

Semakan Kurikulum

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- Terminologies:
 - PEO PO/PLO
CO/CLO, LO
 - Assessment
 - Evaluation
- MQA/MQF Requirement
 - Level (Diploma,
Bachelor, MSc, PhD)
 - Credit
 - Outcomes
(PO1-PO8/
PO1-PO9,
PO1-PO10, PO1-
PO11)
- OBE

Program Educational Objectives (PEO)

- Broad statements that describe the career and professional accomplishment that the program is preparing graduates to achieve.

Program Outcomes (PO) or Program Learning Outcomes (PLO)

- specific outcomes for a particular program of study.

Course Outcomes (CO) or Course Learning Outcomes (CLO)

- specific outcomes for a particular course.

Topic Outcomes

- specific outcomes for a certain topics in a particular course.

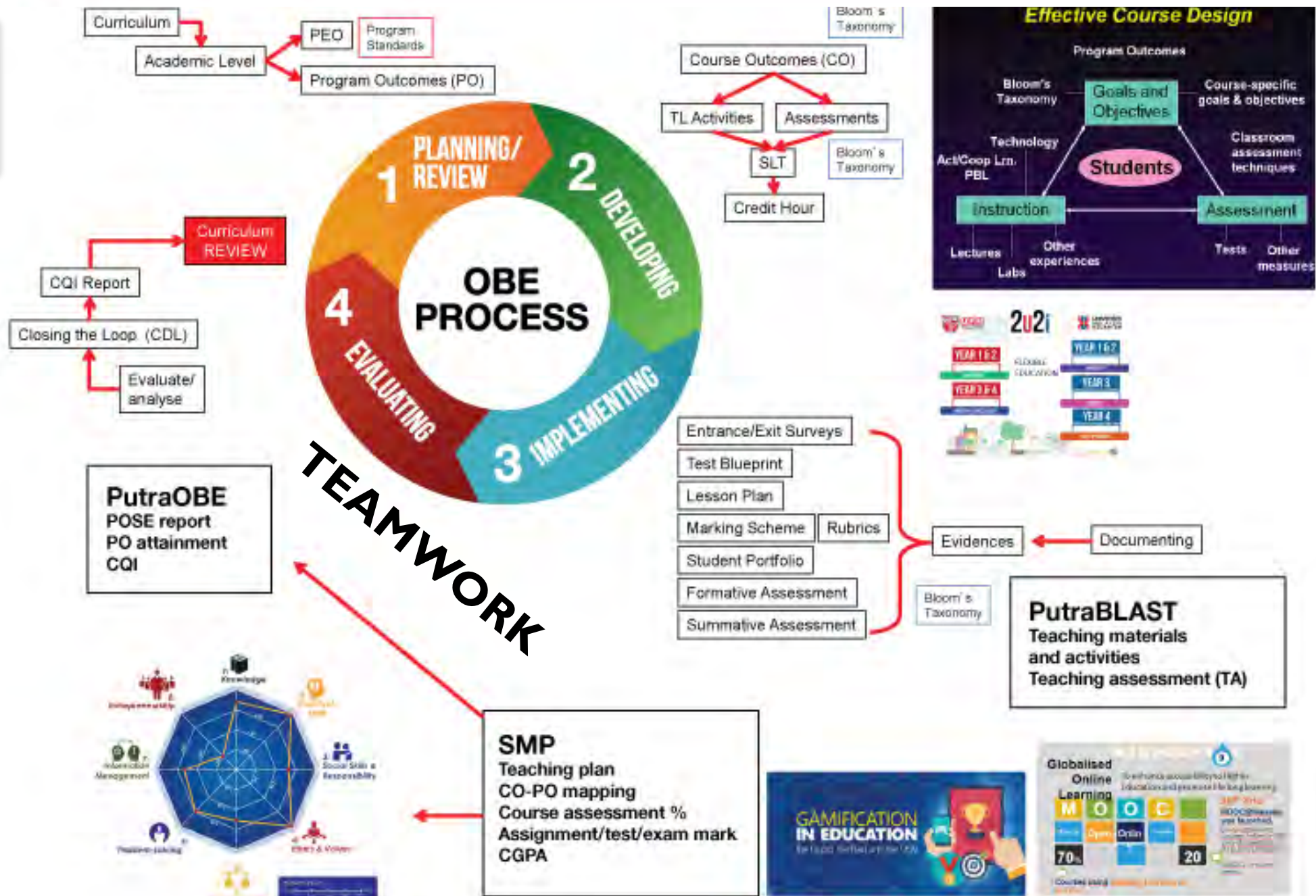
Learning outcomes (LO)

- a generic term that can be used interchangeably at any levels of outcomes.

OBE It is not what we teach. It is what they learn.

OBE is an approach that focuses on the **outcomes** and not just the process. It involves restructuring of curriculum, assessment and reporting practices in education to reflect the achievement of outcomes rather than just accumulation of course credits and grades.

It involves documenting the intended results, how the results will be measured & monitored and taking action to make real learning happen.



Kerangka Kurikulum Tersedia Masa Hadapan

Kementerian Pendidikan Malaysia (KPM) melalui surat bertarikh 6 Disember 2018 telah menyarankan Universiti Awam (UA) supaya membangunkan dan mentransformasikan program akademik masing-masing dengan merujuk kepada Kerangka Kurikulum Tersedia Masa Hadapan.



PrAise:
Putra
Alternative
Assessment



03

UPM Academic
Transformation



PUTRAFLEX:
UPM Flexible
Curriculum



01

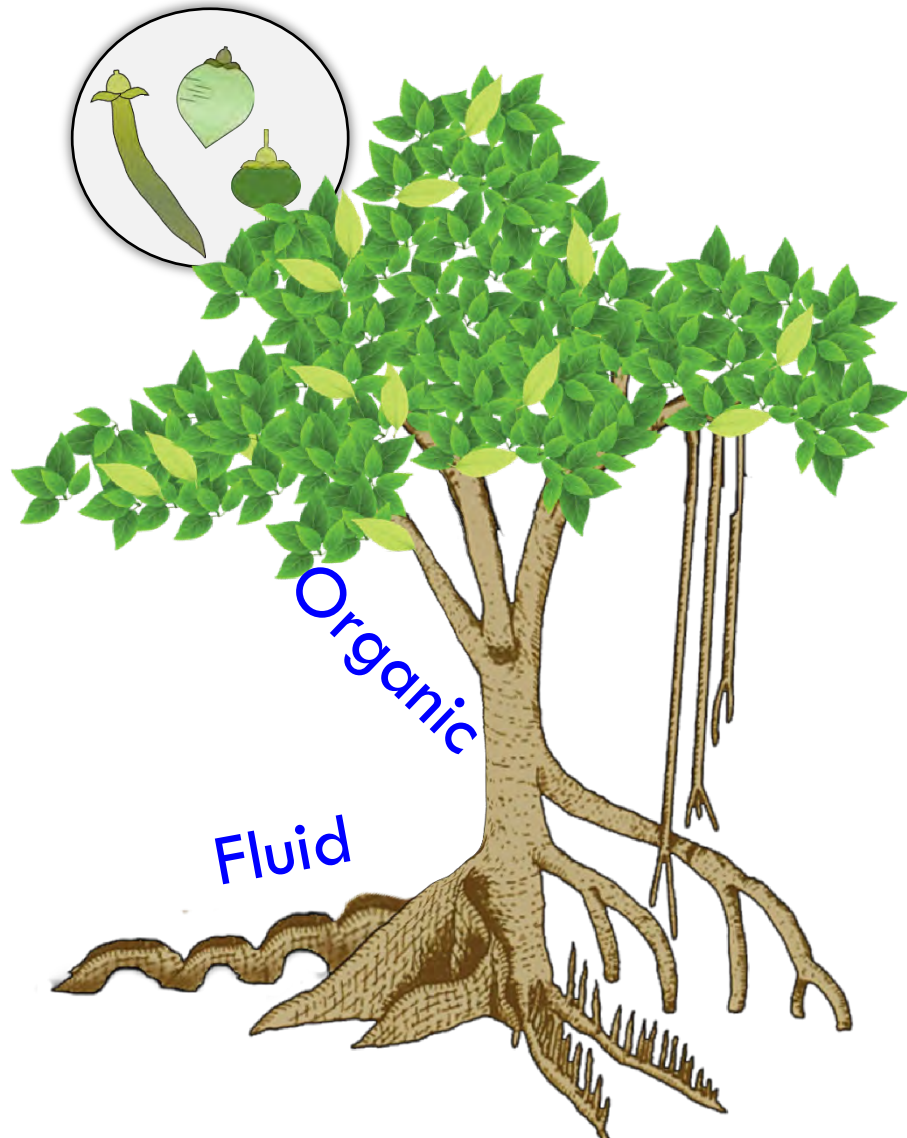
PrIDe:
Putra
InnoCreative
Delivery



02

What's is Flexible Education?

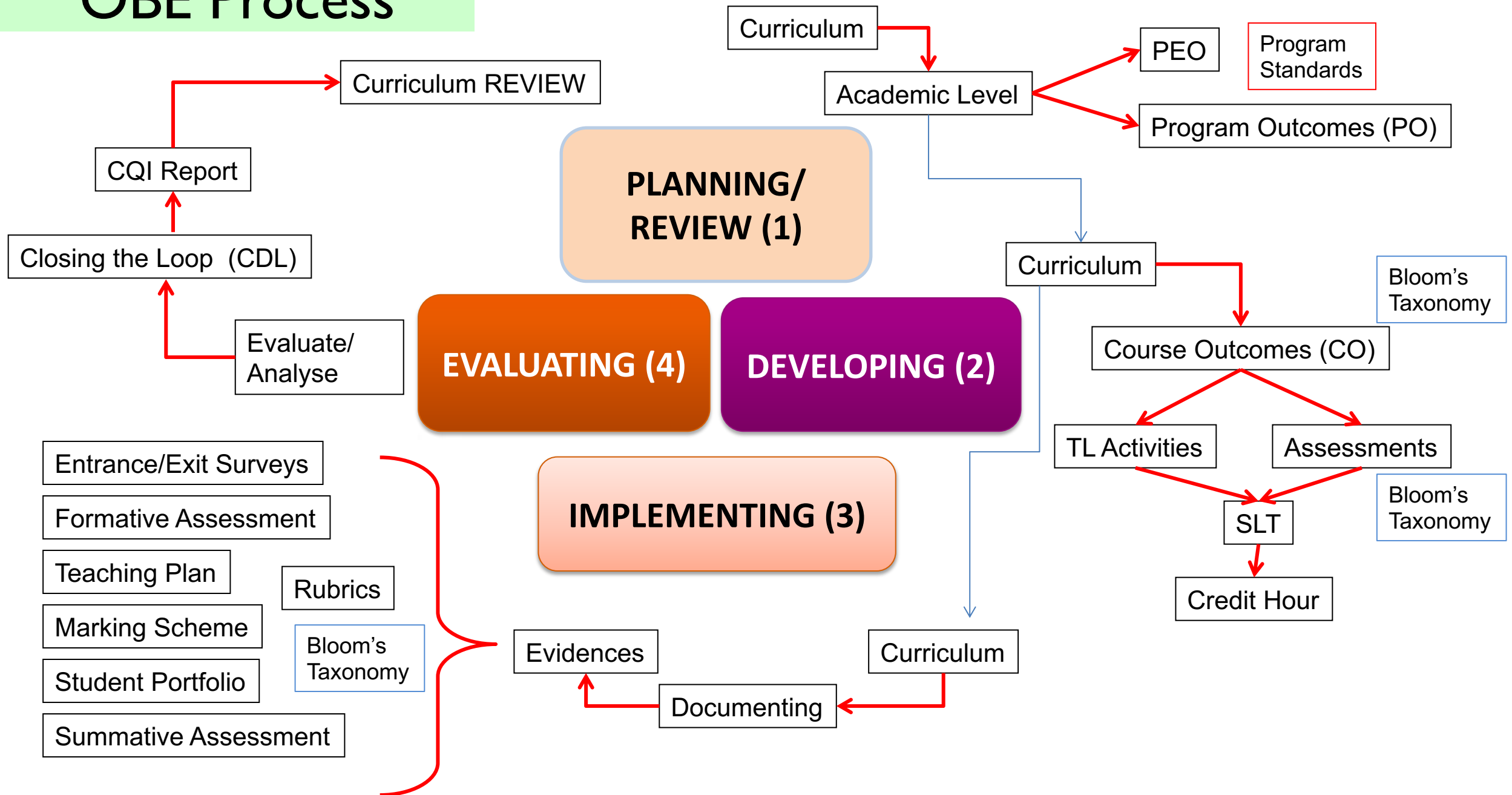
Conceptually, a “**flexible curriculum**” is described as a curriculum that emphasises two key characteristics, which are, “fluid” and “organic”.



