealand – represented by Institution of Professional Engineers New Zealand (1989)
6) Ireland – represented by Engineers Ireland (1989)
7) Hong Kong – represented by The Hong Kong Institution of Engineers (1995)
8) South Africa – represented by Engineering Council South Africa (1999)
9) Japan – represented by Japan Accreditation Board for Engineering Education (2005)
10) Singapore –represented by Institution of Engineers Singapore (2006)
11) South Korea – represented by the Accreditation Board for Engineering Education Korea (2007)
12) Chinese Taipei – Institution of Engineering Education Taiwan (2007)
13) Malaysia – represented by the Board of Engineers Malaysia (2009)
14) Turkey – represented by MUDEC (2011)
15) Russia – represented by RAEE (2012)
16) India – represented by NAB (2014)
17) Sri Lanka – represented by IES (2014)

•Provisional Members –**Pakistan, Bangladesh, Philippines, China,**

# PHILIPPINE TECHNOLOGICAL COUNCIL

- ***Umbrella organization of the 13 national engineering organizations***
- ***Registered with the SEC** since **1981***
- ***A focal point for collective advocacies of engineering professionals***
- ***Experienced with Mutual Recognition Arrangements*** such as APEC Engineer Register, ASEAN Engineering Register, and now, ASEAN Chartered Professional Engineers.
- ***Maintains active memberships and networking*** with international and regional engineering bodies such as the Intl Engg Alliance , ASEAN Federation of Engg Org'ns (Founding Member), FEIAP, WFEO, and the NABEEA
- ***Recognized by CHED under the MOA and CMO 37 Series of 2012*** as the accreditation body for engineering education in accordance with international standards such as Washington Accord.
- *One of four (4) Councils of all APOs under the PRC.*


PHILIPPINE TECHNOLOGICAL COUNCIL

# ACCREDITATION AND CERTIFICATION BOARD FOR ENGINEERING & TECHNOLOGY

National Engineering Center
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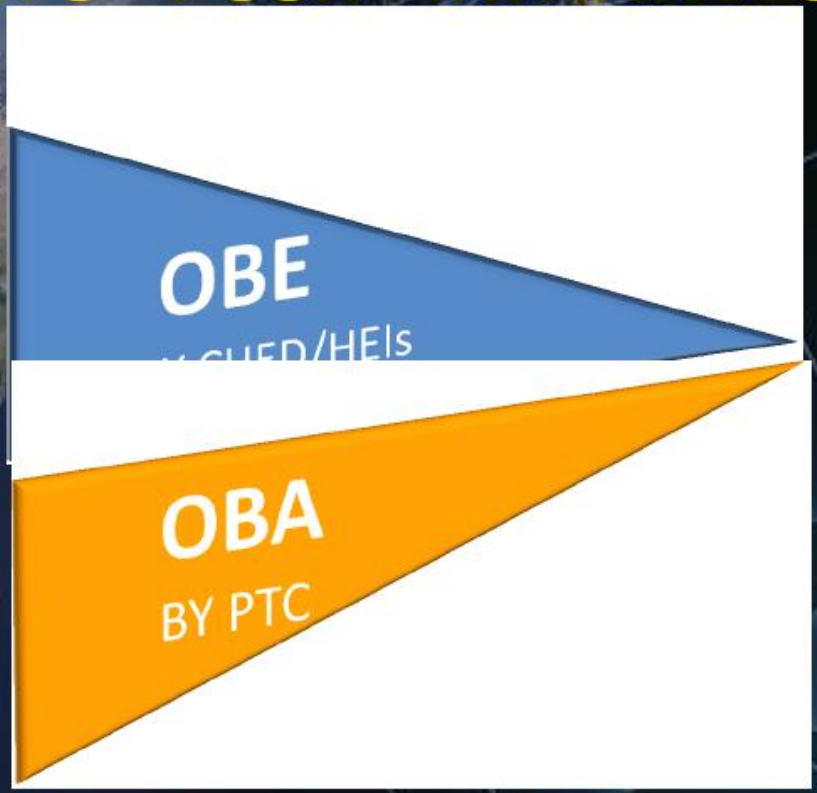
Tel/Fax: (632) 926 6893 • (632) 687 7187

