

Develop and Implement Properly Curriculum Revision Based on OBE Framework and AUN-QA Criteria

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Jack Ma gives speech at Hong Kong University, May 22, 2018

https://www.youtube.com/watch?v=fnk_e9MoyLY&feature=youtu.be

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The Rabbit and Turtle: A Tale of Missed Opportunities for Thailand?



Over the last 10 years, Thailand's global competitiveness score stood still in the following areas

Public and private institutions	Infrastructure	Higher education and training	Market labor efficiency	Innovation

SOURCE: Thailand Systematic Country Diagnostic 2016, World Bank
For more information, visit: www.worldbank.org/thailand



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Thailand's Shocking Stats!

7 Threats to the Nation's Growth

Instability

Political uncertainty is reducing investor confidence, since 1932 there were:

- 18 Constitutions
- 18 Coups
- 35 Prime Ministers

Inefficiency

Reduced Productivity

From 2010-2015, the industrial sector grew by just

1%

Declining from 12% in 1986-1996 while the agricultural sector has been growing slowly for more than 10 years

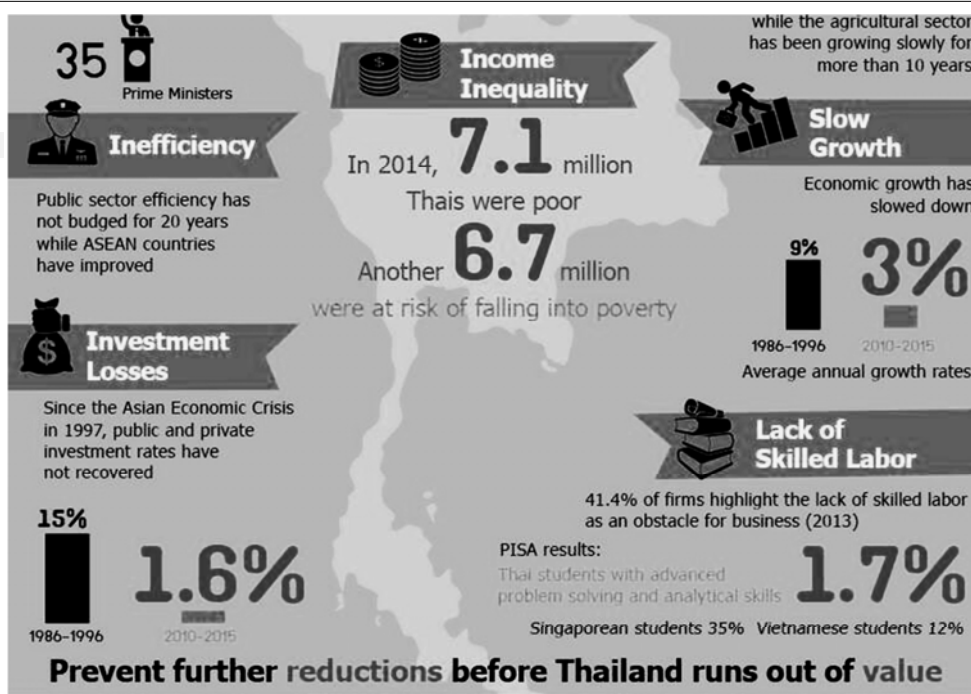
Slow Growth

Income Inequality

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THE BIG SALE

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SOURCE: Thailand Systematic Country Diagnostic 2016, World Bank
For more information, visit: www.worldbank.org/thailand



Graduates in 21st Century

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Number of HEIs (reference OHEC, 2016)

7

TOTAL: Higher Education Institutions (171)

- Public Universities (80) Having their own administrative structure and budgeting system
 - Autonomous Universities (15)
 - Universities (65)
- Private Higher Education Institutions (71)
 - Universities (40)
 - Institutions (9)
 - Colleges (22)

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Student Number

8

- Student number: 2,430,000 (reference year: 2011, source: UNESCO 2014)
- Incoming students: 20,155 (reference year: 2011, source: UNESCO 2014)
- Outgoing students: 25,195 (reference year: 2011, source: UNESCO 2014)

Student Number: OHEC

Year 2013 – 2,298,000
Year 2012 – 2,222,000
Year 2011 – 2,150,000

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National Education Reform 1999

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- The 1999 National Education Act Revised 2002:
Chapter 6 Educational Standards and Quality Assurance, Section 47: QA System IQA & EQA

QA System	Responsible Organization	Process
IQA	OHEC	Establishing IQA systems and undertaking internal reviews
EQA	ONESQA	Conducting external assessment

ONESQA - Office for National Education Standards and Quality Assessment



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Revolution of EQA

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- The first round of assessment (2001-2005):
8 standards and 28 indicators.
- The second round of assessment (2006-2010)
7 standards and 48 indicators.
- The third round of assessment (2011-2015)
6 standards and 18 indicators.
- The fourth round of assessment (2016-2020)
5 standards and 11 indicators.



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Internal Quality Assessment System

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IQA System	Assessment Level	Frequency
OHEC-QA	Uni / Fac level	OHEC - Annually
EdPEX	Uni / Fac level	Annually
*CUPT-QA	Uni / Fac level	?
OHEC-QA	Programme Level	OHEC - Annually
CUPT-QA	Programme Level	?
AACSB	Programme Level	International Accreditation
ABET	Programme Level	International Accreditation
WFME	Programme Level	International Accreditation

*CUPT = Council of University President of THAILAND



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Professional Bodies (16)

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- National professional council or
National professional committee
- Approve a programme (new/revision)
 - Professional certificate and/or
License for Professional Practice



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Thailand NQF, 2017.....TQF - V2

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- Align with AQRF (ASEAN Qualification Reference Framework)
- 3 Domains of Learning Outcomes
 - (1) Knowledge
 - (2) Skills
 - (3) Application and Responsibility
- 8 Educational Levels

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ASEAN Qualification Assurance Framework

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AQAF



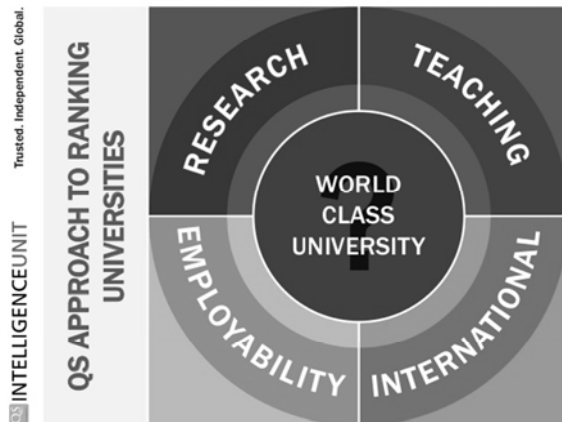
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BE PART OF A WORLD-CLASS UNIVERSITY

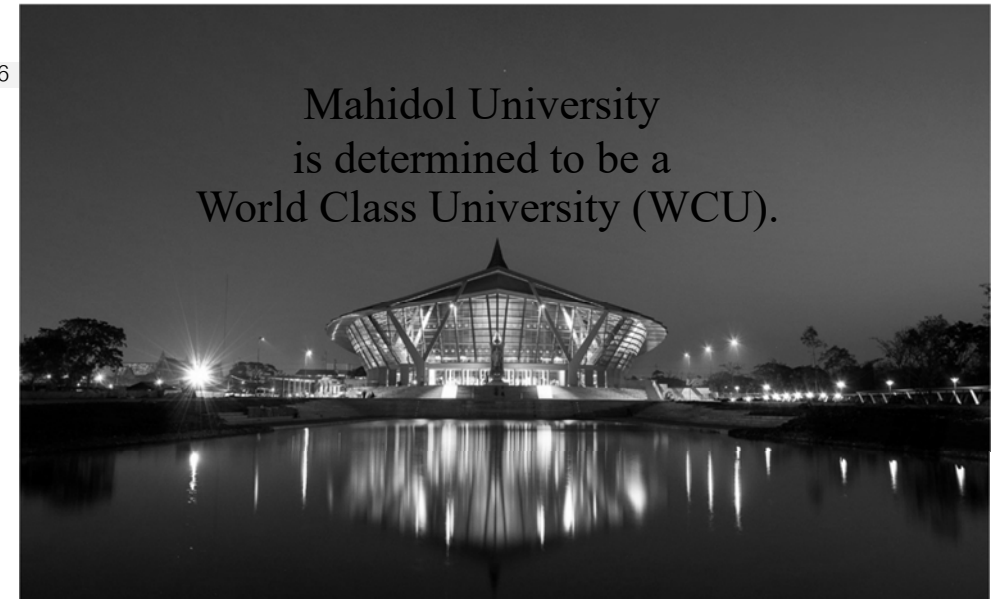


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Mahidol University is determined to be a World Class University (WCU).