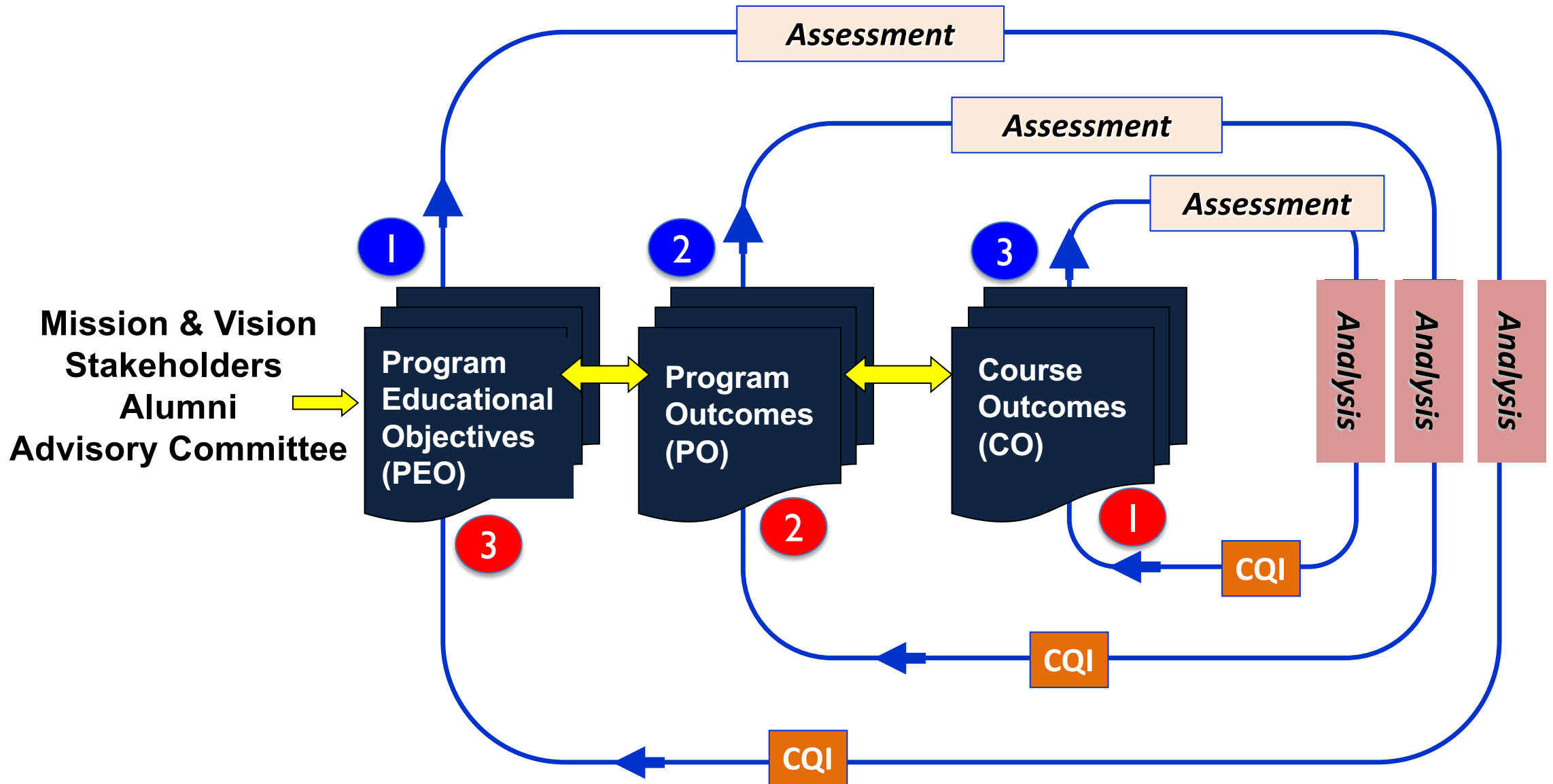
The word "**fluid**" refers to the nature of a substance that is continuously flowing, liquid or unsolidified. A fluid curriculum is therefore not fixed or rigid, and easily adapts and adjusts in response to circumstances.

The word “**organic**” refers to a natural characteristic, one that is not synthetic or artificial. An organic curriculum, therefore, is one which encourages learning to grow in its natural state, whereby students are allowed to grow as learners by exploring knowledge/skills of their own choice.

OBE Process



CQI at three different levels



Different levels of LOs

Vision and Mission of the Institution

Assessment Methods in Different Levels of Learning Outcomes

Long-term Outcomes

Short-term Outcomes

Interrelated and Complement Each Other

Programme Educational Objectives (PEO)

Programme Outcomes (PO)

Course Outcomes (CO)/
Course Learning Outcomes (CLO)

Weekly/Topic Outcomes

Few years after Graduation – 3 to 5 years

Employer Survey, Alumni Survey

Competent engineers who are leaders in ..

Upon graduation - Nine (9) MOHE LO

My3S, Exit Survey, Prog.Survey

.. able to demonstrate critical thinking skills to solve

Upon course completion Use Bloom's Taxonomy of Learning Domains (C/A/P)

Sum/Form/Cont. Assessments

.. able to explain the physical principles of ..

Upon topic completion Use appropriate Taxonomy of Learning Domains (C/A/P)

Sum/Form/Cont. Assessments

.. able to explain Archimedes principle of ..

Differences between **PEO**, **PLO** and **CO**

What is **PEO**?

Broad statements describe the career and professional accomplishment that the program is preparing graduates to achieve

Few years after Graduation – 3 to 5 years

What is **PLO**?

Statements that describe what students are expected to know and be able to do by the time of graduation.

These relate to the **knowledge (C), skills (P) and behaviours (A)** that the student acquire in their programs

What is **CLO**?

Measurable statements what students are expected to know and able to do by the end of each individual courses

Programme Educational Objectives (PEO)

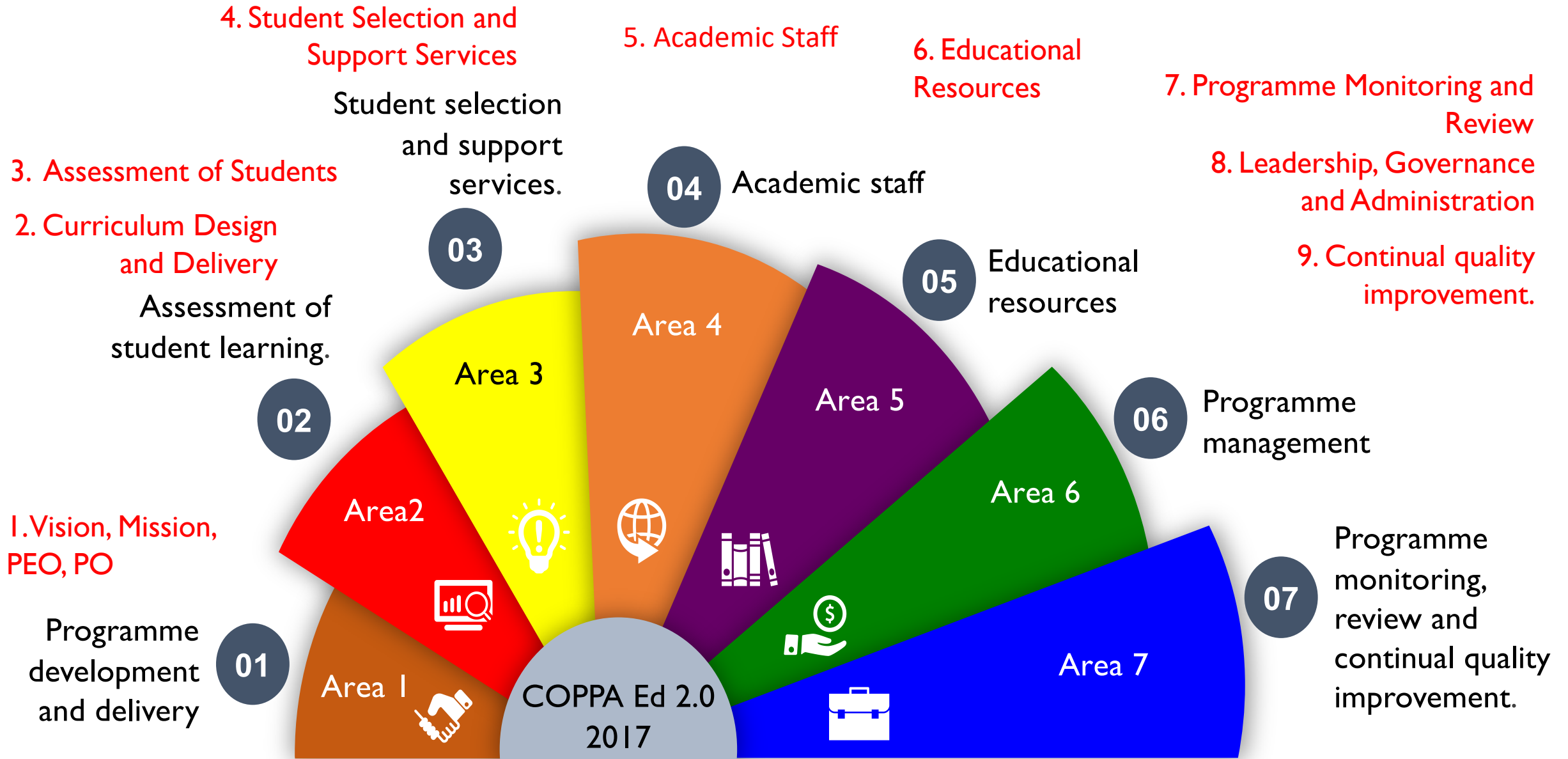
Broad statements describe the career and professional accomplishment that the program is preparing graduates to achieve

- Not a repeating statement of POs
- Each PEO addresses specific graduate competencies
- Performance Indicators or targets (PI)
- Process put in place to **measure** the PEO, e.g., **alumni survey**
- Alumni survey questionnaires must be **designed** to reflect targeted competencies of the PEOs

1. knowledgeable in the field of computer and communication systems engineering with appropriate skills and attitude to work in industry.
2. creative and innovative, as well as, sensitive and responsible towards the society, cultures and environment.
3. capable to work within the global working environment and capable to do research and engage in life-long learning in the field of computer and communication systems engineering.
4. capable to work in advanced design and development in related fields of computer and communication systems engineering.

Few years after
Graduation – 3 to 5 years

1. demonstrate a comprehensive understanding of Biotechnology
2. operate and maintain basic Biotechnology equipment
3. analyse, synthesise and integrate knowledge and information
4. apply theoretical knowledge and practical skills
5. conduct basic guided research
6. demonstrate the ability to seek, adapt, and provide solutions to address challenges and concerns in Biotechnology
7. recognise and practise the concept of life long learning
8. demonstrate an understanding and awareness of basic commercial, ethical, legal and social issues related to Biotechnology
9. communicate and demonstrate interpersonal skills





**MALAYSIAN
QUALIFICATIONS
FRAMEWORK (MQF)
2nd EDITION**



15. The main protocol mandated is the implementation of the MQF through subsection 35(1) “The Agency shall be responsible for the implementation of the national framework to be known as the ‘Malaysian Qualifications Framework’, consisting of qualifications, programmes and higher education providers based on a set of criteria and standards, including learning outcomes achieved and credits based on students’ academic load.” (MQA Act 679, 2007).