Members:

| SAEP | PSAE | PICHE | PICE | IIEE | IECEP | GEP | PIIE | PSME | SMEP | PSEM | SONAME | PSSE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Aeronautical Engineers | Agricultural Engineers | Chemical Engineers | Civil Engineers | Electrical Engineers | Electronics Engineers | Geodetic Engineers | Industrial Engineers | Mechanical Engineers | Metallurgical Engineers | Mining Engineers | Naval Architect & Marine Engineers | Sanitary Engineers |

# THE TWO "PUSH" INITIATIVES



# MAJOR ADVOCACIES OF PTC

- **PROMOTE CONTINUOUS QUALITY IMPROVEMENT OF ENGINEERING PROGRAMS AND ENGINEERING GRADUATES**
- **FOSTER THE MOBILITY OF ENGINEERING PROFESSIONALS ACROSS NATIONAL BOUNDARIES** (NOT ONLY FOR A SELECT FEW BUT FOR MAJORITY OF OUR ENGINEERING GRADUATES)
- **FOSTER THE INTERNATIONAL RECOGNITION OF ENGINEERING PROGRAMS AND THE QUALIFICATIONS OF ENGINEERS**
  - **RECOGNITION OF ENGINEERING PROGRAMS**
  - **STAGE 1** - RECOGNITION OF GRADUATE QUALIFICATIONS AT **ENTRY LEVEL**
  - **STAGE 2** - RECOGNITION OF PROFESSIONAL QUALIFICATIONS AT **INDEPENDENT PROFESSIONAL PRACTICE LEVEL**, e.g., APEC ENGR, ASEAN ENGR, ASEAN CHARTERED PROFESSIONAL ENGR, INTERNATIONAL PROFESSIONAL ENGINEER

# WHERE ARE WE NOW?

- WASHINGTON ACCORD – PROVISIONAL MEMBER (JUNE 2013)
  - APPLYING FOR FULL SIGNATORY (JUNE 2015)
- ENGINEERING REGISTERS
  - APEC ENGINEER
  - ASEAN ENGINEER
  - ASEAN CHARTERED PROFESSIONAL ENGINEER
- SOON:
  - SYDNEY ACCORD
  - INTERNATIONAL PROFESSIONAL ENGINEERS