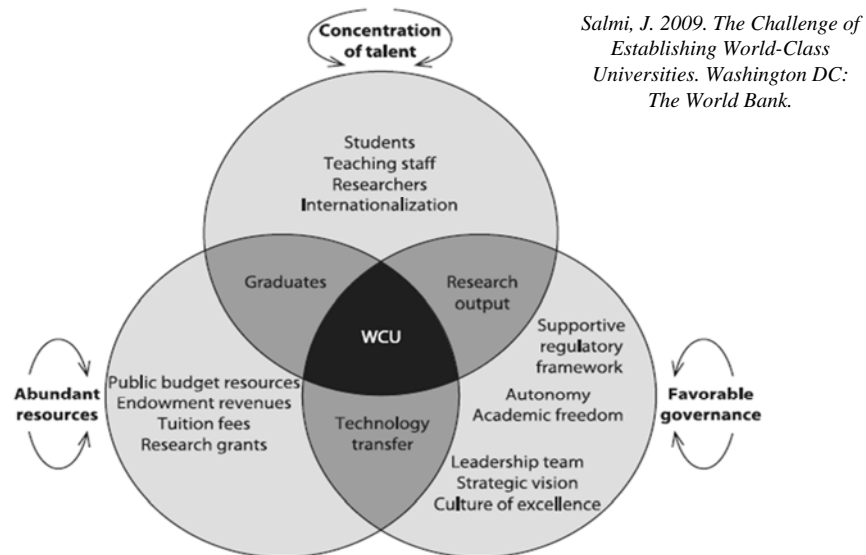


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Mahidol University is determined to be a World Class University (WCU)

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Source: Created by Jamil Salmi.



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MU-Quality Philosophy

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“External and Internal Quality Assessments is a tool to review and improve the quality of education programme, research and services of the institution.”



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WORKSHOP: Intended Learning Outcomes

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Curriculum Revision based on OBE Framework and AUN-QA Criteria: Development and Implementation

- **Formulate** and **Write** the statement of Expected Learning Outcomes (ELOs)
- **Curriculum Design** Using Backward design Technique
- **Translate** ELOs to programme structure and content
- **Formulate** properly the Course Learning Outcomes (CLOs)



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Workshop:

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- E1: Formulating Expected Learning Outcomes (ELOs)
- E2: Backward curriculum design
- E3: Construct a programme structure and curriculum map
- E4: Formulation of course learning outcomes (CLOs)

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What is outcome-based education?

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Outcome-based education (OBE)

is a **learner-centered** learning philosophy that focuses on measuring **students' performance** (the intended learning outcomes). OBE itself is **not a teaching style** or method, it is a principle for **designing your teaching** in an effective way that enables learning happen and helps **students to achieve the intended learning outcomes**. Therefore, what matters most in OBE is **"what is learnt"** rather than **"what is taught"**.

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<http://celt.ust.hk/learner-centered-course-design>



OBE Model

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"Product (ELOs) defines process (SCL)"

Harden RM, et.al. Med Teacher 21(1): 7-14, 1999

Expected Learning Outcomes (ELOs) is what the student should be able to know, understand and to do at the end of the programme.

SCL: "Student-Centered-Learning"

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OBE Concept

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Expected Learning Outcomes

Statements specifying what the learners will know and be able to do at the end of the programme.



Student-Centered Learning

Learning Activities

The teaching and learning methods which the teachers use to achieve each of the Learning Outcomes. Students will know exactly why they are being asked to engage in certain teaching and learning activities in their courses.

Assessments

An on-going process aims improving students' learning by measuring the learning outcomes they have achieved. Feedback will be given so that students know what they need to do in order to get better grades.

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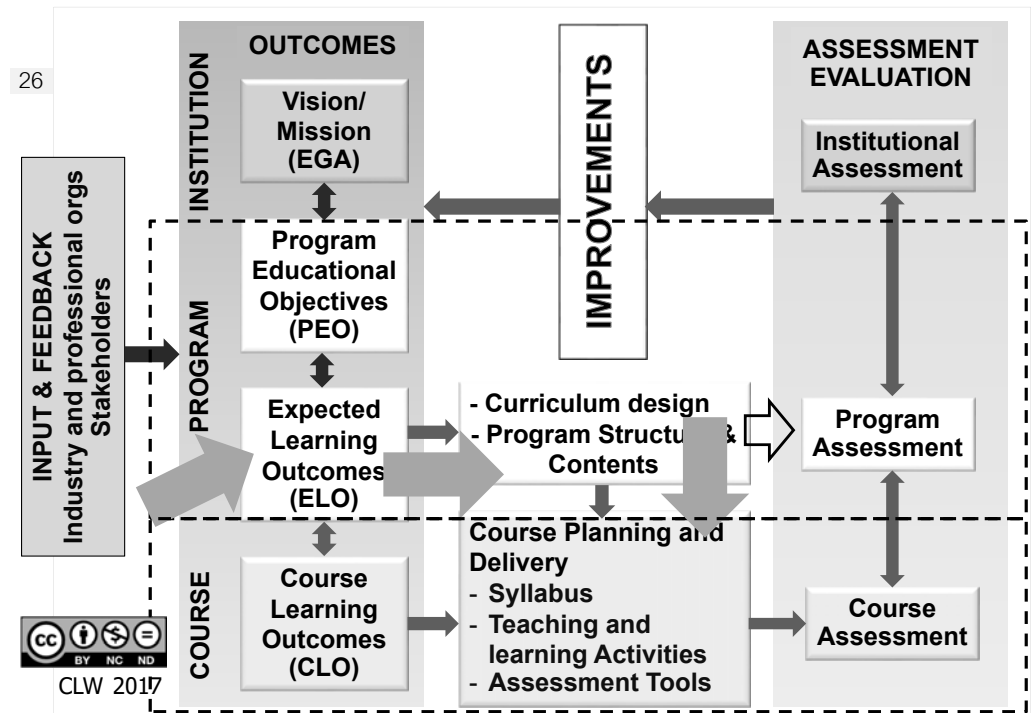
Key Concepts and Principles of OBE