16. The **framework** is defined as ‘...an instrument that develops and classifies qualifications based on a set of criteria that is agreed nationally and benchmarked with international practices, and which clarifies the academic levels learning outcomes and credit system based on student academic load’ (MQF, 2007). It is intended as a comprehensive, overarching and integrated national qualifications framework. The Framework provides a set of levels and descriptors covering all sectors, which uses the set of levels and outcomes with the intention to bring progression and pathways together, and accommodate all forms of learning. They are related to study and/or work context to make it applicable for academic and TVET type qualifications and purposes.

The Change – A Modest Remodeling

- ✓ Main structure remains as a comprehensive national framework;
 - ✓ 8 levels & Credits system remains & updated.
 - ✓ **Directed to 2 sectors (academic and TVET).**
- ✓ Learning outcomes **remained, explained but clustered, clarify and enhanced** for better talent-lifelong competencies - education and employment.
- ✓ Improve understanding to learners, programme designers and users of qualifications of expected capabilities of learners.

Changes: Learning Outcomes

General notes:

- Generic & contextualised application: academic, professional, technical & vocational and work.
 - Reflects continuum of learning.
 - Progressive complexity.
 - Action verbs.
- } Relate to NEP, 1996
- LOs are generally interconnected and integrated **in application** (relate to NEP,1996).

Changes: Learning Outcomes to Competency

MQF 2.0 clustered, re-profiled and retained the eight domains of Generic Learning Outcomes. Aligned to National Education Philosophy (1991); MEB (2013-2025); MEB (2015-2025) (HE)

| | | |
|---|---|---|
| <p>1. Knowledge –insights into facts, ideas, theories, skills aspects – technicalities/ specialization (information/media literacy?)</p> | <p>2. Cognitive skills application (R Blooms/Solo) Remember Understanding Applying Analysing Evaluating Creating</p> | <p>3. Functional skills application – cross critical skills includes</p> <ul style="list-style-type: none"> • work skills (practical, technical, specialized) • Interpersonal & communications, • Digital, numeracy • Leadership & team skills |
| <p>5. Ethic and professionalism</p> | <p><u>Application (applied and integrative approach) in context and responsibility</u></p> | <p>4. Personal skill-autonomous lifelong learner, self development, reflective, proactive and values</p> |

(Zita, 2018)

Malaysian Qualifications Framework 2nd Edition: Level Descriptors

| MQF LEVEL | Summary of Learners' Profile | CLUSTER 1: Knowledge and Understanding | CLUSTER 2: Cognitive skills | CLUSTER 3: FUNCTIONAL WORK SKILLS | | | | CLUSTER 4: Personal and entrepreneurial skills | CLUSTER 5: Ethics and Professionalism |
|---|--|---|---|---|--|--|---|---|--|
| | | | | Practical skills | Interpersonal and Communication Skills | Digital and Numeracy Skills | Leadership, Autonomy and Responsibility | | |
| Level 6 BACHELOR GRADUATE CERTIFICATE/ DIPLOMA | Learners will demonstrate a thorough comprehension of broad based and coherent body of knowledge and skills for para and full professional work embedding research, innovation and creativity in | Describe advanced and comprehensive, theoretical and technical knowledge and demonstrate relevant skills in a specialized field, or of a multidisciplinary nature related to the field of study, work and/or practice | Demonstrate intellectual independence in the application of knowledge within specific field(s) by applying critical, analytical and evaluation skills in the field of study/work/practice. | Apply a range of essential methods and procedures to solving a broad range of complex problems. Review, make adjustments and supervise related practices and processes | Convey ideas both in written or oral forms using appropriate and different forms of presentation, confidently, accurately and coherently in appropriate context in a well-structured manner to a diversity of audiences. | Use a broad range of information, media and technology applications to support study and/or work. Use and combine numerical and graphical/visual data for study/work. | Work autonomously, and show leadership and professionalism in managing responsibilities within broad organizational parameters. Undertake significant levels of work related | Engage effectively in self-directed lifelong learning and professional pathways. Demonstrate entrepreneurial competency with selected project(s). Demonstrate an appreciation of | Demonstrate adherence, and ability to identify ethical issues, make decision ethically, and act professionally within the varied social and professional environment and practice. |
| | specialized areas. Demonstrate professionalism, resilience commitment to an ethical work culture, sustainability issues and an awareness of global citizenship in alignment with national aspirations. | | Manage, resolve complex applications and handle unpredictable issues with creative and innovative solution(s). Apply skill/knowledge to a range of approaches in the field of study/work/practice. | concerning field of specialization. | Work together with different people in diverse learning and working communities as well as other groups locally and internationally. | | responsibilities of others as well as self. Demonstrate decision making capacities and professionalism by working towards pre-determined goals and outcomes Demonstrate accountabilities, especially in professional fields. | broader socio-political economic and cultural issues at local/national and regional level. | Demonstrate a deep familiarity and knowledge of local and global issues relating to science, technology, business, social and environmental issues. |

LEARNING OUTCOMES BY VARIOUS REGULATORS (Zita, 2018)

| | 5 CLUSTERS (=AQRF) | MQF 2.0 (2017) | MQF 1.0(2007) | MOHE |
|---|-------------------------------------|--|--|--|
| LO By Malaysian Regulators are to support NEP (1988;1996) & MEB (2015-2025) (HE) | Knowledge | 1. Knowledge & understanding | Knowledge | Knowledge |
| | Cognitive competency | 2. Cognitive skills | Problem solving & scientific skill | Critical Thinking and scientific skills |
| | Functional Work Skills | 3. Practical skills | Practical skills | Practical skills |
| | | 4. Interpersonal skills | Communication, leadership, team skills | Communication |
| | | 5. Communications | Social skills & responsibilities | Social skills, team work and responsibility |
| | | 6. Digital skills | Value, attitudes and professionalisms | Value, ethics and professionalism |
| | | 7. Numeracy skills | Managerial and entrepreneurship skills | Managerial & Entrepreneurship skill |
| | | 8. Leadership, autonomy and responsibility | Information management & LLL skills | Information management & LLL skills |
| | | 9. Personal skills 10. Entrepreneurial Skills | | Leadership skills |
| | Ethics & Professionalism | 11. Ethics & professionalism | | |

PO Sedia Ada

PO Sedia Ada

PO UPM

PO UPM

Pengetahuan

Pelajar mempamerkan pengetahuan dan kefahaman tentang fakta, konsep, prinsip dan teori penting berkaitan dengan sistem maklumat.

Kemahiran teknikal/praktikal/psikomotor

Pelajar boleh membangunkan penyelesaian berkomputer dan menggunakan alat yang sesuai untuk menganalisis prestasinya.

Kemahiran berfikir dan pendekatan saintifik

Pelajar dapat menganalisis masalah, membangunkan model dan merekabentuk penyelesaian, mengimplementasi dan menguji perisian bagi memenuhi keperluan dunia sebenar.

Kemahiran berkomunikasi

Pelajar mempamerkan kemahiran berkomunikasi serta berupaya membentangkan projek dengan baik.

Kemahiran sosial & bertanggungjawab

Pelajar mempamerkan kemahiran bekerja dalam pasukan, kemahiran antara perorangan dan kemahiran sosial.

PO1

PO2

PO3-CTPS

PO4-CS

PO5-TS

PO Baharu

PO Baharu

MQF Edisi Kedua

MQF Edisi Kedua

Pengetahuan dan Kefahaman

Pelajar dapat mengaplikasi pengetahuan dan kefahaman tentang maklumat, fakta, prinsip, konsep dan teori secara sistematik dalam bidang berkaitan.

Kemahiran Praktikal

Pelajar boleh melaksanakan kemahiran kerja dengan alatan/kaedah/prosedur yang sesuai secara kompeten dalam bidang berkaitan.

Kemahiran Kognitif

Pelajar dapat menganalisis masalah, membangunkan strategi penyelesaian dan menggunakannya bagi menyelesaikan masalah dalam bidang berkaitan.

Kemahiran Komunikasi

Pelajar boleh menyampaikan maklumat serta idea secara berkesan, melalui lisan atau bertulis dengan menggunakan bahasa yang sesuai.

Kemahiran Interpersonal

Pelajar boleh berinteraksi, berkolaborasi dan bekerja secara berpasukan dalam bidang berkaitan.

PO Sedia Ada

PO Sedia Ada

PO UPM

PO UPM

Profesionalisme, nilai, sikap dan etika

Pendidikan sepanjang hayat dan pengurusan informasi

Kemahiran pengurusan dan keusahawanan

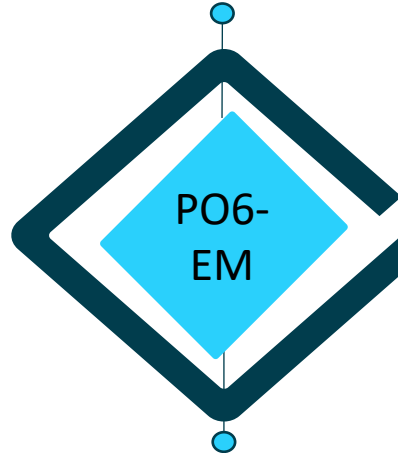
Kemahiran kepimpinan

Pelajar boleh menggunakan amalan profesional dalam pembangunan selesaian perisian.

Pelajar boleh menggunakan kemahiran dan prinsip pembelajaran sepanjang hayat dalam pembangunan akademik dan kerjaya.

Pelajar boleh mendapatkan maklumat dan menganalisis keperluan pengguna.

Pelajar berperanan secara aktif serta boleh mengetuai aktiviti kumpulan.



PO Baharu

PO Baharu

MQF Edisi Kedua

MQF Edisi Kedua

Etika dan Profesionalisme

Pelajar boleh mengamalkan sikap beretika, berintegriti dan profesional dalam bidang berkaitan.

Kemahiran Digital

Pelajar mampu menggunakan kemahiran dan prinsip sepanjang hayat dengan memanfaatkan teknologi dan aplikasi digital secara beretika bagi menyelesaikan masalah dalam bidang berkaitan.

Kemahiran Personal dan Keusahawanan

Pelajar dapat menggunakan pengetahuan dan kemahiran personal dalam aktiviti keusahawanan.