# ROLES OF ENGINEERING PROFESSIONAL ORGANIZATIONS (APOs/EPOs)

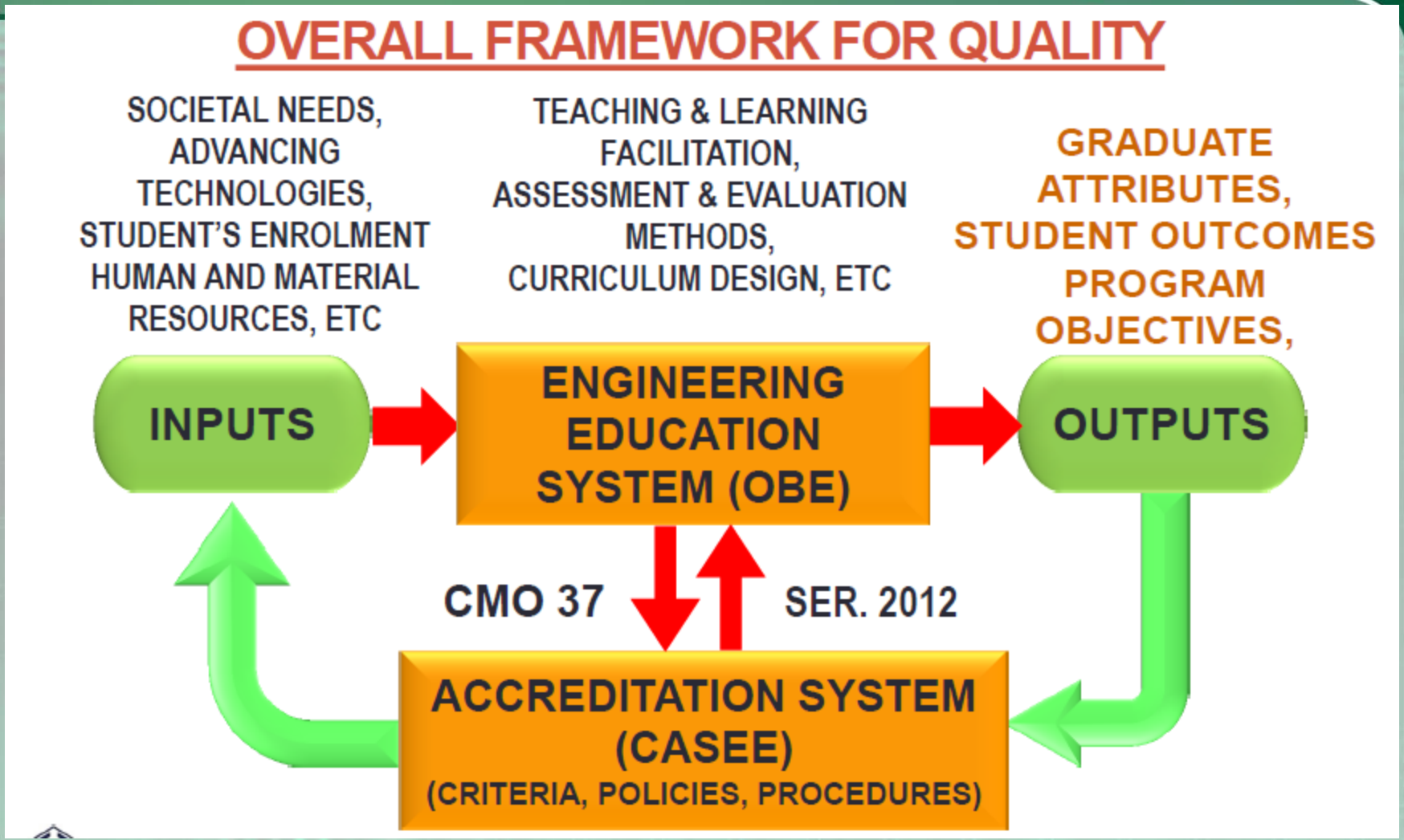
IN SUPPORT OF THESE ADVOCACIES, APO/EPOs:

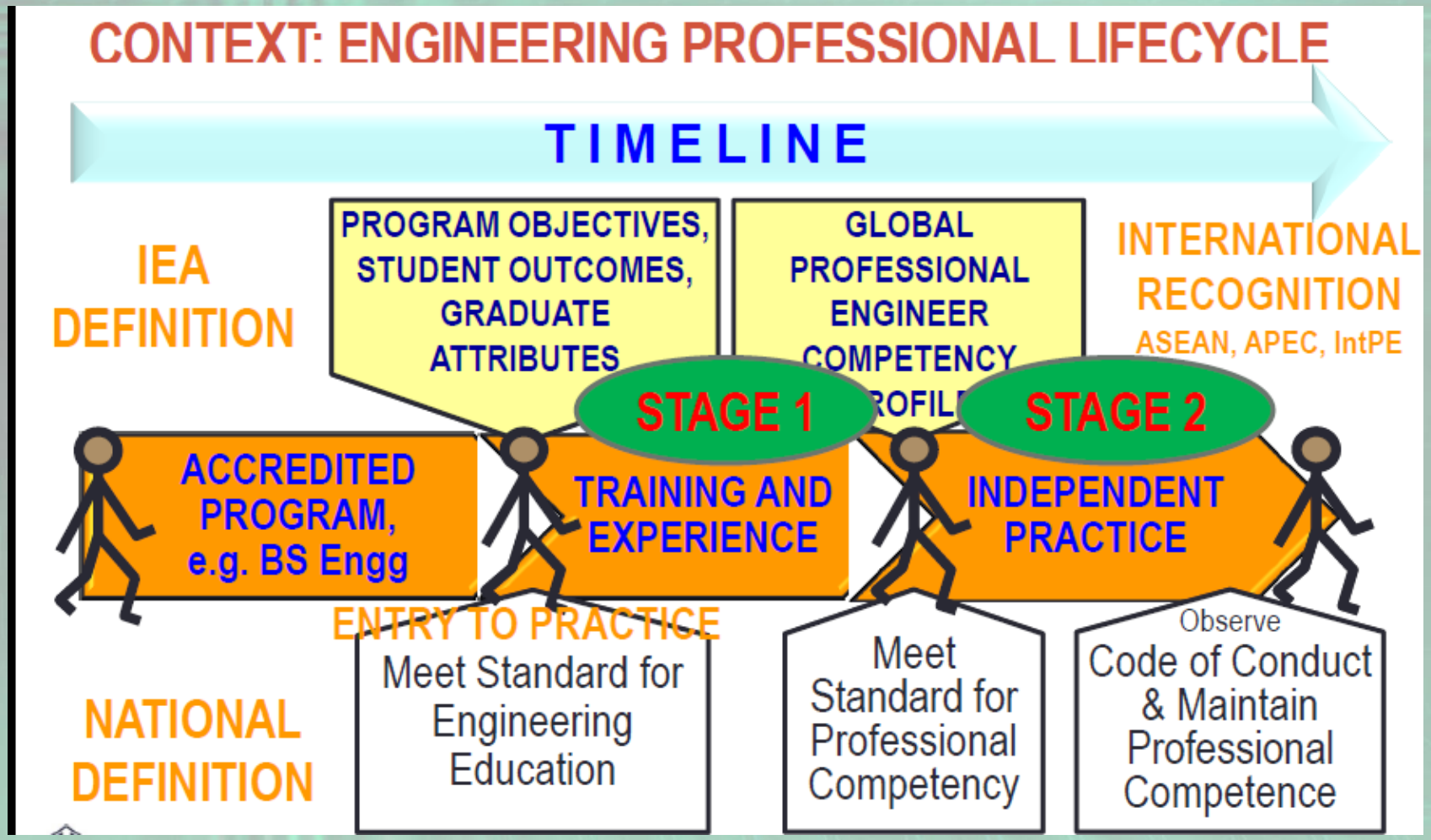
- ACT AS "GUARDIANS" OF QUALITY OF EDUCATION AND ENGINEERING PRACTICE
- SIT IN THE PTC BOARD OF TRUSTEES
- SIT IN THE PTC ACCREDITATION BOARD
- SIT IN THE ENGINEERING ACCREDITATION COMMISSION
- NOMINATE PROGRAM EVALUATORS AND HELP PTC MAINTAIN REGISTRY OF PEvs
- ENCOURAGE ENGINEERS TO REGISTER UNDER THE APEC, ASEAN & ACPE REGISTRIES