25

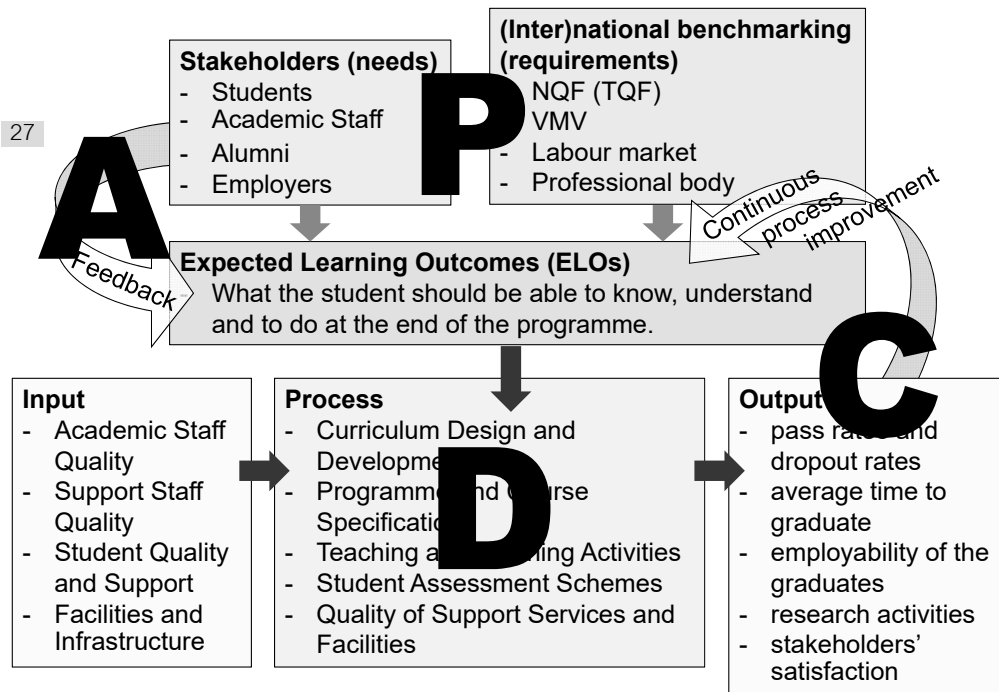
- **Focus on results of learning (ELOs)**
- **Backwards curriculum design** - design down (from the performances expected of graduates) and deliver up.
- **Create learning opportunities** to help different learners achieve learning outcomes
- **Design student assessment** to ensure that they are achieved all ELOs
- **Constructive alignment** (assessment – learning activities – learning outcomes)

An OBE Model

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AUN-QA Model at Programme Level

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- **Design based on OBE Framework**
- **PDCA Approach to Assessment**
- **Principles-based assessment system designed for Improvement to Best practice**

Guide to AUN Actual Quality Assessment at Programme Level (3rd Version, 2015)

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- Criteria and assessment process of AUN Actual Quality Assessment at Programme Level
- Associated resources (templates and samples)
- 3rd version will be effective from January 2017

http://www.aunsec.org/pdf/Guide%20to%20AUN-QA%20Assessment%20at%20Programme%20Level%20Version%203_2015.pdf

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Criteria

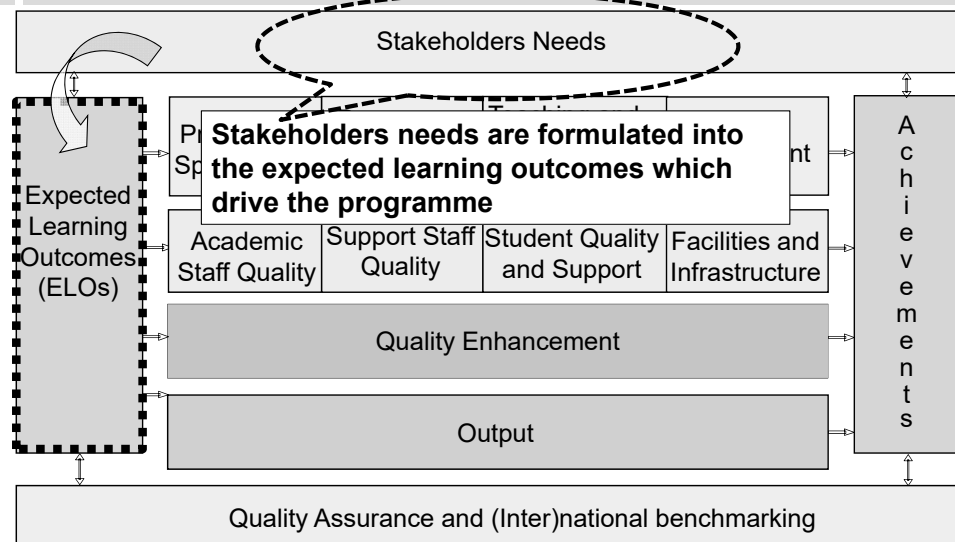
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1. Expected Learning Outcomes
2. Programme Specification
3. Programme Structure and Content
4. Teaching and Learning Approach
5. Student Assessment
6. Academic Staff Quality
7. Support Staff Quality
8. Student Quality and Support
9. Facilities and Infrastructure
10. Quality Enhancement
11. Output



Started with Expected Learning Outcomes

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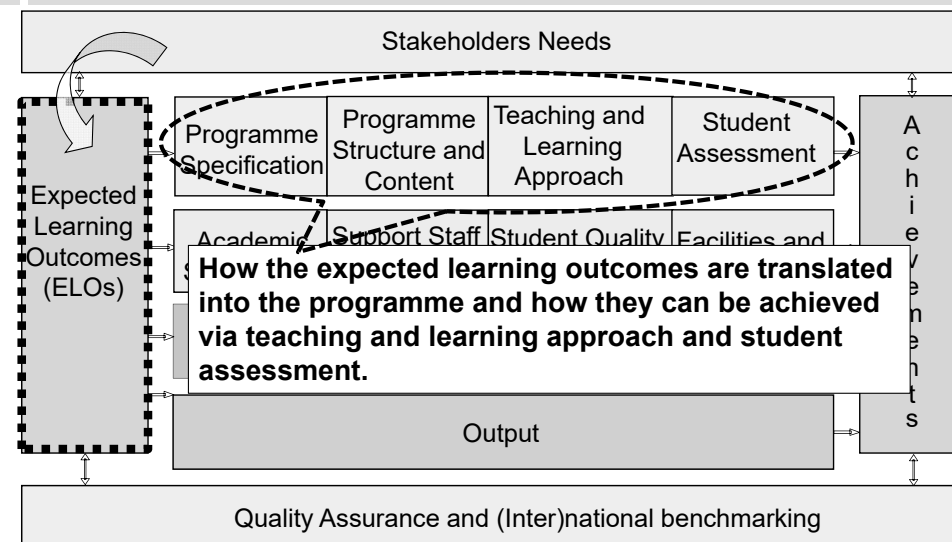


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The first row

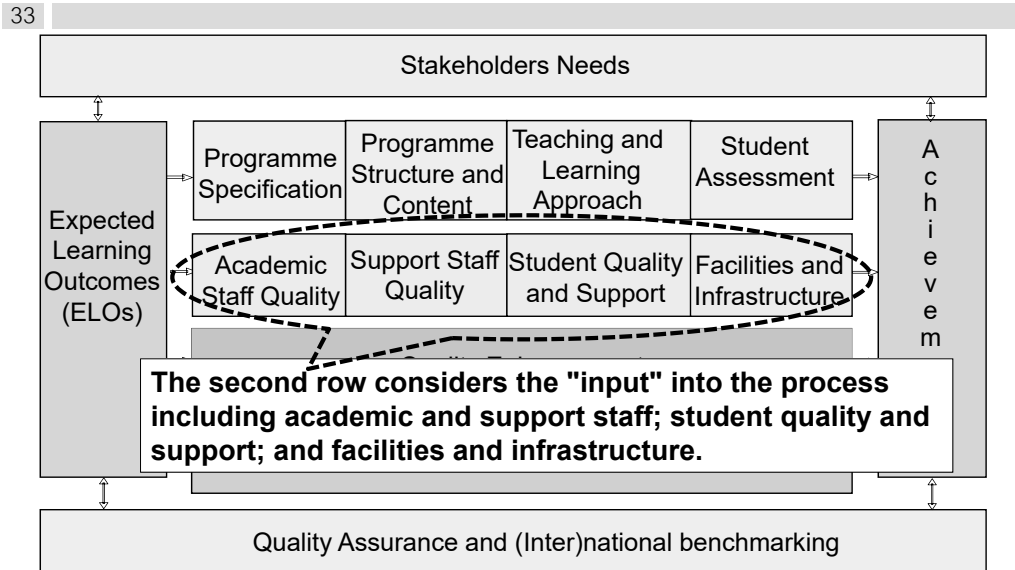
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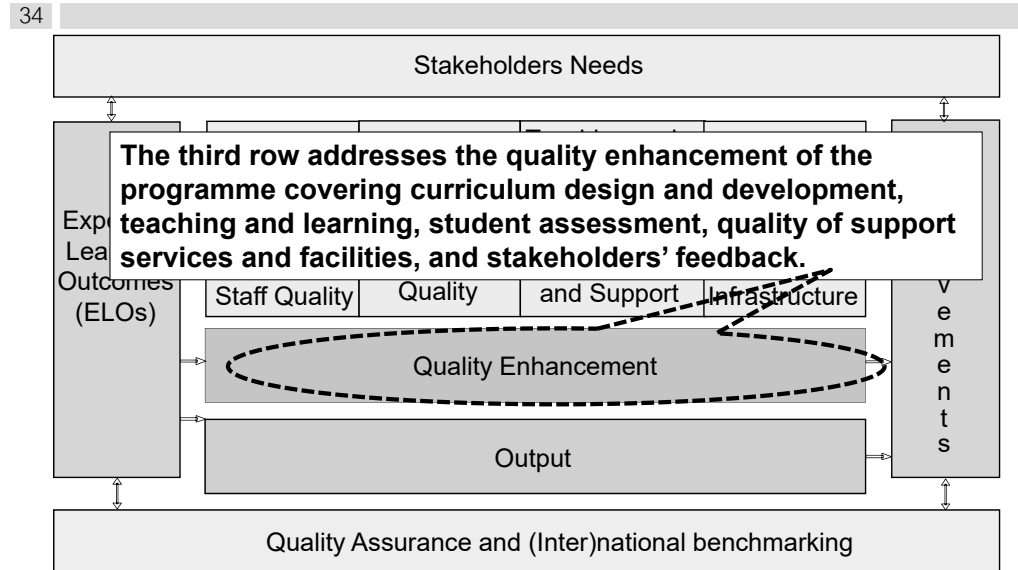
The second row