Kemahiran Kepimpinan, Autonomi dan Tanggungjawab

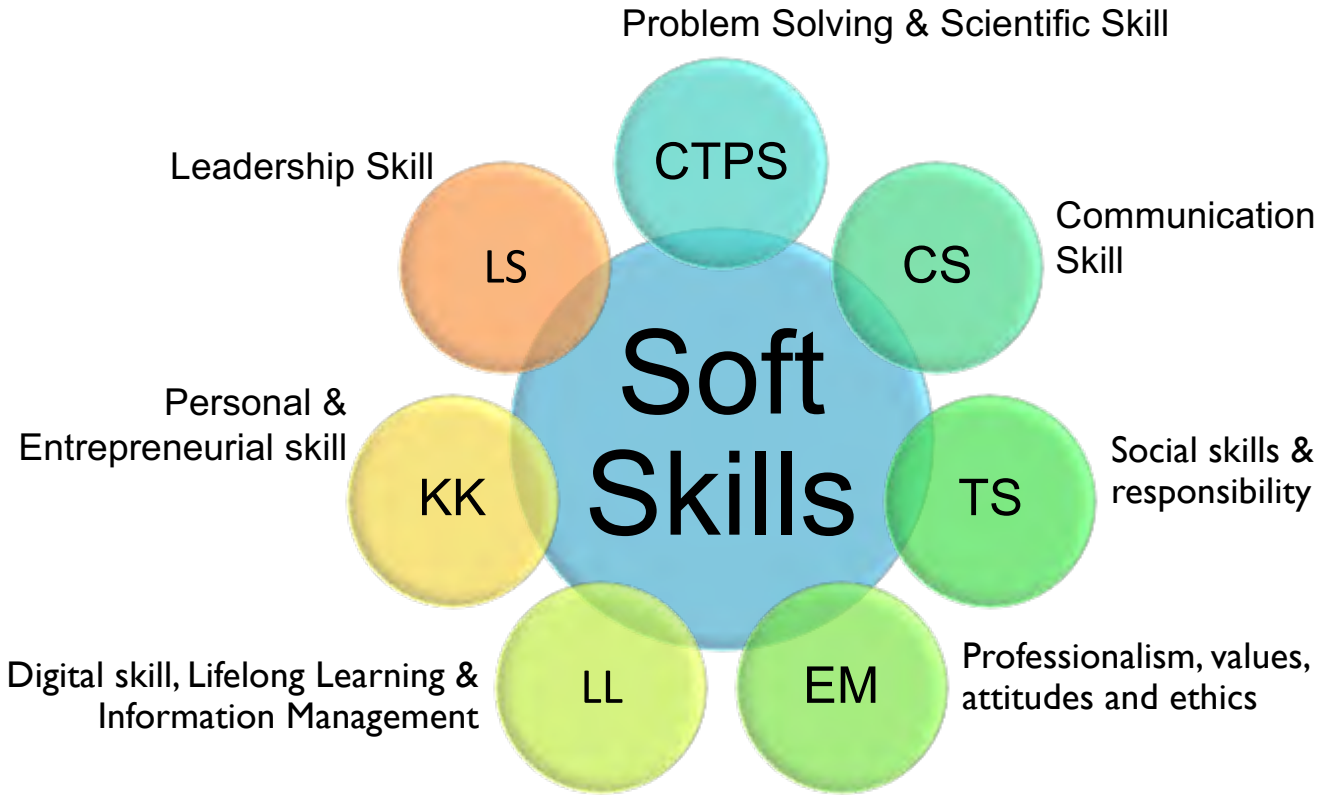
Pelajar boleh memimpin dan memikul tanggungjawab secara profesional dalam bidang berkaitan.

Kemahiran Numerasi

Pelajar mempamerkan kemahiran kuantitatif dan numerasi yang relevan dalam pembelajaran, pekerjaan dan aktiviti berkaitan dengan bidang yang diceburi.

| Kluster Hasil Pembelajaran MQF 2.0 | | | PO UPM Sedia ada | |
|------------------------------------|--|-------------------------|------------------|--|
| K1-PO1 | Pengetahuan dan kefahaman | Cognitive | PO1 | Pengetahuan |
| K2-PO3 | Kemahiran kognitif (CTPS) | Cognitive | PO3 | Kemahiran berfikir dan pendekatan saintifik (CTPS) |
| K3- Kemahiran kerja fungsional | | | | |
| K3(i)-PO2 | Kemahiran praktikal | Psychomotor | PO2 | Kemahiran teknikal/praktikal/ psikomotor |
| K3(ii)-PO5 | Kemahiran interpersonal (TS) | Affective | PO5 | Kemahiran sosial dan bertanggungjawab (TS) |
| K3(iii)-PO4 | Kemahiran komunikasi (CS) | Affective | PO4 | Kemahiran berkomunikasi (CS) |
| K3(iv)-PO7 | Kemahiran digital & Pendidikan sepanjang hayat (LL) | Affective | PO7 | Pendidikan sepanjang hayat dan pengurusan informasi (LL) |
| K3(v)-PO10 | Kemahiran numerasi (NS) | Cognitive/ Affective | | |
| K3(vi)-PO9 | Kepimpinan, autonomi dan tanggungjawab (LS) | Affective | PO9 | Kemahiran kepimpinan (LS) |
| K4-PO8 | Kemahiran personal dan keusahawanan (KK) | Affective | PO8 | Kemahiran pengurusan dan keusahawanan (KK) |
| K5-PO6 | Etika dan profesionalisme (EM) | Affective | PO6 | Profesionalisme, nilai, sikap dan etika (EM) |

| Kluster Hasil Pembelajaran MQF 2.0 | | |
|------------------------------------|---|-------------|
| K1-PO1 | Pengetahuan dan kefahaman | Cognitive |
| K2-PO3 | Kemahiran kognitif (CTPS) | Cognitive |
| K3- Kemahiran kerja fungsional | | |
| K3(i)-PO2 | Kemahiran praktikal | Psychomotor |
| K3(ii)-PO5 | Kemahiran interpersonal (TS) | Affective |
| K3(iii)-PO4 | Kemahiran komunikasi (CS) | Affective |
| K3(iv)-PO7 | Kemahiran digital & Pendidikan sepanjang hayat (LL) | Affective |
| K3(v)-PO10 | Kemahiran numerasi (NS) | Cognitive |
| K3(vi)-PO9 | Kepimpinan, autonomi dan tanggungjawab (LS) | Affective |
| K4-PO8 | Kemahiran personal dan keusahawanan (KK) | Affective |
| K5-PO6 | Etika dan profesionalisme (EM) | Affective |



REFLECTION

Q & A and Feedback

KEPERLUAN SEMAKAN KURIKULUM



KONSOLIDASI

minimum dua (2) atau lebih program akademik asal daripada tahap kelayakan yang sama yang digabungkan - **Bilangan program akademik yang dihasilkan selepas konsolidasi tidak boleh melebihi bilangan program asal yang terlibat.**

SEGREGASI

satu (1) atau lebih program akademik asal daripada tahap kelayakan yang sama yang dipecahkan kepada beberapa program - **Bilangan program akademik yang dihasilkan selepas segregasi tidak boleh sama dengan bilangan program asal yang terlibat.**

CQI melalui dapatan, antaranya :

- Pencapaian PEO, CO & PO;
- Data GE dan GOT

- Pembuat dasar (KPM (PT)/MQA dan lain-lain badan yang berkaitan)
- Badan profesional tempatan
- Badan profesional antarabangsa (jika ada keperluan)
- Industri/majikan
- PTPN dan badan penaja lain
- Pelajar semasa
- Kajian Pengesanan Graduan (*Tracer study*)
- Alumni
- Ibu bapa/masyarakat
- Kedutaan Asing/*Foreign Education Attache* dan lain-lain.

PERKARA YANG PERLU DISEMAK

1

KESESUAIAN NAMA PROGRAM

mengikut **TREND SEMASA** dan **KEFAHAMAN** gambaran/anggapan pemegang taruh terhadap nama program yang ditawarkan.

2

TEMPOH PENGAJIAN PROGRAM

Kaji tempoh berdasarkan data **GOT**;
Tempoh yang tidak membebankan pelajar

3

PENYATAAN PEO, PO DAN LO

3 elemen ini perlu dilihat semula dari aspek penjajaran dan pembentukannya secara "*backward design*" selari dengan visi, misi dan objektif UA masing-masing.

4

STRUKTUR PROGRAM

mengkaji semula kurikulum sedia ada sama ada terdapat keperluan untuk mengubah kepada program berbentuk major-minor atau dwimajor dengan pengkhususan atau melibatkan pertambahan mod industri.

5

BIL KREDIT DAN KREDIT BERGRADUAT

Kredit kursus perlu merujuk garis panduan pengiraan SLT yang ditetapkan oleh MQA. Justifikasi perubahan kepada kredit kursus dan jumlah kredit bergraduat perlu dinyatakan dalam semakan kurikulum.

6

PEMETAAN KURSUS KEPADA PO

Semakan PO perlu dilaksanakan dibagi memastikan peratusan dominan PO sejajar dengan *niche* bidang dan atribut graduan yang akan dihasilkan.

PERKARA YANG PERLU DISEMAK

KAEDAH PENYAMPAIAN

Pakar bidang dan pembangun kursus perlu menetapkan kaedah penyampaian yang bersesuaian dan pelbagai bagi mencapai hasil pembelajaran.

Kaedah terkini berasaskan teknologi yang perlu digalakkan- MOOC, Pembelajaran Teradun dan *Future Classroom*

KAEDAH PENTAKSIRAN

Pendekatan Pentaksiran Berasaskan Hasil perlu digunakan dalam memilih jenis pentaksiran yang bersesuaian dan pelbagai bagi mencapai LO – merujuk pemberat pentaksiran



PENYATAAN LO

Pastikan penjajaran LO dengan PO, pentaksiran dan penyampaian adalah betul agar penilaian pencapaian PO adalah tepat; semak pernyataan LO selaras dengan aras domain taksonomi sama ada kognitif, afektif atau psikomotor.

KANDUNGAN KURSUS

relevan dengan *Body of Knowledge (BOK)*, keperluan negara, industri dan isu semasa;

perlu disemak mengikut keperluan dan tidak perlu menunggu sehingga tempoh semakan kurikulum sepatutnya iaitu 3-5 tahun akan datang;

Penambahan dan pengguguran kursus juga boleh berlaku bagi memastikan kursus yang ditawarkan oleh sesuatu program relevan dan terkini.

MAKLUMAT PERUBAHAN KURSUS

PERKIRAAN PERUBAHAN KREDIT

CONTOH PENGIRAAN

| KURSUS | PERKARA | | SEBELUM SEMAKAN | SELEPAS SEMAKAN | PERUBAHAN KREDIT | NOTA |
|----------------------|---|------|-----------------|-----------------|------------------|---|
| KURSUS TERAS (KT) | TAMBAH | *+ | 0 | 3 | 3 | gugur tambah atau tambah gugur, kira yang mana TINGGI |
| | GUGUR | *+ | 4 | 0 | 4 | |
| | UBAH TARAF KT KEPADA KE | *+ | 3 | 0 | 3 | |
| | UBAH TARAF KE KEPADA KT | *+ | 0 | 3 | 3 | |
| | GANTI KURSUS GUGUR | * | 10 | 6 | 10 | kira yang tinggi |
| | MERGE 2-1 (KIRA PEBEZAAN) | beza | 4 + 4 | 4 | 4 | |
| | MERGE 3-1 (KIRA PERBEZAAN) | beza | 3+3+3 | 9 | 0 | |
| | UNMERGE 1-2 (KIRA PERBEZAAN) | beza | 3 | 2+2 | 1 | |
| KURSUS ELEKTIF (KE) | UBAH TARAF KE KT | | 3 | 0 | 3 | |
| | PERUBAHAN HANYA KIRA PERBEZAAN Jumlah kredit yang ditawarkan | beza | 20 | 15 | 5 | Gugur tambah atau tambah gugur, kira PERBEZAAN |

MAKLUMAT PERUBAHAN KURSUS

PERUBAHAN KREDIT SEMAKAN KURIKUM MERUJUK 2 KATEGORI KURSUS BERIKUT:

AMBIL KIRA (+) DALAM % PERUBAHAN *

- 1 **KURSUS BAHARU** yang diwujudkan di UPM atau **KURSUS SEDIA ADA YANG BAHARU DIMASUKKAN** ke dalam struktur kurikulum program.
- 2 Kursus dengan **PERUBAHAN KANDUNGAN YANG MELEBIHI 30%** dan bertukar kod (catatan: kursus yang melibatkan perubahan kandungan melebihi 30% MESTI menukar kod).
- 3 Kursus **BERTUKAR KREDIT**
- 4 Kursus tanpa perubahan kredit tetapi **MENUKAR CARA PENGENDALIAN** yang melibatkan perubahan hasil pembelajaran kursus contoh: daripada 3 (3+0) kepada 3 (2+1).
- 5 Kursus **BERTUKAR TARAF** dari elektif ke teras atau sebaliknya.
- 6 Kursus **TERAS YANG DIGUGURKAN** tanpa ganti atau digantikan dengan kursus lain
- 7 **KURSUS ELEKTIF YANG DIGUGURKAN DAN DIGANTIKAN** dengan kursus lain **SEKIRANYA JUMLAH KESELURUHAN KREDIT DALAM KUMPULAN KURSUS ELEKTIF BERUBAH**