# ROLES OF HEI

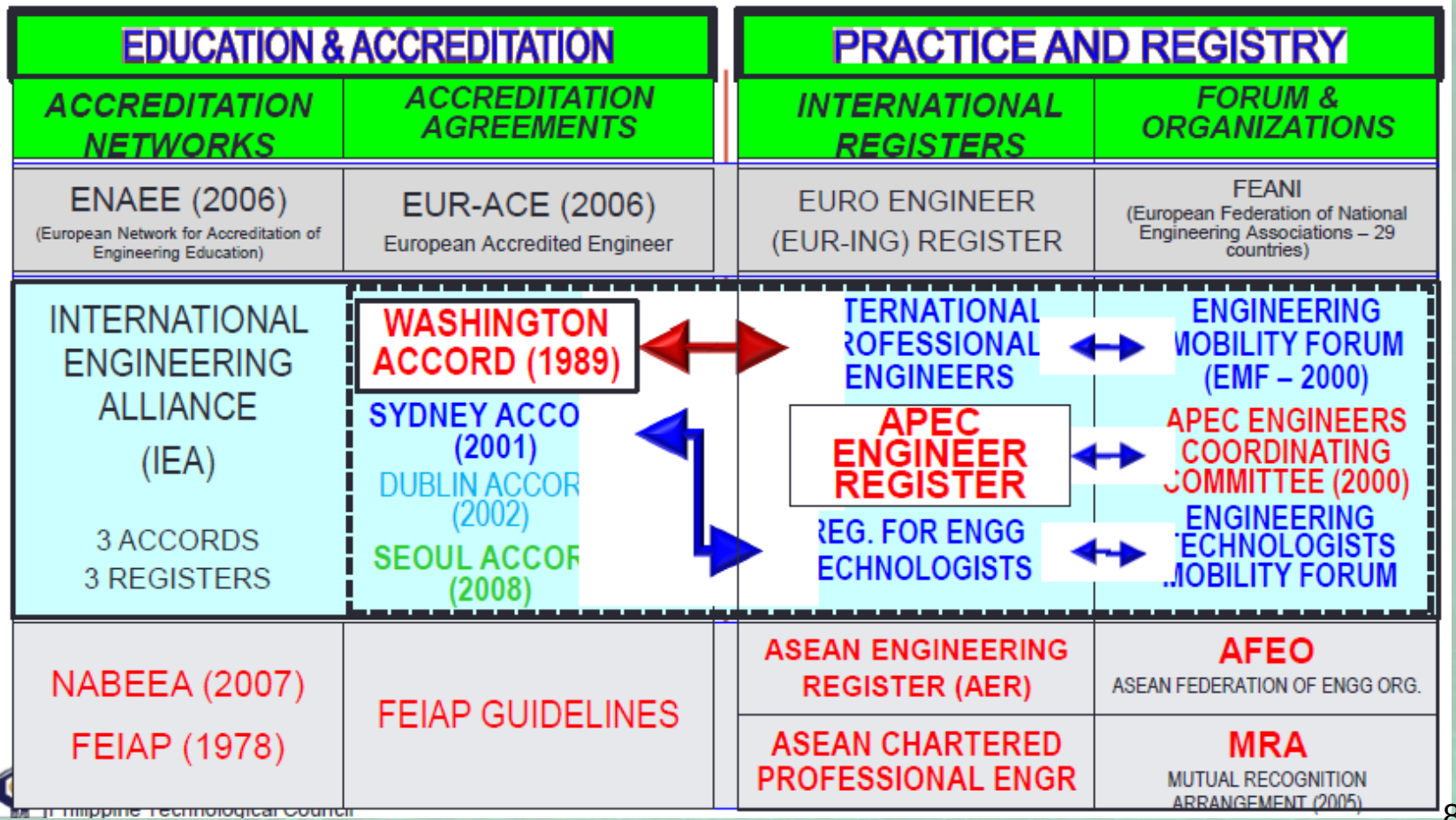
- Implement OBE in accordance with CMO 37 Series 2012
- Submit (voluntarily) the engineering program for accreditation under CASEE
- Maintain accreditation status for continuing recognition.