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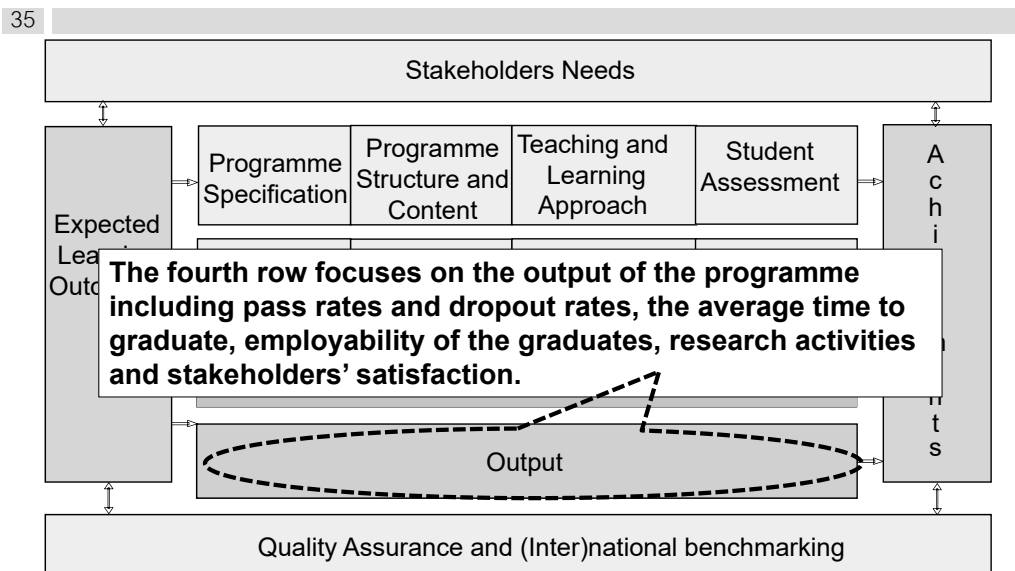
Third row



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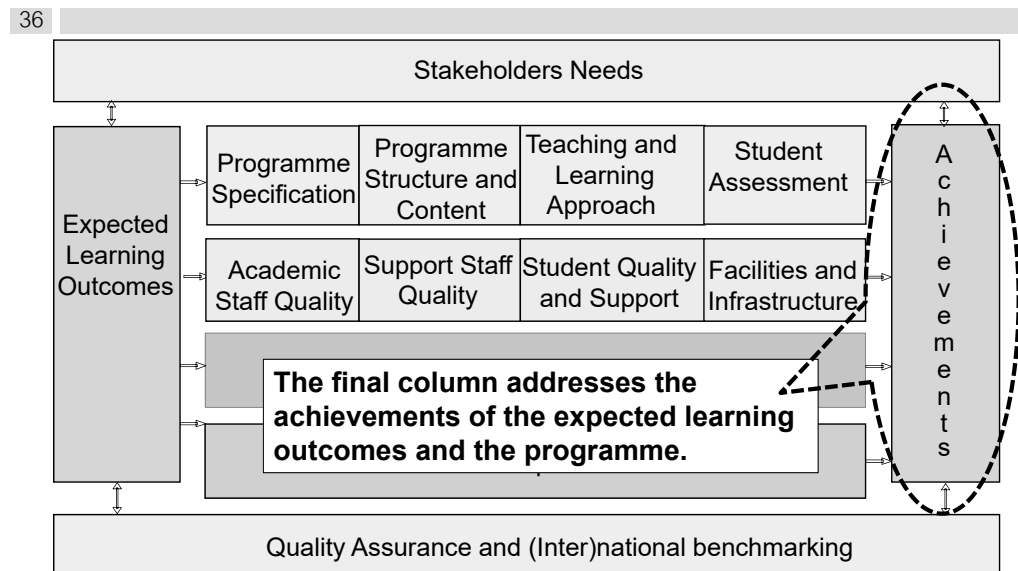
The fourth row



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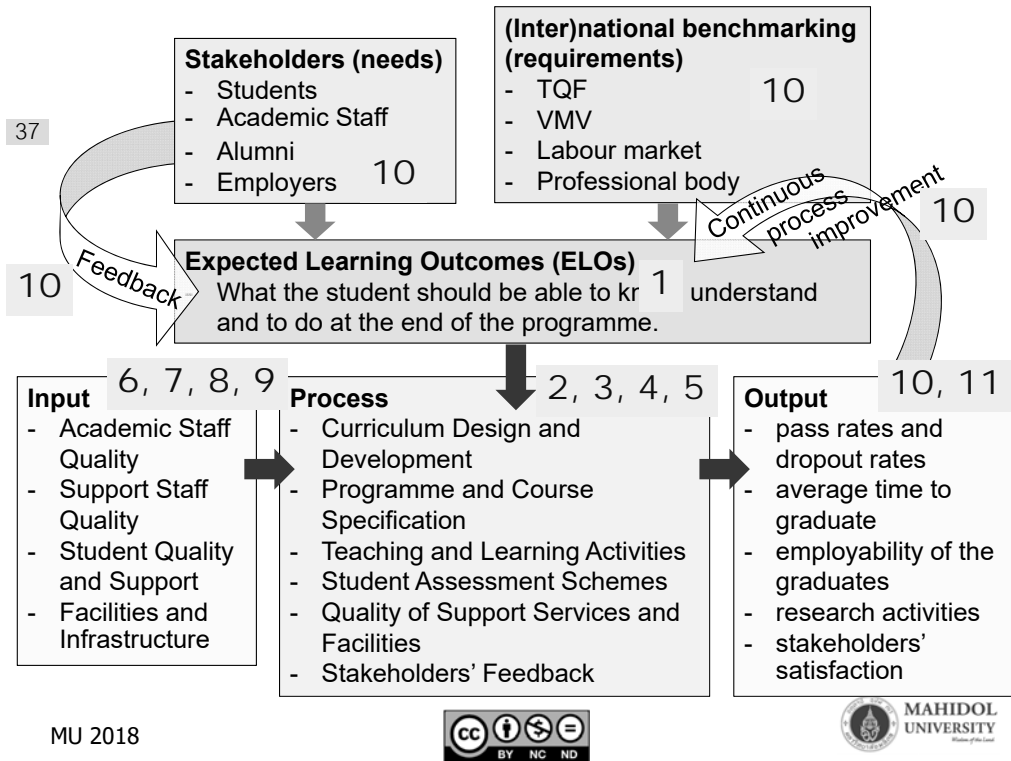