Contoh:

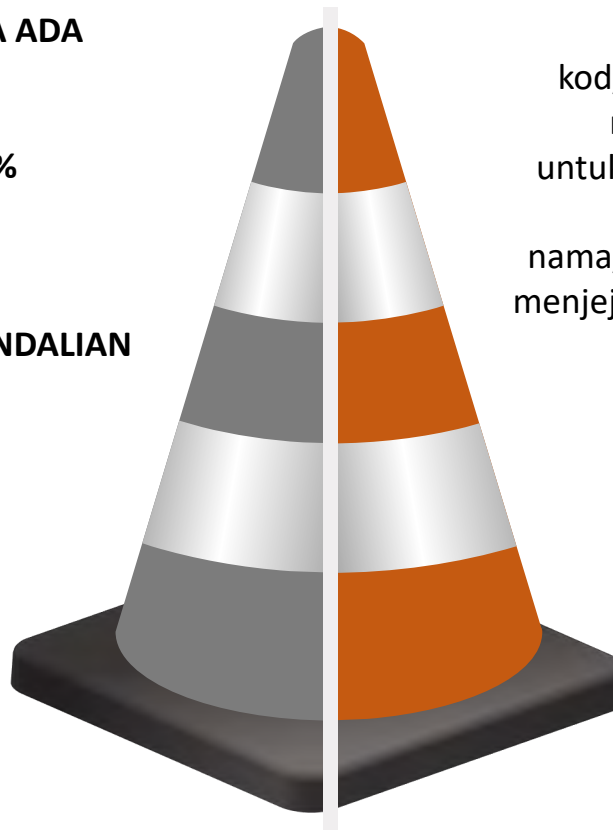
Jumlah kredit semua kursus elektif yang perlu diambil untuk melayakkan pelajar bergraduasi sebelum semakan dan selepas semakan **adalah berbeza, iaitu daripada 33 kredit menjadi 30 kredit** setelah mengugurkan beberapa kursus elektif dan menggantikannya dengan kursus lain. **Maka perubahan yang dikira adalah 3 kredit, iaitu perbezaan kekurangan atau lebihan kredit berkaitan antara kredit sebelum dan selepas semakan.**

TIDAK AMBIL KIRA DALAM % PERUBAHAN

- 1 **KURSUS BERTUKAR NAMA TANPA PERUBAHAN** kod/kandungan/kredit/sinopsis/rangka kursus yang tidak menjejaskan struktur kurikulum dan skema pengajian untuk tujuan penambahbaikan pentadbiran/rekod fakulti.
- 2 **KURSUS BERTUKAR KOD TANPA PERUBAHAN** nama/kandungan/kredit/sinopsis/rangka kursus yang tidak menjejaskan struktur kurikulum dan skema pengajian untuk tujuan penambahbaikan pentadbiran/rekod fakulti.
- 3 **KURSUS BERTUKAR** kandungan/sinopsis (untuk **MENAMBAH BAIK BAHASA/PENULISAN**) tanpa bertukar kod.
- 4 Kursus **BERTUKAR SUSUNAN KANDUNGAN** kuliah atau amali sahaja tanpa bertukar kod.
- 5 **KURSUS ELEKTIF YANG DIGUGURKAN TANPA GANTI/ DIGANTIKAN** DAN JUMLAH KESELURUHAN KREDIT DALAM KUMPULAN KURSUS ELEKTIF TIDAK BERUBAH

Contoh:

Jumlah kredit semua kursus elektif yang perlu diambil untuk melayakkan pelajar bergraduasi **sebelum semakan dan selepas semakan adalah sama, iaitu 33 kredit** setelah mengugurkan beberapa kursus elektif dan menggantikannya dengan kursus lain



| | KELOMPOK MPU2 | SUSUNAN SEMASA KURSUS MPU2 | | SUSUNAN KURSUS DI BAWAH MPU2 BAHARU | |
|--|--|--|---|--|-------------------|
| | | Warganegara | Bukan Warganegara | Warganegara | Bukan Warganegara |
| U1 Penghayatan falsafah, nilai & sejarah | SKP2203 Tamadun Islam dan Tamadun Asia 2 kredit | SKP2101 Kenegaraan Malaysia 3 kredit | SKP3112 Falsafah dan Isu Semasa 2 kredit SKP3122 Penghayatan Etika dan Peradaban 2 kredit | SKP3113 Falsafah dan Isu Semasa Masyarakat Sipil 3 kredit ATAU SKP3123 Penghayatan Etika dan Peradaban di Malaysia 3 kredit DAN LPM2100 Bahasa Melayu Komunikasi 2(2+0) kredit (kekal) | |
| | DAN SKP 2204 Hubungan Etnik 2 kredit | DAN LPM2100 Bahasa Melayu Komunikasi 2(2+0) kredit | | | |
| | 4 kredit | 5 kredit | 4 kredit (kekal) | 5 kredit (kekal) | |
| U2 Penguasaan kemahiran insaniah | MGM3180 Asas Keusahawanan atau kursus setara 3(2+1) kredit | MGM3180 Asas Keusahawanan atau kursus setara 3(2+1) kredit (kekal) | | | |
| | | 3 kredit | 3 kredit (kekal) | | |
| U3 Perluasan ilmu pengetahuan tentang Malaysia | SKP2101 Kenegaraan Malaysia 3(3+0) kredit | FEM2310 Nilai, Budaya dan Masyarakat Malaysia 2(2+0) kredit (kekal) | SKP3123 Penghayatan Etika dan Peradaban di Malaysia 3 kredit | FEM2401 Politik Malaysia dan Masyarakat 2(2+0) kredit | |
| | 3 kredit | 2 kredit | 3 kredit (kekal) | 2 kredit (kekal) | |
| U4 Kemahiran pengurusan masyarakat yang bersifat praktikal seperti khidmat masyarakat dan kokurikulum | Kursus Kokurikulum Berkredit (KKB) yang mempunyai elemen Community-based Learning/Service Learning (CBL/SL) 2 kredit | Kursus Kokurikulum Berkredit (KKB) yang mempunyai elemen Community-based Learning/Service Learning (CBL/SL) 2 kredit (kekal) | | | |
| | Jumlah kredit U4 | 2 kredit | 2 kredit (kekal) | | |
| | JUMLAH KREDIT U1-U4 | 12 kredit | 12 kredit (kekal) | | |

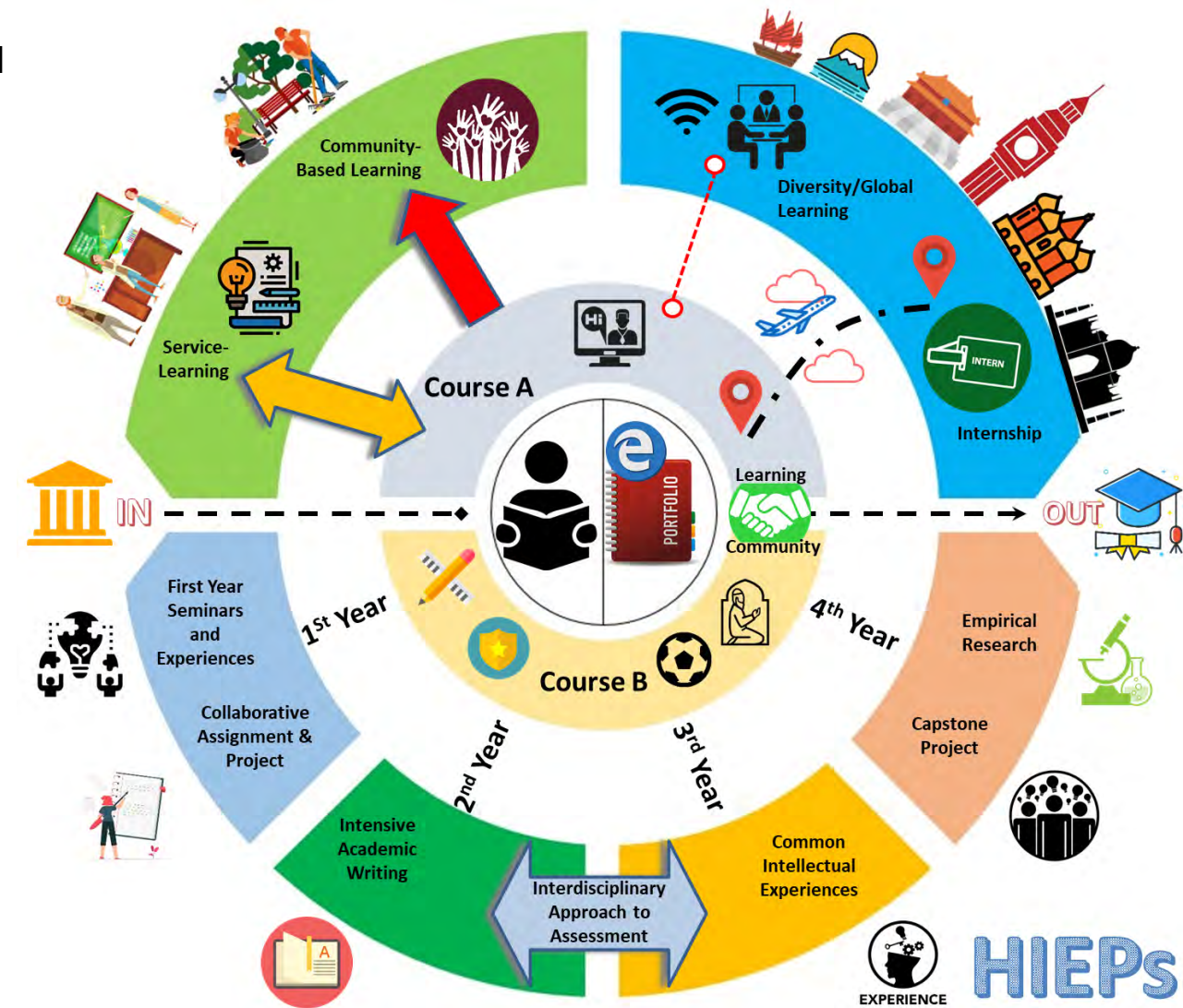
MPU merupakan sebahagian Kursus Universiti. Walau pun jumlah kredit MPU telah dikurangkan, Universiti perlu menawarkan kursus lain seperti dua (2) kursus kemahiran Bahasa Inggeris dan Kursus PRT2008 Pertanian dan Manusia / PRT2009 Pertanian dan Kehidupan sebagai sebahagian daripada komponen Kursus Universiti sebagaimana di dalam Jadual berikut:

| BIL | KOD KURSUS | NAMA KURSUS | KREDIT | CATATAN | |
|----------------------------------|-----------------------------|--|------------------|---|--------|
| KURSUS UNIVERSITI WAJIB | | | | | |
| 1 | LPE2401 (dahulu BBI2422) | Academic Interaction and Presentation | 3(3+0) | Kekal (HIEPs ke-9: Intensive Academic Writing) | |
| 2 | LPE2501 (dahulu BBI2424) | Academic Writing | 3(3+0) | Kekal (HIEPs ke-9: Intensive Academic Writing) | |
| 3 | PRT2008 PRT2009 | Pertanian dan Manusia Pertanian dan Kehidupan | 2(2+0) 2(1+1) | Kekal (Niche UPM) | |
| KURSUS UNIVERSITI PILIHAN | | | | | |
| 4 | FCE3204 | Kemahiran Berfikir | 2(2+0) | Kekal | |
| 5 | KOM3403 | Pengucapan Awam | 3(3+0) | | |
| 6 | SKP2501 | Pengantar Psikologi | 3(3+0) | | |
| 7 | FSA3000 | Falsafah Sains | 2(2+0) | | |
| 8 | SKP2102 | Pengantar Sosiologi dan Antropologi | 3(3+0) | | |
| 9 | CPE3202 | Pengantar Bimbingan dan Kaunseling | 3(3+0) | | |
| 10 | BBK3410 | Penghasilan Bakat Kreatif | 3(2+1) | | |
| 11 | MGM3101 | Prinsip Pengurusan | 3(3+0) | | |
| 12 | ECN3100 | Prinsip Ekonomi | 3(3+0) | | |
| 13 | EMG3001 | Manusia dan Alam Sekitar | 3(3+0) | | |
| 14 | FEM3301 | Etika dan Nilai dalam Pembangunan | 3(3+0) | | |
| 15 | BBM3401 | Bahasa Melayu Tinggi | 3(3+0) | | |
| 16 | LPX2101/2/3 | Bahasa Global Tahap I/II/III | 3(3+0) | | Baharu |

High-Impact Educational Practices (HIEPs)

HIEPs are techniques and designs for teaching and learning that have proven to be beneficial for student engagement and successful learning for students from various backgrounds.