# PTC Framework for QA




CONTEXT: ENGINEERING PROFESSIONAL LIFECYCLE
TIMELINE
IEA DEFINITION
PROGRAM OBJECTIVES, STUDENT OUTCOMES, GRADUATE ATTRIBUTES
GLOBAL PROFESSIONAL ENGINEER COMPETENCY
INTERNATIONAL RECOGNITION
ASEAN, APEC, IntPE
STAGE 1
STAGE 2
ACCREDITED PROGRAM, e.g. BS Engg
TRAINING AND EXPERIENCE
INDEPENDENT PRACTICE
ENTRY TO PRACTICE
Meet Standard for Engineering Education
Meet Standard for Professional Competency
Observe Code of Conduct & Maintain Professional Competence
NATIONAL DEFINITION

# INTERNATIONAL ARRANGEMENTS IN ENGINEERING EDUCATION, ACCREDITATION AND PRACTICE



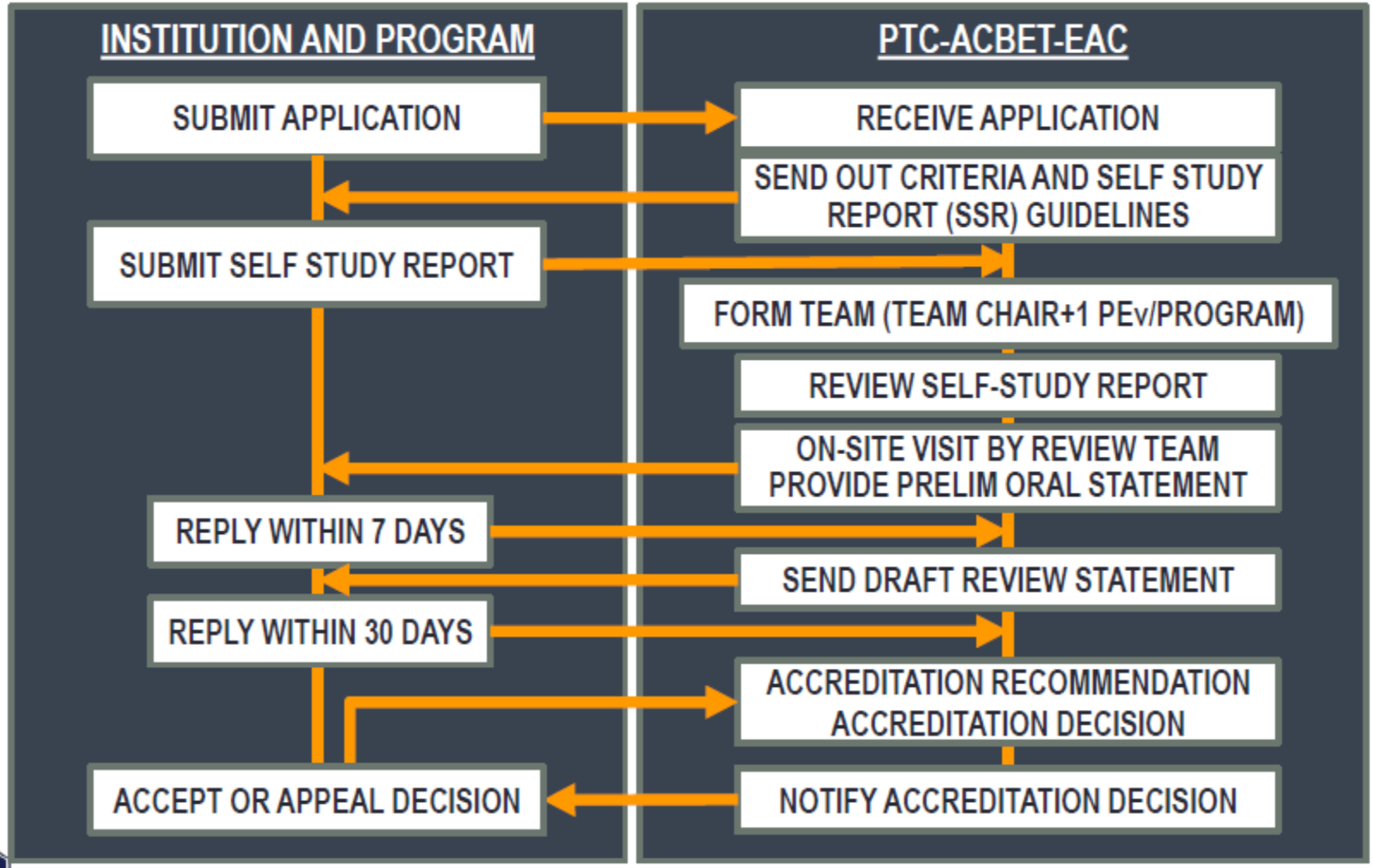
# PTC PROGRAMS FOR ENHANCING ENGINEERS' MOBILITY

| ENGINEER'S LIFECYCLE STAGE /TIME FRAME | DESCRIPTION/ LEVEL OF PRACTICE | PROGRAM FOR RECOGNITION OF QUALIFICATIONS |
|---|---|---|
| **STAGE 2**<br>7 YEARS, 2 YEARS OF WHICH SUBSTANTIAL CHARGE | INDEPENDENT PRACTICE LEVEL | • APEC ENGINEER REGISTER (2003 IEA)<br>• ASEAN ENGINEER REGISTER (2001 AFEO)<br>• ASEAN CHARTERED PROFESSIONAL ENGINEER (2012 MRA G-TO-G) |
| **STAGE 1**<br>0-7 YEARS FROM GRADUATION | **ENTRY TO PRACTICE LEVEL** | • WASHINGTON ACCORD (NEW GRADUATES) – ENGG PROGRAMS (2013)<br>• FEIAP (NEW GRADS)-PROGRAMS (2008)<br>• ASSOCIATE ASEAN ENGINEER (2001 AFEO) |

# STAGE 1 - RECOGNITION OF QUALIFICATIONS AT ENTRY LEVEL

- RECOGNITION OF ENGINEERING PROGRAMS : ACCREDITATION
- RECOGNITION OF QUALIFICATIONS RIGHT AFTER GRADUATION : MEASURE OF ACADEMIC PREPARATIONS
  - KNOWLEDGE
  - SKILLS
  - ATTRIBUTES