The final column



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Relationship of Criteria and Tasks

1. Expected Learning Outcomes
2. Programme Specification
3. Programme Structure and Content
4. Teaching and Learning Approach
5. Student Assessment
6. Academic Staff Quality
7. Support Staff Quality
8. Student Quality and Support
9. Facilities and Infrastructure
10. Quality Enhancement
11. Output

Curriculum - 1, 2, 3, 10

Teaching & Learning –
4, 5, 6, 9, 10

Resources - 6, 7, 8, 9, 10

Stakeholders - 8, 11

Five steps in a curriculum design based on OBE

5 Basic steps in a curriculum design based on OBE

1. Clearly defining the Expected Learning Outcomes
2. Backward Curriculum designed to align with ELOs
3. Construct Program Structure and Content that the sequence and integration are achieved.
4. Construct appropriate Course Syllabus that the alignment of CLOs with ELOs and constructive alignment of each course are achieved.
5. Review Program Constructive Alignment to ensure the ELOs can be achieved

How to formulate Expected Learning Outcomes (ELOs)?



Others Name of Learning Outcomes

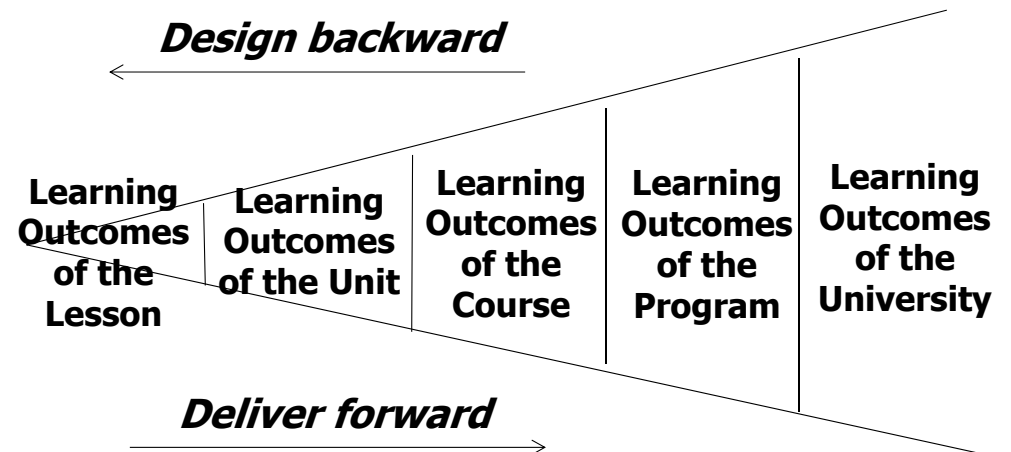
- At a **programme level**
 - Student Learning Outcomes, SLOs (USA)
 - Expected Learning Outcomes, ELOs (AUN)
 - Intended Learning Outcomes, ILOs
 - Programme Learning Outcomes, PLOs
- At a **course level**
 - Course Learning Outcomes, CLOs
 - Course Intended Learning Outcomes, CILOs

Learning Outcomes for HE Students

Reginal Level → AQRF → 3 domains, 8 level
 National level → NQF → 3 domains, 8 levels
 National/International Accreditation Requirements

- **University level → GAs**
 What are the attributes of an ideal graduate of the University?
- **Programme level → ELOs, ILOs, SLOs**
 What are the intended learning outcomes for students enrolled in the programme?
- **Course/Subject/Module/Unit level**
 What are the intended learning outcomes for students taking a particular course/subject/module/unit at a particular level within the programme?

Designing and Delivering Learning Outcomes



Expected learning outcomes

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- The ELO (Student Learning Outcomes) is the starting point of the Curriculum design and improvement.
- ELO is what the student should be able **to know**, **understand** and **to do** at the end of the programme.
- EOLs should be formulated from the requirements of the stakeholders.
- ELOs should be written in a way where **learning is translated into observable and measurable results which can be demonstrated and assessed**.

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Learning Outcomes (EQF 2008)

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- Learning outcomes means statements of what a learner **knows**, **understands** and is **able to do** on completion of a learning process, which are **defined in terms of knowledge, skills and competence**.

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Student Outcomes (ABET 2017-2018)

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Student outcomes describe what **students are expected to know and be able to do** by the time of graduation. These relate to the **skills, knowledge, and behaviors** that students acquire as they progress through the program.

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- 48 • **Knowledge** means the body of facts, principles, theories and practices that is related to a field of work or study.
- **Skills** means the ability to apply knowledge and use know-how to complete tasks and solve problems. Skills are described as cognitive (involving the use of logical, intuitive and creative thinking) or practical (involving manual dexterity and the use of methods, materials, tools and instruments).

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- 49
- **Competence** means the proven ability to use knowledge, skills and personal, social and/or methodological abilities, in work or study situations and in professional and personal development.

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Thailand NQF, 2017.....TQF - V2

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- Align with AQRF (ASEAN Qualification Reference Framework)
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 - (1) Knowledge
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- 8 Educational Levels

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ASEAN Qualifications Reference Framework, AQRF

<http://asean.org/storage/2017/03/ED-02-ASEAN-Qualifications-Reference-Framework-January-2016.pdf>

- The AQRF is based on broad level descriptors (2 domains) which include eight levels of complexity of learning outcomes.
- The level descriptors include the **notion of competence**, which is the ability that extends beyond the possession of knowledge and skills. It includes:
 - *Cognitive competence*
 - *Functional competence* (skills or know-how)
 - *Personal competence*
 - *Ethical competence*

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AQRF

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The **level descriptors** include **two** domains

- **Knowledge and Skills**
- **Application and Responsibility**

The Knowledge and Skills domain includes the various kinds of knowledge such as facts and theories as well as the skills used, such as practical and cognitive skills.

The Application and Responsibility domain defines the context in which the knowledge and skills are used in practice as well as the level of independence including the capacity to make decisions and the responsibility for oneself and others.



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	Knowledge and Skills	Application and Responsibility
	<i>Demonstration of knowledge and skills that:</i>	<i>The contexts in which knowledge and skills are demonstrated:</i>
54	<p>Level 8</p> <ul style="list-style-type: none"> • is at the most advanced and specialised level and at the frontier of a field • involve independent and original thinking and research, resulting in the creation of new knowledge or practice 	<ul style="list-style-type: none"> • are highly specialised and complex involving the development and testing of new theories and new solutions to resolve complex, abstract issues • require authoritative and expert judgment in management of research or an organisation and significant responsibility for extending professional knowledge and practice and creation of new ideas and or processes.
	<p>Level 7</p> <ul style="list-style-type: none"> • is at the forefront of a field and show mastery of a body of knowledge • involve critical and independent thinking as the basis for research to extend or redefine knowledge or practice 	<ul style="list-style-type: none"> • are complex and unpredictable and involve the development and testing of innovative solutions to resolve issues • require expert judgment and significant responsibility for professional knowledge, practice and management
	<p>Level 6</p> <ul style="list-style-type: none"> • is specialised technical and theoretical within a specific field • involve critical and analytical thinking 	<ul style="list-style-type: none"> • are complex and changing • require initiative and adaptability as well as strategies to improve activities and to solve complex and abstract issues

Learning Outcomes of Bachelor Degree specified in AQF

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Australian Qualifications Framework Second Edition January 2013
<https://www.aqf.edu.au/sites/aqf/files/aqf-2nd-edition-january-2013.pdf>