- 01 First-Year Seminars and Experiences (FYS)
- 02 **Service Learning (SL)**
- 03 Community-Based Learning (CBL)
- 04 Learning Communities (LC)
- 05 Intensive Academic Writing (IAW)
- 06 Diversity/Global Learning (DGL)
- 07 Collaborative Assignments and Projects (CAS)
- 08 Empirical Research/Undergraduate Research (ER)
- 09 Interdisciplinary Approach to Assessment (ID)
- 10 Internships (IN)
- 11 Capstone Project (CAP)
- 12 ePortfolio
- 13 Common Intellectual Experiences (CIE)





MINISTRY
OF EDUCATION
MALAYSIA

JPT | DEPARTMENT
OF HIGHER
EDUCATION



SULAM

SERVICE LEARNING MALAYSIA

- UNIVERSITY FOR SOCIETY

SULAM stands for Service Learning Malaysia - University for Society. It is an initiative by Ministry of Education to address the Shift 1 of Malaysia Education Blueprint 2015–2025 (Higher Education).

A course-based, credit-bearing educational experience in which the student participates in a structured service activity that meets identified community needs, reflects on the service activity and experiences to achieve desired learning outcomes, in such a way as to gain deeper understanding of course content, a broader appreciation of the discipline, enhanced sense of personal values and civic responsibility.

SULAM pedagogy supports humanistic and value-driven education as key to strengthening our education system by integrating love, happiness and mutual respect.

Differences between Community-Based Learning (CBL) and Service Learning (SL)-(SULAM)

Community-Based Learning (CBL)

- Community or community institution is a space for learning.

Learning cycle

The assignments may not fulfil community's expectations or needs, but students learn from the experience.

Learning time

Less than 20 hours. Students may carry out less than 20 hours of activities.

Learning outcomes

The primary objective of LO is the application of theory.

Service Learning (SL)

- Learning through community service
- Students apply theoretical knowledge learnt in the classroom to serve the community.

Learning cycle

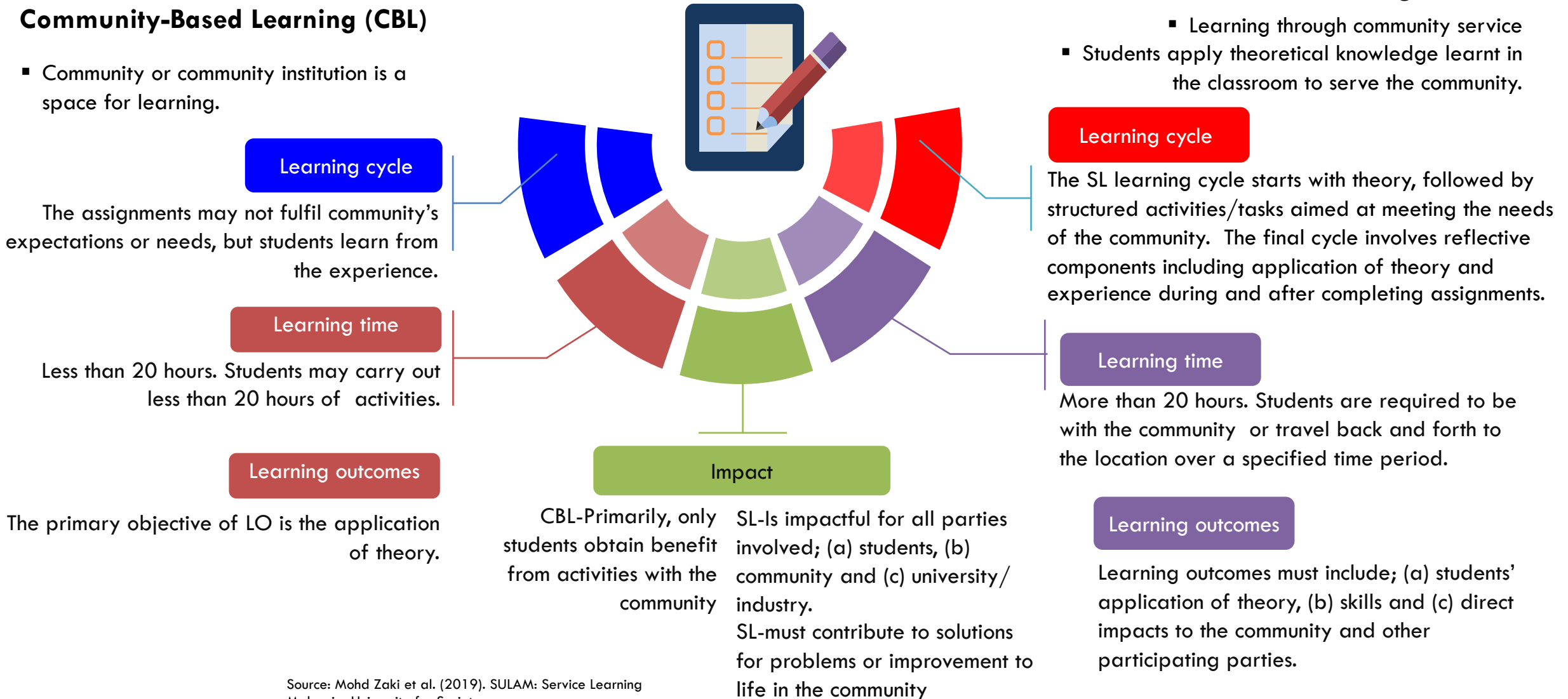
The SL learning cycle starts with theory, followed by structured activities/tasks aimed at meeting the needs of the community. The final cycle involves reflective components including application of theory and experience during and after completing assignments.

Learning time

More than 20 hours. Students are required to be with the community or travel back and forth to the location over a specified time period.

Learning outcomes

Learning outcomes must include; (a) students' application of theory, (b) skills and (c) direct impacts to the community and other participating parties.



Source: Mohd Zaki et al. (2019). SULAM: Service Learning Malaysia, University for Society.

Program Integrasi Sarjana Muda dan Sarjana



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KETUA PEGAWAI EKSEKUTIF
(Chief Executive Officer)
AGENSI KELAYAKAN MALAYSIA
(Malaysian Qualifications Agency)
Mercu MQA
No. 3539, Jalan Teknokrat 7, Cyber 5
63000 Cyberjaya
Selangor Darul Ehsan

NO GIFT POLICY

Ruj. Kami : MQA.100-1/7/2 Jld. 2 (22)

Tarikh : 17 Julai 2019

KEPADA SEMUA PEMBERI PENDIDIKAN TINGGI (PPT)

Tuan/Puan,

SURAT MAKLUMAN MQA BIL. 6/2019

PROGRAM INTEGRASI SARJANA MUDA TAHAP 6 MQF DAN SARJANA TAHAP 7 MQF

Dengan hormatnya saya merujuk kepada perkara di atas.

2. Agensi Kelayakan Malaysia (Malaysian Qualifications Agency, MQA) sentiasa menyokong inovasi ke arah pendidikan fleksibel termasuk dari segi kesinambungan laluan pendidikan dan pembangunan kurikulum tersedia masa hadapan.

3. Justeru, MQA memperkenalkan konsep integrasi yang membolehkan **kursus teras** dalam program Sarjana Tahap 7 (Malaysian Qualifications Framework, MQF) ditawarkan sebagai **kursus elektif bebas** dalam program Sarjana Muda Tahap 6 MQF.

4. Konsep ini diyakini dapat memberi motivasi kepada pelajar Sarjana Muda untuk menyambung pengajian ke peringkat pascasiswazah dan seterusnya dapat meningkatkan enrolmen pelajar pascasiswazah tempatan dan antarabangsa dalam Pemberi Pendidikan Tinggi (PPT) di Malaysia.

5. Pembangunan dan pelaksanaan program integrasi ini diperincikan seperti dalam **Lampiran 1**.

6. Diharapkan agar konsep integrasi ini dimanfaatkan sepenuhnya oleh PPT yang secara langsung akan menyumbang kepada pengayaan variasi pengendalian program pengajian dan jaminan kualiti pendidikan tinggi negara.

A. PEMBANGUNAN PROGRAM INTEGRASI SARJANA MUDA

| BIL. | PERKARA | KETETAPAN |
|------|--|---|
| 1. | Body of Knowledge (BoK) program Sarjana Muda | BoK hendaklah memenuhi keperluan bidang program Sarjana Muda yang berkaitan. Kursus-kursus teras program Sarjana Tahap 7 MQF boleh ditawarkan sebagai kursus elektif bebas pada tahun akhir program Sarjana Muda hanya setelah kesemua keperluan minimum BoK pada tahap Sarjana Muda dipenuhi oleh pelajar. |
| 2. | Tempoh pengajian program Sarjana Muda | Tempoh pengajian adalah berdasarkan kesesuaian kredit bergraduat program Sarjana Muda. |
| 3. | Kelayakan masuk ke program Sarjana | Pelajar yang melanjutkan pengajian ke peringkat Sarjana hendaklah telah memperoleh kelayakan Sarjana Muda (memenuhi keperluan kredit bergraduat). |
| 4. | Mod penawaran program Sarjana | Mod yang dibenarkan untuk integrasi ialah Mod Kerja Kursus dan Mod Campuran sahaja. |
| 5. | Pindah kredit | Pindah kredit dibenarkan sebanyak 30% (secara <i>vertical</i>) daripada jumlah kredit bergraduat program Sarjana yang akan diikuti. |
| 6. | Kesinambungan kursus Projek bagi Sarjana Muda ke Sarjana | Kursus Projek bagi program Sarjana Muda boleh dilanjutkan semasa mengikuti program Sarjana berdasarkan kelulusan penyelia. |

Membolehkan **Kursus Teras dalam Program Sarjana** (Tahap 7 MQF) ditawarkan sebagai **Kursus Elektif Bebas dalam Program Sarjana Muda** (Tahap 6 MQF)

REFLECTION

Q & A

and Feedback

Learning Outcomes

LEARNING DOMAINS

- Numeracy Skill PO10
- Cognitive Skill PO3
- Knowledge & understanding PO1

| | | | |
|---------------------------------------|-------------------------------|--------------------------------|----------------------|
| Communication Skill PO4 | Interpersonal/ Team Skill PO5 | Ethics & Professionalism PO6 | Personal Skills LO9 |
| Personnel Skill & Entrepreneurial PO8 | Leadership Skill PO9 | Digital Skills & Life long PO7 | Practical Skills PO2 |

Cognitive

Affective

Psychomotor/skills

Higher order

lower order

- Create
- Evaluate
- Analyze
- Apply
- Understand
- Remember

- Internalising values
- Organisation
- Valuing
- Responding
- Receiving

- Origination
- Adaptation
- Complex Overt Response
- Mechanism
- Guided Response
- Set
- Perception