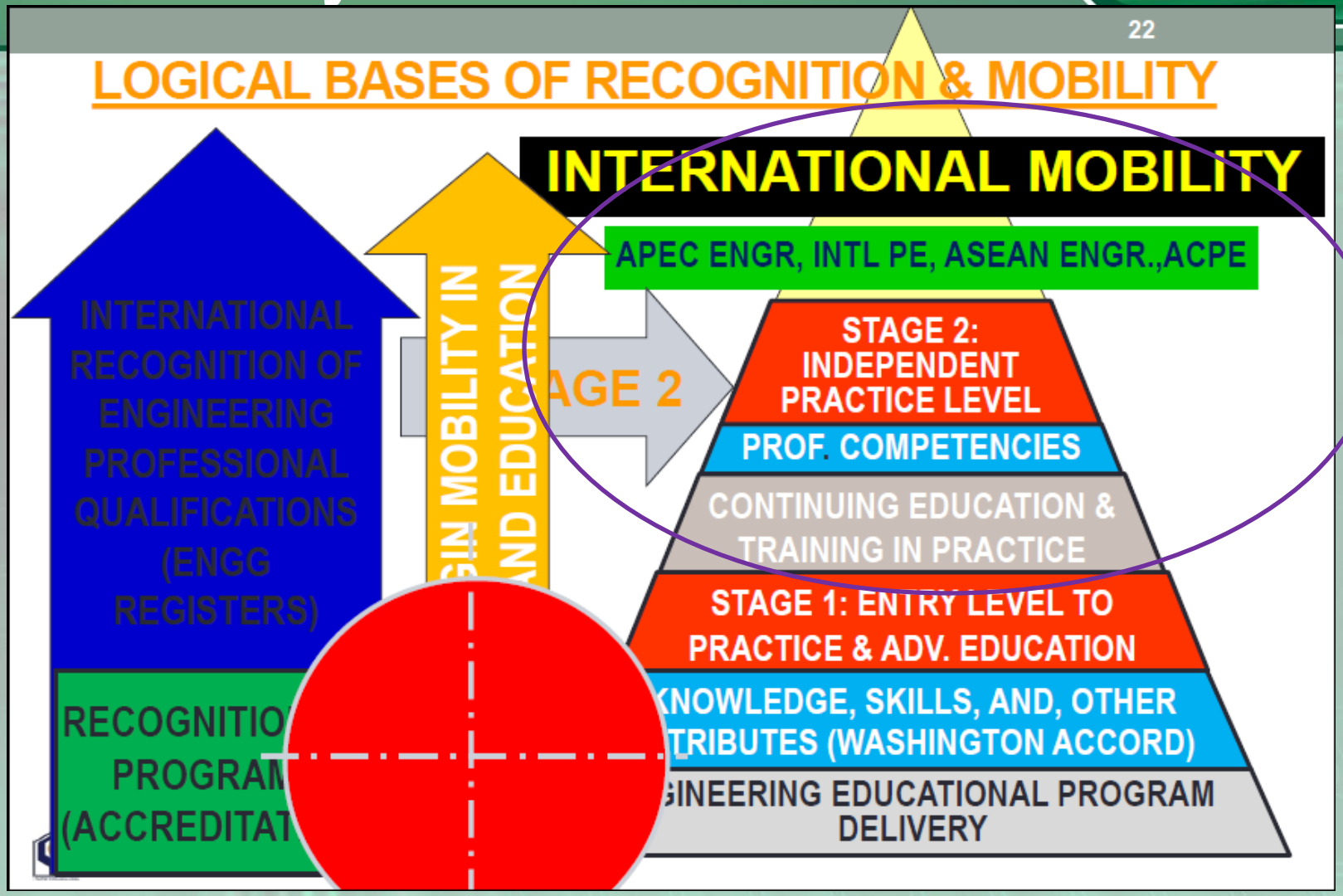
# OVERVIEW OF THE ACCREDITATION PROCESS



# ACCREDITATION CRITERIA

- **9 GENERAL CRITERIA:**
  1. PROGRAM EDUCATIONAL OBJECTIVES
  2. STUDENT OUTCOMES
  3. STUDENTS
  4. FACULTY AND SUPPORT STAFF
  5. CURRICULUM
  6. FACILITIES AND LEARNING ENVIRONMENT
  7. LEADERSHIP AND INSTITUTIONAL SUPPORT
  8. EXTENSION SERVICE, COMMUNITY-ORIENTED PROGRAMS AND INDUSTRY-ACADEME LINKAGE
  9. CONTINUOUS QUALITY IMPROVEMENT
- **SPECIFIC PROGRAM CRITERIA:**
  - CURRICULUM
  - FACULTY

# And Finally…


22
LOGICAL BASES OF RECOGNITION & MOBILITY
INTERNATIONAL MOBILITY
APEC ENGR, INTL PE, ASEAN ENGR.,ACPE
INTERNATIONAL RECOGNITION OF ENGINEERING PROFESSIONAL QUALIFICATIONS (ENGG REGISTERS)
AGE 2
STAGE 2: INDEPENDENT PRACTICE LEVEL
PROF. COMPETENCIES
CONTINUING EDUCATION & TRAINING IN PRACTICE
STAGE 1: ENTRY LEVEL TO PRACTICE & ADV. EDUCATION
KNOWLEDGE, SKILLS, AND, OTHER TRIBUTES (WASHINGTON ACCORD)
GINEERING EDUCATIONAL PROGRAM DELIVERY
RECOGNITIO
PROGRAM
(ACCREDITAT

# The End

*Thank you*
*for your patience …*