AQF level 7 criteria	
Summary	Graduates at this level will have broad and coherent knowledge and skills for professional work and/or further learning
Knowledge	Graduates at this level will have broad and coherent theoretical and technical knowledge with depth in one or more disciplines or areas of practice
Skills	Graduates at this level will have well-developed cognitive, technical and communication skills to select and apply methods and technologies to: <ul style="list-style-type: none"> • analyse and evaluate information to complete a range of activities • analyse, generate and transmit solutions to unpredictable and sometimes complex problems • transmit knowledge, skills and ideas to others
Application of knowledge and skills	Graduates at this level will apply knowledge and skills to demonstrate autonomy, well-developed judgement and responsibility: <ul style="list-style-type: none"> • in contexts that require self-directed work and learning • within broad parameters to provide specialist advice and functions



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Learning Outcomes of Masters Degree specified in AQF

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Australian Qualifications Framework Second Edition January 2013
<https://www.aqf.edu.au/sites/aqf/files/aqf-2nd-edition-january-2013.pdf>

AQF level 9 criteria	
Summary	Graduates at this level will have specialised knowledge and skills for research, and/or professional practice and/or further learning
Knowledge	Graduates at this level will have advanced and integrated understanding of a complex body of knowledge in one or more disciplines or areas of practice
Skills	Graduates at this level will have expert, specialised cognitive and technical skills in a body of knowledge or practice to independently: <ul style="list-style-type: none"> • analyse critically, reflect on and synthesise complex information, problems, concepts and theories • research and apply established theories to a body of knowledge or practice • interpret and transmit knowledge, skills and ideas to specialist and non-specialist audiences
Application of knowledge and skills	Graduates at this level will apply knowledge and skills to demonstrate autonomy, expert judgement, adaptability and responsibility as a practitioner or learner



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Learning Outcomes of Doctoral Degree specified in AQF

Australian Qualifications Framework Second Edition January 2013

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AQF level 10 criteria

Summary	Graduates at this level will have systematic and critical understanding of a complex field of learning and specialised research skills for the advancement of learning and/or for professional practice
Knowledge	Graduates at this level will have systemic and critical understanding of a substantial and complex body of knowledge at the frontier of a discipline or area of professional practice
Skills	Graduates at this level will have expert, specialised cognitive, technical and research skills in a discipline area to independently and systematically: <ul style="list-style-type: none">• engage in critical reflection, synthesis and evaluation• develop, adapt and implement research methodologies to extend and redefine existing knowledge or professional practice• disseminate and promote new insights to peers and the community• generate original knowledge and understanding to make a substantial contribution to a discipline or area of professional practice
Application of knowledge and skills	Graduates at this level will apply knowledge and skills to demonstrate autonomy, authoritative judgement, adaptability and responsibility as an expert and leading practitioner or scholar



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Categories of Learning Outcomes (AUN-QA)

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• **Specific outcomes:**

The outcomes that relate to the subject discipline and the knowledge, skills and/or competences particular to it.

• **Generic outcomes**

(sometimes called transferable skills)

The outcomes that relate to any and all disciplines e.g. written, oral, problem-solving, information technology, and team working skills, etc.



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QA at Programme Level

Generic learning outcomes (AQF)

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Generic learning outcomes are the transferrable, non discipline specific skills a graduate may achieve through learning that have application in study, work and life contexts. The four broad categories of generic learning outcomes recognised in the AQF are:

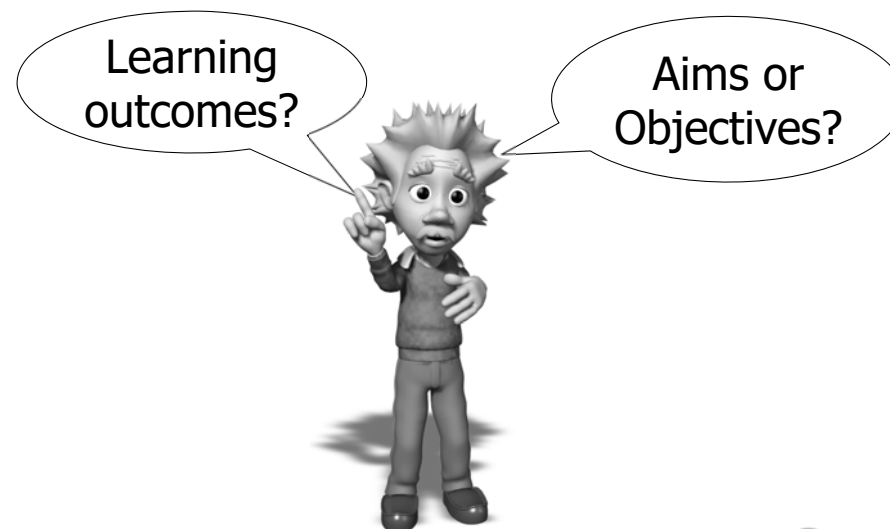
- **fundamental skills**, such as literacy and numeracy appropriate to the level and qualification type
- **people skills**, such as working with others and communication skills
- **thinking skills**, such as learning to learn, decision making and problem solving
- **personal skills**, such as self direction and acting with integrity.



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Aims (Goals), Objectives and LOs

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QA at Programme Level

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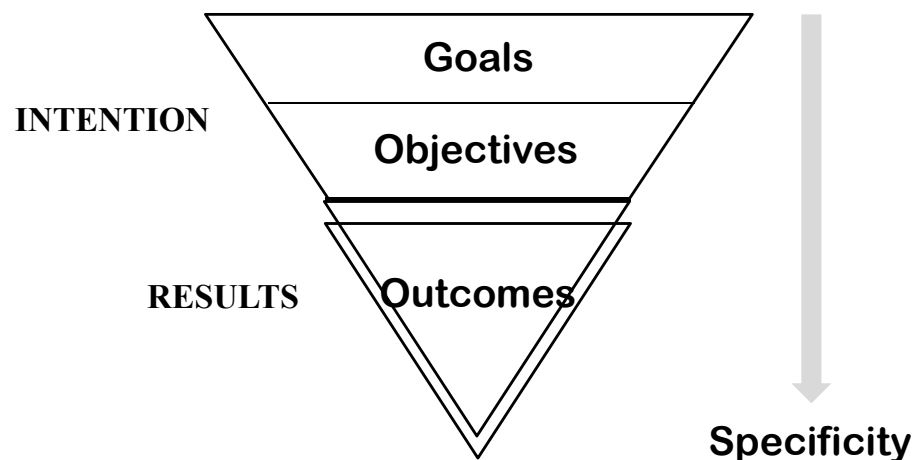
Aims (Goals), Objectives and LOs

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Aims (Goals) or objectives are more concerned with teaching, the teacher's intentions and the management of learning.

Learning outcomes are concerned with the achievements or results of the learner rather than the intentions of the teacher.

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Translate Goals (Aims) and Objectives to ELO

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Goals/Aim "To implement the undergraduate education to master the concepts of modern biology".

Objectives "To empower community through the application of modern biological innovations"

Learning outcome "Students should be able to **apply** the modern biological innovations underpinning the use of molecular biology to community.

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How do I change my Programme or Course Objectives to Learning Outcomes?

The short answer is to complete one of the following statements:

- At the end of this course, **students** should be able to
- On successful completion of this course, **students** will be able to

By using such a stem, *the focus is turned to the student and what they will be able to do.*

What is yours ...