Bloom, 2001

Krathwohl, 1964

Simpson, 1972

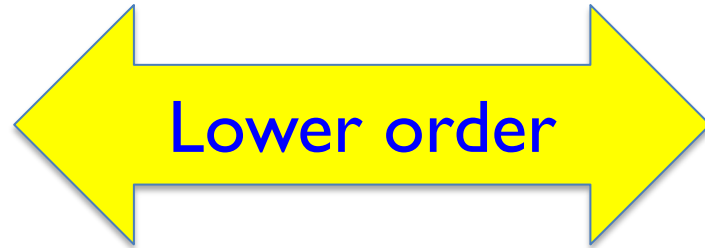
Issue 1: How is Bloom's Taxonomy of Learning Domain correlate with MQF v2 LO Domains?

| MQF Learning Outcome Domains (LOD) | MQF LO Clusters | MQF 1 st Ed. LOD | Bloom's Taxonomy |
|---|-----------------|--|----------------------|
| Knowledge and Understanding | 1-PO1 | Knowledge | Cognitive –LOTS-HOTS |
| Cognitive Skills | 2-PO3 | Scientific methods, critical thinking and problem solving skills | Cognitive-HOTS |
| Practical Skills | 3-PO2 | Practical Skills | Psychomotor |
| Communication Skills | 3-PO4 | Communication , teamwork and leadership skills | Affective |
| Interpersonal Skills | 3-PO5 | Social skills, and responsibility /Communication, teamwork and leadership skills | Affective |
| Digital Skills | 3-PO7 | Lifelong learning and Information management skills | Affective |
| Numeracy Skills | 3-PO10 | Scientific methods, critical thinking and problem solving skills | Cognitive-HOTS |
| Leadership, Autonomy and Responsibility | 3-PO9 | Communication, teamwork and leadership skills | Affective |
| Personal Skills | 4-PO8 | Lifelong learning and Information management skills | Affective |
| Entrepreneurial Skills | 4-PO8 | Entrepreneurial and Managerial skills | Affective |
| Ethics and Professionalism | 5-PO6 | Ethics, professionalism and humanities | Affective |

Behaviors from simple to complex

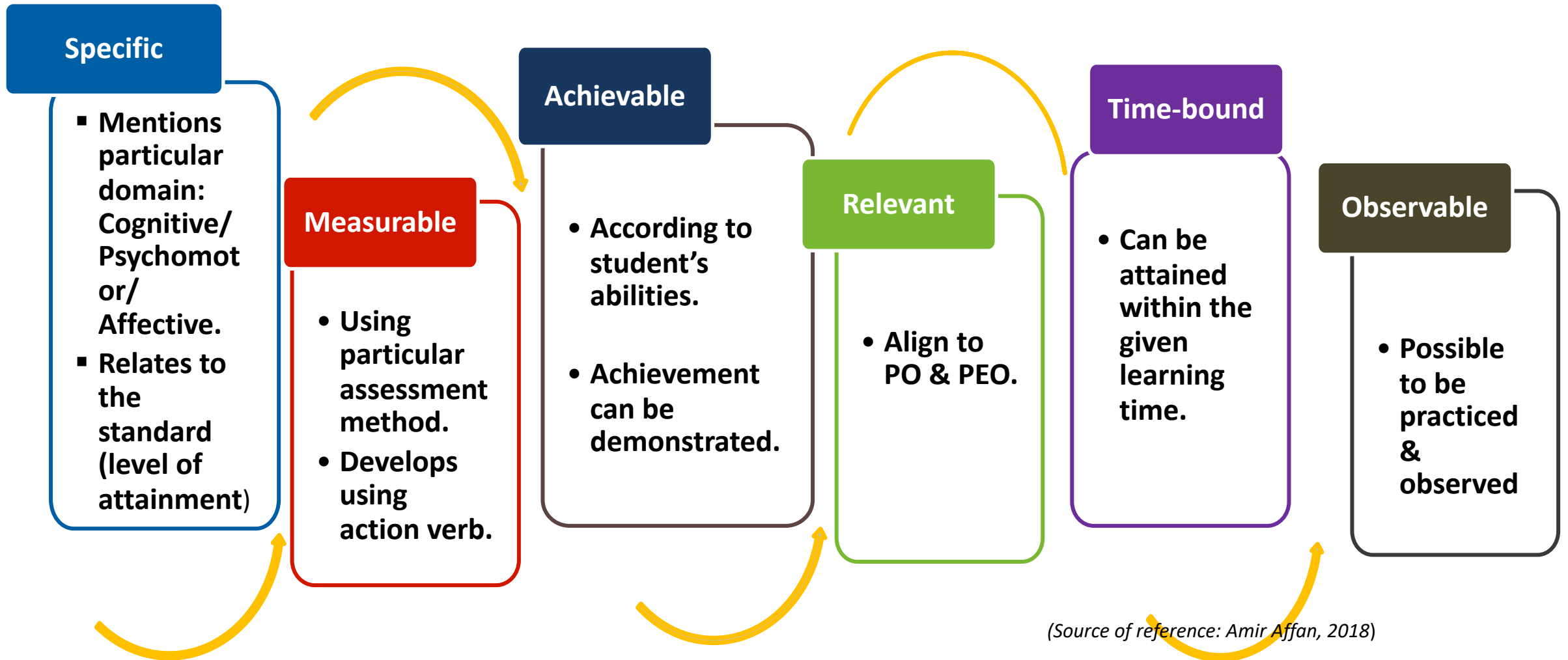
| C-Cognitive (Mental activity) | A-Affective (Character and conscience) | P-Psychomotor (Physical activity) |
|---|---|---|
| C6-Creating (compose, originate, design, invent) | A5-Characterizing (revise, require, rate, avoid, resist, manage, resolve) | P7-Originating (arrange, build, construct, initiate) |
| C5-Evaluating (judge, criticize, evaluate, appraise, recommend) | A4-Organizing (discuss, theorize, formulate, balance, prioritize) | P6-Adapting (alter, rearrange, vary, revise) |
| C4-Analyzing (compare, classify, rank, infer, extrapolate) | A3-Valuing (measure, proficiency, subsidize, support, debate) | P4-Mechanizing and P5-Complex Overt Response (assemble, calibrate, fasten, measure, mend) |
| C3-Appling (organize, solve, generalize, product) | A2-Responding (comply, follow, commend, volunteer, acclaim, engage in) | P3-Guided Responding (copy, trace, reproduce, react) |
| C2-Understanding (explain, infer, interpret, summarize, paraphrase) | A1-Receiving (differentiate, accept, listen for, responded to) | P2-Setting (begin, move, show, state) |
| C1-Remembering (recite, quote, list, define) | | P1-Perceiving (choose, identify, relate, select) |

Knowledge (C), skills (P) and behaviors (A)



| | | | | | | | |
|-----------|-------------------------|-------------------------|-----------------------|---------------------------|---|-------------------------|--------------------------|
| Cognitive | C1 Remember | C2 Understand | C3 Apply | C4 Analyze | C5 Evaluate | C6 Create | |
| | P1 Perception | P2 Set | P3 Response | P4 Mechanism | P5 Complex Overt Response | P6 Adaptation | P7 Origination |
| | A1 Receiving | A2 Responding | A3 Valuing | A4 Organization | A5 Internalizing | | |

GOOD LEARNING OUTCOMES CRITERIA



Characteristics of a Good Course Outcome

- should be mapped to the learning domain in Blooms or other Taxonomy.
- Must state the **major** skills, knowledge, attitude or ability that students will acquire.
- expressed in terms of measurable and/or observable behaviors (*hint: ask yourself how you would test the outcome*).
- Each course will usually have between **3 and 5 major outcomes**. (Garis panduan Penulisan Akademik, JPT, KPM)
- Begin with an action verb (e.g., write, install, solve, and apply).

GOOD LEARNING OUTCOMES

1) **Action verb** (describes what the learner will be doing, or the behaviour)

By the end of this course/semester, students are able to:

- describe the principles used in designing XXX.
- evaluate the strengths and weakness of ...

2) **Condition** (context under which the behaviour is to occur)

- describe the principles used in designing X. (V)
- orally describe the principles used in designing X. (V&C)

- design a beam. (V)
- design a beam using Microsoft Excel design template. (V&C)

3) **Criteria/Standard/Competency level** (criteria of acceptable level of performance)

- describe the principles used in designing X. (V)
- orally describe the principles used in designing X. (V&C)
- orally describe the five principles used in designing X. (V&C&S)

- design a concrete beam. (V)
- design a concrete beam using Microsoft Excel design template. (V&C)
- design a beam using Microsoft Excel design template based on BS 5950:Part 1. (V&C)

Note for writing CO

- It is **NOT compulsory** for every CLO to have all 3 learning domains (**C, A, P**)

- **CANNOT** have 2 “verbs” in the same domain (e.g. state and explain the basic principles....), use the highest level of taxonomy only (i.e. explain the basic principles...)

- Achievement of LOTS and HOTS has to be **differentiated**, but **LOTS have to be achieved first before achieving HOTS**

- It is **NOT compulsory** for every CLO to have all 3 components (i.e. V+C+S)
- **But must have at least V+C or V+S**

REFLECTION

Q & A

and Feedback

JADUAL 2: PEMETAAN MATLAMAT PROGRAM DENGAN HASIL PEMBELAJARAN PROGRAM

| Matlamat Program | | Hasil Pembelajaran Program | | | | | | |
|------------------|---|---|---|--|---|--|--|--|
| | | mengaplikasi dan mengintegrasikan pengetahuan berkenaan isu penyelidikan semasa dalam pengkomputeran dan menghasilkan kerja yang mendepani pembangunan dalam domain program pengajian | menilai dan menganalisa penyelesaian pengkomputeran dari segi kebolegunaan, kecekapan dan keberkesannya | membangun penyelesaian pengkomputeran dan penggunaan alat yang perlu untuk menganalisa prestasinya | mengaplikasi teknik penyelidikan sedia ada untuk memperoleh, menterjemah dan meluaskan pengetahuan dalam pengkomputeran | berkomunikasi dan berfungsi dengan berkesan dalam kumpulan | menyediakan, menerbitkan dan membentangkan bahan teknikal kepada audiens yang pelbagai | mempamerkan tingkah laku yang konsisten dengan kod etika profesional dan tanggungjawab |
| | | CPS1 | CPS2 | CPS3 | CPS4 | CPS5 | CPS6 | CPS7 |
| | | PO1 | PO3 | PO2 | PO7 | PO5 | PO4 | PO6 |
| | | C | CTPS, NS | P | LL | TS, LS | CS | EM |
| PEO1 | melahirkan profesional sains komputer yang berkemahiran tinggi dalam aspek teori dan praktikal serta berdaya saing dalam bidang Sains Komputer; | ✓ | ✓ | ✓ | | | | |
| PEO2 | melahirkan profesional sains komputer yang mempunyai kemahiran interpersonal, kebolehan menyelia, komunikasi berkesan serta pembelajaran sepanjang hayat; | | | | ✓ | ✓ | ✓ | |
| PEO3 | mempamer sikap profesional serta beretika dalam menangani isu dan permasalahan dalam organisasi dan masyarakat | | | | | ✓ | | ✓ |

Pemetaan Kursus Dengan Taksonomi Pembelajaran (Rujuk Revised Bloom Bloom's Taxonomy, Anderson & Krathwohl (2001)#)

| BIL | Kursus | Kod Kursus | Nama Kursus | Kredit | ARAS TAKSONOMI PEMBELAJARAN | | | | | | | | | | | | | | | | | | | |
|--|--------|------------|-------------|--------|-----------------------------|----------|--------------|--------------|---------|----------|-------------------|-----|------------------|-----------|-------------------------|----------|--------------|----------------|----------------------|---------|----------------|------------------|--|--|
| | | | | | DOMAIN KOGNITIF | | | | | | DOMAIN PSIKOMOTOR | | | | | | | DOMAIN AFEKTIF | | | | | | |
| | | | | | Menghafal | Memahami | Mengaplikasi | Menganalisis | Menilai | Mencipta | Persepsi | Set | Respons berpandu | Mekanisme | Respons ketara kompleks | Adaptasi | Lakuan tulen | Menerima | Memberi maklum balas | Menilai | Mengorganisasi | Menghayati nilai | | |
| C1 | C2 | C3 | C4 | C5 | C6 | P1 | P2 | P3 | P4 | P5 | P6 | P7 | A1 | A2 | A3 | A4 | A5 | | | | | | | |
| KURSUS UNIVERSITI | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | |
| KURSUS TERAS | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | |
| KURSUS ELEKTIF | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | |
| Jumlah Kursus yang Mencapai Aras Tertinggi bagi Setiap Domain # | | | | | 0 | 0 | 15 | 17 | 11 | 2 | 0 | 2 | 7 | 10 | 10 | 5 | 1 | 0 | 8 | 16 | 5 | 1 | | |
| Peratus kursus mengikut domain | | | | | 45/45 (100%) | | | | | | 35/45 (77.8%) | | | | | | | 30/45 (66.7%) | | | | | | |
| Purata Pencapaian Domain | | | | | 4.00 | | | | | | 4.34 | | | | | | | 2.97 | | | | | | |

Jumlahkan bilangan kursus yang menyumbang kepada **aras tertinggi** bagi setiap domain. Untuk kursus elektif, kira jumlah berdasarkan kursus yang popular dalam kalangan pelajar untuk memenuhi keperluan kredit.