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- What is your Programme Goals or Aims?
(a broad general statement of teaching intention)
- What is your Programme Objectives?
(a specific statement of teaching intention)

Group discussion: min

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Easy Syntax..... ELO Statement

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Syntax

- (a) Action verb (Educational Taxonomy)
+ Objects + Modification (T&L/Assessment)

Graduates of our program shall have:

- (a) an ability to **design + a system, component, or process + to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability**

CVL20085



SMART

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SMART helps to check an LO that required characteristics:

- **Specific:** accurately states what the successful student is expected to achieve
- **Measurable:** open to assessment which accurately assesses whether or not the outcome has been achieved
- **Achievable:** should be within the range of abilities of the student
- **Relevant:** should be relatable to the key aims of the programme
- **Time scaled:** must be achievable within the duration of the study-unit/programme

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Recommended Verbs for Writing Learning Outcomes

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COGNITIVE (K)

REMEMBER	UNDERSTAND	APPLY	ANALYZE	EVALUATE	CREATE
Retrieve knowledge from long-term memory	Construct meaning from instructional messages, including oral, written, graphic communication	Carry out/use procedure in a given situation	Break material into constituent parts; determine how parts relate to one another and to an overall structure or purpose	Make judgments based on criteria and standards	Put elements together to form coherent or functional whole; reorganize elements into a new pattern or structure
Sample Verbs:	Sample Verbs:	Sample Verbs:	Sample Verbs:	Sample Verbs:	Sample Verbs:
<ul style="list-style-type: none"> • Define • Describe • Label • List • Match • Recall • Recognize • State 	<ul style="list-style-type: none"> • Classify • Compare • Discuss • Exemplify • Explain • Identify • Illustrate • Infer • Interpret • Predict • Report • Review • Summarize • Translate 	<ul style="list-style-type: none"> • Apply • Change • Choose • Demonstrate • Execute • Implement • Prepare • Solve • Use 	<ul style="list-style-type: none"> • Analyze • Attribute • Debate • Differentiate • Distinguish • Examine • Organize • Research 	<ul style="list-style-type: none"> • Appraise • Check • Critique • Judge 	<ul style="list-style-type: none"> • Compose • Construct • Create • Design • Develop • Formulate • Generate • Invent • Make • Organize • Plan • Produce • Propose

(Adapted from BCIT (2003) and PATE Module on Assessment and Evaluation)

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PSYCHOMOTOR (S)

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PERCEIVE	SET	RESPOND AS GUIDED	ACT	RESPOND OVERTLY	ADAPT	ORGANIZE
Senses cues that guide motor activity	Is mentally, emotionally, physically ready to act	Imitates and practices skills	Performs acts with increasing efficiency, confidence, ad proficiency	Performs acts automatically	Adapts skill sets to solve a problem	Creates new patterns for specific situations
Sample Verbs:	Sample Verbs:	Sample Verbs:	Sample Verbs:	Sample Verbs:	Sample Verbs:	Sample Verbs:
<ul style="list-style-type: none"> Detect Differentiate Distinguish Identify Observe Recognize Relate Describe the perception Describe the sensation: <ul style="list-style-type: none"> Hear Listen See Smell Taste 	<ul style="list-style-type: none"> Assume a stance Display Perform motor skills Position the body Proceed Show 	<ul style="list-style-type: none"> Copy Duplicate Imitate Operate under supervision Practice Repeat Reproduce 	<ul style="list-style-type: none"> Assemble Calibrate Complete with confidence Conduct Construct Demonstrate Dismantle Fix Execute Improve efficiency Make Manipulate Measure Mend Organize Produce 	<ul style="list-style-type: none"> Act habitually Control Direct Guide Manage Perform <p><i>Note: Same verbs as "ACT", but with modifiers describing the performance, e.g., faster, better, more accurate, outstanding, etc.</i></p>	<ul style="list-style-type: none"> Adapt Alter Change Rearrange Reorganize Revises 	<ul style="list-style-type: none"> Arrange Build Compose Construct Create Design Originate Make

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AFFECTIVE (A)

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RECEIVE	RESPOND	VALUE	ORGANIZE	INTERNALIZE (CHARACTERIZE)
Selectively responds to stimuli	Responds to stimuli	Attaches value or worth to something	Conceptualizes value and resolves conflict between this value and other values	Integrate the value into a value system that controls behavior
Sample Verbs:	Sample Verbs:	Sample Verbs:	Sample Verbs:	Sample Verbs:
<ul style="list-style-type: none"> Acknowledge Choose Demonstrate awareness Demonstrate tolerance Locate Select 	<ul style="list-style-type: none"> Answer Communicate Comply Contribute Cooperate Discuss Participate willingly Volunteer 	<ul style="list-style-type: none"> Adopt Assume responsibility Behave according to Choose Commit Express Initiate Justify Propose Show concern Use resources to 	<ul style="list-style-type: none"> Adapt Adjust Arrange Balance Classify Conceptualize Formulate Organize Prepare Rank Theorize 	<ul style="list-style-type: none"> Act upon Advocate Defend Exemplify Influence Perform Practice Serve Support

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Examples of Remembering/Understanding

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- Recall genetics terminology: homozygous, heterozygous, phenotype, genotype, etc.
- Identify and consider ethical implications of scientific investigations.
- List the criteria to be taken into account when caring for a patient with tuberculosis.
- Differentiate between civil and criminal law.
- Identify participants and goals in the development of electronic commerce.
- Predict the genotype of cells that undergo meiosis and mitosis.
- Classify reactions as exothermic and endothermic.

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Examples of Applying/Analyzing

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- Apply knowledge of infection control in the maintenance of patient care facilities.
- Relate energy changes to bond breaking and formation.
- Modify guidelines in a case study of a small manufacturing firm to enable tighter quality control of production.
- Analyse why society criminalises certain behaviours.
- Compare and contrast the different electronic business models.
- Debate the economic and environmental effects of energy conversion processes.

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Examples of Evaluating/Creating

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- Recognise and formulate problems that are amenable to energy management solutions.
- Propose solutions to complex energy management problems both verbally and in writing.
- Relate the sign of enthalpy changes to exothermic and endothermic reactions.
- Organise a patient radiation protection procedure.
- Predict the effect of change of temperature on the position of equilibrium.

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AUN 1: Expected Learning Outcomes (3)

74

1	Expected Learning Outcomes
1.1	The expected learning outcomes have been clearly formulated and aligned with the vision and mission of the university. [1,2]
1.2	The expected learning outcomes cover both subject specific and generic (i.e. transferable) learning outcomes. [3]
1.3	The expected learning outcomes clearly reflect the requirements of the stakeholders. [4]

OLV20085



Criterion 1 Expected Learning Outcomes

75

1.	The formulation of the expected learning outcomes takes into account and reflects the vision and mission of the institution. The vision and mission are explicit and known to staff and students.
2.	The programme shows the expected learning outcomes of the graduate. Each course and lesson should be designed to achieve its expected learning outcomes.
3.	The programme shows the expected learning outcomes of the graduate. Each course and lesson should be designed to achieve its expected learning outcomes. (To meet Requirements Content)
4.	The programme has clearly formulated the expected learning outcomes which reflect the relevant demands and needs of the stakeholders.

1	Expected Learning Outcomes	1	2	3	4	5	6	7
1.1	The expected learning outcomes have been clearly formulated and aligned with the vision and mission of the institution. The vision and mission are explicit and known to staff and students.							
1.2	The programme shows the expected learning outcomes of the graduate. Each course and lesson should be designed to achieve its expected learning outcomes [3]. (To write Checklist Context)							
1.3	The expected learning outcomes clearly reflect the requirements of the stakeholders [4].							
Overall opinion								

Diagnostic Questions

- What is the vision and mission of the institution?
- What are the expected learning outcomes of the graduate?
- How do the expected learning outcomes reflect the vision and mission of the university, faculty or department?

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1. Expected Learning Outcomes

76

Requirements (4)

1. The formulation of the expected learning outcomes takes into account and reflects the vision and mission of the institution. The vision and mission are explicit and known to staff and students.
2. The programme shows the expected learning outcomes of the graduate. Each course and lesson should clearly be designed to achieve its expected learning outcomes which should be aligned to the programme expected learning outcomes.

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1. Expected Learning Outcomes

77

Requirements (4)

- 3. The programme is designed to cover both subject specific outcomes that relate to the knowledge and skills of the subject discipline; and generic (sometimes called transferable skills) outcomes that relate to any and all disciplines e.g. written and oral communication, problem-solving, information technology, teambuilding skills, etc.
- 4. The programme has clearly formulated the expected learning outcomes which reflect the relevant demands and needs of the stakeholders.