*Contoh pengiraan purata pencapaian domain:

| | C1 | C2 | C3 | C4 | C5 | C6 | P1 | P2 | P3 | P4 | P5 | P6 | P7 | A1 | A2 | A3 | A4 | A5 |
|---------------------------------------|--------------|----|----|----|----|----|---------------|----|----|----|----|----|---------------|----|----|----|----|----|
| Jumlah Kursus Mencapai Aras Tertinggi | 0 | 0 | 15 | 17 | 11 | 2 | 0 | 2 | 7 | 10 | 10 | 5 | 1 | 0 | 8 | 16 | 5 | 1 |
| | 45/45 (100%) | | | | | | 35/45 (77.8%) | | | | | | 30/45 (66.7%) | | | | | |

Domain Kognitif

$$\begin{aligned} &= [(1 \times 0) + (2 \times 0) + (3 \times 15) + (4 \times 17) + (5 \times 11) + (6 \times 2)] \div \text{jumlah kursus untuk domain kognitif} \\ &= 180/45 \\ &= 4.00 \text{ (Mencapai purata C4)} \end{aligned}$$

Domain Psikomotor

$$\begin{aligned} &= [(1 \times 0) + (2 \times 2) + (3 \times 7) + (4 \times 10) + (5 \times 10) + (6 \times 5) + (7 \times 1)] \div \text{jumlah kursus untuk domain psikomotor} \\ &= 152/35 \\ &= 4.34 \text{ (Mencapai purata P4)} \end{aligned}$$

Domain Afektif

$$\begin{aligned} &= [(1 \times 0) + (2 \times 8) + (3 \times 16) + (4 \times 5) + (5 \times 1)] \div \text{jumlah kursus untuk domain afektif} \\ &= 89/30 \\ &= 2.97 \text{ (Tidak Mencapai purata A3)} \end{aligned}$$

JADUAL 7: JUMLAH JAM PEMBELAJARAN PELAJAR (JJPP) PROGRAM

| Bil. | Kod Kursus | Nama Kursus | Kredit | Tahap Taksonomi Tertinggi (C, P, A) | Pembelajaran Bersemuka (PB) | | | | Aktiviti Pembelajaran Kendiri | | | Penilaian Formal | Jumlah JJPP |
|-----------------------|------------|--|----------|-------------------------------------|-----------------------------|------|----------------|------|--|-----------|----------------------|----------------------|-------------|
| | | | | | Kuliah | | Amali/Tutorial | | Pembelajaran Tak Bersemuka (PTB) atau SDL* spt. manual, tugas, modul, dll. | Ulangkaji | Persediaan Penilaian | Penilaian Berterusan | |
| | | | | | TCL* | SCL* | TCL* | SCL* | | | | | |
| MODUL TERAS | | | | | | | | | | | | | |
| 1. | SSK5090 | Kaedah Penyelidikan dalam Sains Komputer | 3(3+0) | C6, A4 | 30 | 12 | 0 | 0 | 44 | 30 | 3 | 1 | 120 |
| 2. | SSK5212 | Teknologi Data Raya | 3(3+0) | C5, P5, A4 | 27 | 15 | 0 | 0 | 47 | 27 | 3 | 1 | 120 |
| 3. | SSK5210 | Kaedah Empirikal dalam Sains Komputer | 3(3+0) | C5, P5 | 27 | 15 | 0 | 0 | 47 | 27 | 3 | 1 | 120 |
| 4. | SSK5221 | Internet Benda | 3(3+0) | C5, A4 | 30 | 12 | 0 | 0 | 44 | 30 | 3 | 1 | 120 |
| 5. | SSK5500 | Keselamatan dalam Pengkomputeran | 3(3+0) | C5, A4 | 30 | 12 | 0 | 0 | 44 | 30 | 3 | 1 | 120 |
| 6. | SSK5603 | Pembelajaran Mesin | 3(3+0) | C5, P6, A4 | 27 | 15 | 0 | 0 | 47 | 27 | 3 | 1 | 120 |
| 7. | SKR5306 | Rangkaian Komputer Lanjutan | 3(3+0) | C5, P5 | 27 | 15 | 0 | 0 | 47 | 27 | 3 | 1 | 120 |
| DISERTASI | | | | | | | | | | | | | |
| 8. | SSK5989 | Disertasi | 10(0+10) | C6, P6, A4 | 0 | 0 | 0 | 352 | 48 | 0 | 0 | 0 | 400 |
| KURSUS ELEKTIF | | | | | | | | | | | | | |
| 9. | SKR5302 | Pengkomputeran Teragih Lanjutan | 3(3+0) | C5, P6, A4 | 27 | 15 | 0 | 0 | 47 | 27 | 3 | 1 | 120 |

- ❖ Jumlah tajuk kuliah dan amali dalam kandungan kursus antara 8 hingga 12 tajuk.
- ❖ Senarai buku rujukan antara 3 hingga 5 buah buku dan 3 buku hendaklah menggunakan terbitan dalam 5 tahun terkini.
- ❖ Hasil pembelajaran yang ditulis pada rangka kursus hendaklah selari dengan LO, Taksonomi (CPA) dan JPP pada jadual yang telah disediakan

The nature of the unique mangrove plants can be attributed to the characteristic of the academic ecosystems aspired to be realized in UPM. These plants can adapt and survive in the dynamic environment of mudflat, sandy and rocky in marine and brackish waters during low and high tides.

Symbolic of Future-Proof PUTRA Graduates

Viviparous fruits or propagules that mature on the mother plant once they fall are capable of starting new lives. As the saying goes "a good seed thrown into the sea become an island" is a symbol of a **resilient future graduate** in facing many challenges.

2 The branches that hold the leaves rising to the sky capture the sunlight to produced their food are likened to **innovative teaching and learning delivery approaches** that fit the learning needs.

The strong stems with breathing pores allowing them to breathe in restricted environment of oxygen, especially during high tides is analogous to **human intellectuality or cognitive capability** of responding to knowledge for life-long use.

3 Leaves of various shapes and sizes are metaphorical to **alternative assessments** aimed at sharpening the effectiveness of the delivery and mastery of the knowledge of students with varying potentials and interests.

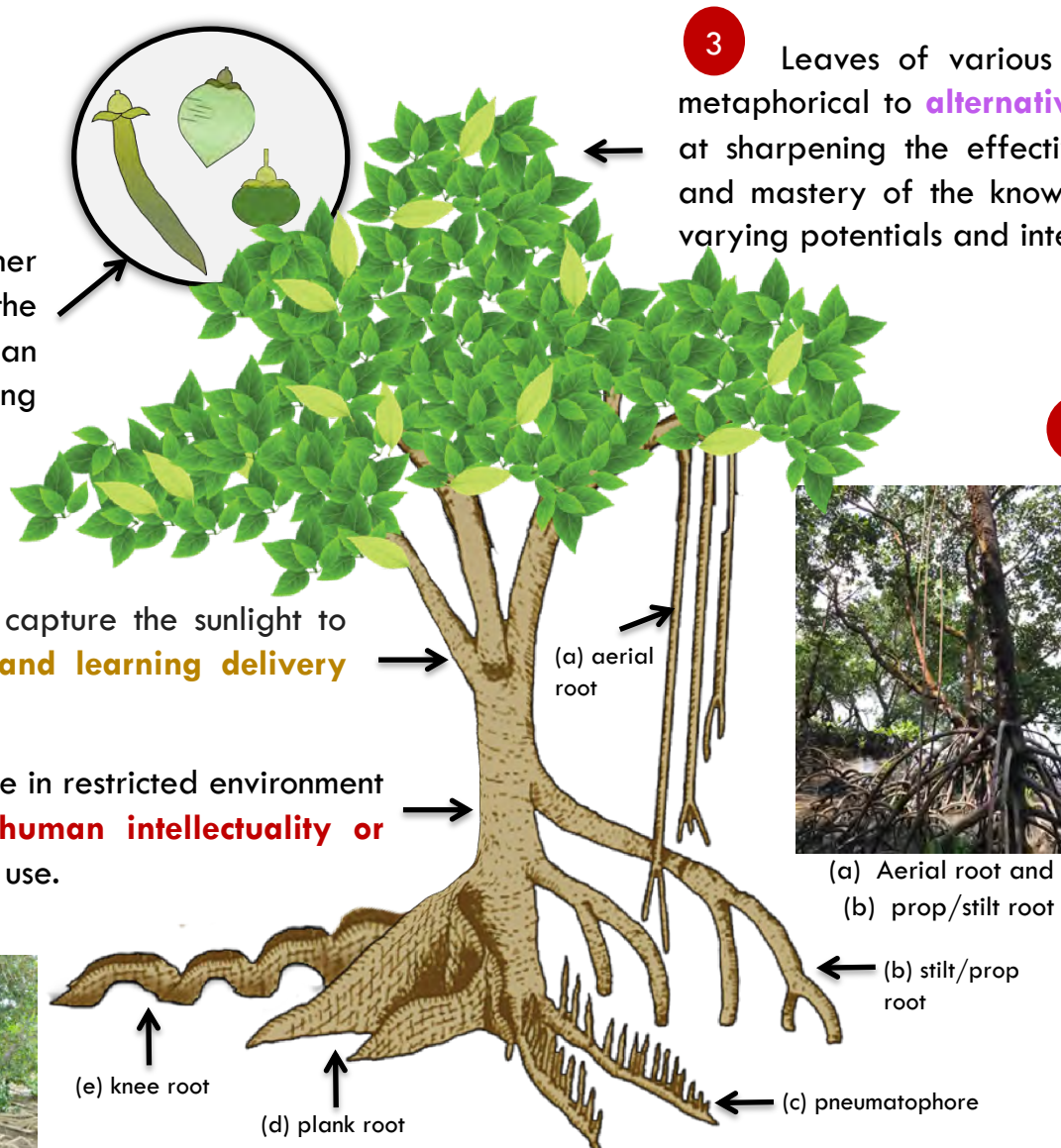
1 Various types of roots for support and breathing are analogous to knowledge which is **fundamental for a well-designed curriculum.**



(e) knee root



(d) plank root



(a) Aerial root and (b) prop/stilt root



(c) pneumatophore

Conclusions

TEAMWORK



1. OBE is a teamwork process – CLOs to PLOs to PEOs
2. CLO, PLO and PEO must be designed so that they can be measured
3. The ultimate aim of OBE is to produce “better” graduates

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