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Easy Syntax..... ELO Statement

78

Graduates of our program shall have:

- (c) an ability to **design + a system, component, or process + to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability**

Syntax

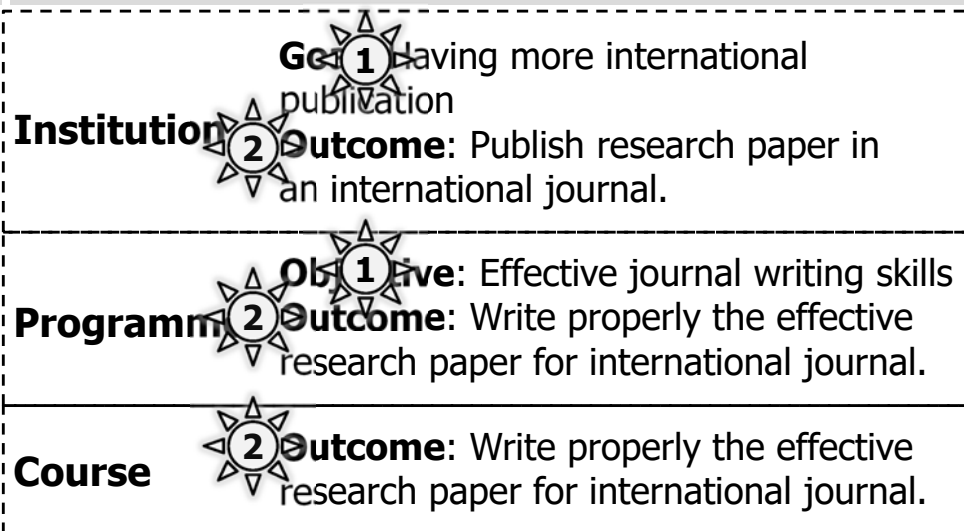
- (c) **Action verb** (Educational Taxonomy)
+ Objects + Modification (T&L/Assessment)

CUV20085



EX.: Goals (Objs) and Learning Outcomes

79



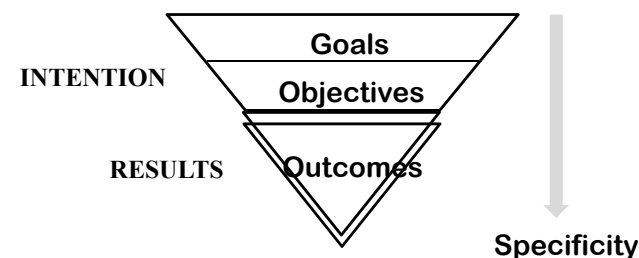
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What is your ... ALIGNMENT

80

- What is your Programme Aims?
(a broad general statement of teaching intention)
- What is your Programme Objectives?
(a specific statement of teaching intention)



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Example

81

- **Programme aims** to produce graduates who possess in-depth knowledge and skills for scientific decision making, and are able to construct models and analyse the problems accordingly. The possessed knowledge and skill should also be integrated in the other field areas such as economy, accounting and management.

MLV20085



Programme Learning Outcomes

82

LOD 1	Apply knowledge of mathematics, probability, statistics, operational research/decision science and operation management, as well as information and communication technology (ICT).
LOD 2	Design, model and solve real world and hypothetical problems, and thus able to analyse and interpret data using contemporary computer tools.
LOD 3	Use quantitative techniques, modelling skills and contemporary decision science tools for industries, public institution and society.
LOD 4	Communicate effectively orally, graphically and in writing, and function in culturally diverse, gender-diverse and multi-disciplinary teams.
LOD 5	Integrate and synthesize organisational issues, and evaluate potential solutions in the broader context of the organisation or society.
LOD 6	Participate in lifelong learning, career advancement activities, and keep up-to-date with knowledge of emerging technologies.
LOD 7	Commercialise tangible and intangible decision making products, in the form of written, oral and electronic media.
LOD 8	Carry out professional and ethical responsibility.
LOD 9	Portray leadership and accountability, and exercising management and decision making skills.

MLV20085



Business Administration Learning Outcomes

<https://www.une.edu/cas/business/programs/business-administration/learningoutcomes>

83

- **Demonstrate foundational knowledge** in accounting, economics, finance, management, and marketing in application of concepts and theories.
- **Demonstrate effective skills** in written and oral communications using appropriate technologies.
- **Demonstrate an ability to integrate** the concepts of the core areas of business.
- **Demonstrate awareness** to the importance of the ethical requirements of business activities.
- **Demonstrate an ability to conduct** methodological, secondary research into business issues, which may relate to general business or to a specific business function, which requires familiarity with a range of data, research sources and appropriate methodologies.

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Civil Engineering, B.S.

1/3

<http://www.csun.edu/engineering-computer-science/civil-engineering-construction-management/ce-program-mission>

84

Program Mission

- To provide our students with a sound basic civil engineering education and to prepare them for entry into the professional practice of civil engineering, as well as to inculcate in them a recognition that civil engineering is a people serving profession. In keeping with these goals, we aim to develop in them an understanding that a successful professional career is one that addresses the needs of society and requires a lifetime of learning and leadership.

Program Educational Objectives

- To carry out the mission of the civil engineering program, the faculty have established the following educational objectives. During the first few years (1-5) following graduation, the graduates of the Civil Engineering program will have the following qualities:
- Graduates will accept increasing levels of responsibility over time and obtain their desired professional registration.
- Graduates will continue further studies in engineering and other professional disciplines as appropriate to their careers.
- Graduates will develop creative engineering solutions to project challenges that are cost effective and environmentally sensitive.

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Student Outcomes

2/3

Graduates of our program shall have:

- 85
- (a) an ability to apply knowledge of mathematics, science, and engineering;
 - (b) an ability to conduct laboratory experiments and to critically analyze and interpret data in more than one of the recognized major civil engineering areas;
 - (c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability;
 - (d) an ability to function on multidisciplinary teams;
 - (e) an ability to identify, formulate, and solve engineering problems;
 - (f) an understanding of professional and ethical responsibilities;
 - (g) an ability to communicate effectively;
 - (h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context;

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Student Outcomes

3/3

- 86
- (i) a recognition of the need for, and an ability to engage in life-long learning;
 - (j) a knowledge of contemporary issues;
 - (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice;
 - (l) apply knowledge in a minimum of four (4) recognized major civil engineering areas;
 - (m) an ability to perform civil engineering design by means of design experiences integrated throughout the professional component of the curriculum; and
 - (n) an understanding of professional practice issues such as: procurement of work; bidding versus quality based selection processes; how the design professionals and the construction professions interact to construct a project; the importance of professional licensure and continuing education; and/or other professional practice issues.

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MPA: <http://www.depaul.edu/university-catalog/degree-requirements/graduate/class/public-administration-mpa/Pages/learning-outcomes.aspx>

87

- **Clearly explain to stakeholders** key public issues both orally and in writing and detail their impact on the public at large.
- **Distinguish the interactive roles** that government organizations play in the business and non-profit sectors in planning and delivering public services.
- **Develop a research** question regarding a governmental issue, collect relevant data, and resolve the question.
- **Apply leadership** theories and techniques in managing and governing a public organization.
- **Use an ethical framework** to analyze an ethical dilemma within the political context of a government institution.

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Communication and Information Sciences Ph.D. Program

88

- (SLO1) Demonstrate understanding of research methods and subject knowledge in the field of Communication and Information Sciences
- (SLO2) Synthesize diverse data, theories, and methods
- (SLO3) Demonstrate the ability to conduct research
- (SLO4) Propose and conduct original research
- (SLO5) Develop and articulate a professional identity as a contributing member of a research community

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Ph.D. – Economic Programme

89

- SLO1. Demonstrate an ability to apply the economic theory and analytical and quantitative tools.
- SLO2. Demonstrate an ability to integrate, and apply the various tools, concepts, and principles of economics and quantitative methods to analyze and to develop solutions to economic problems in a clear and concise written form.
- SLO3. Demonstrate a "frontier" level competency and familiarity with the literature in the student's perceived specialty area.
- SLO4. Demonstrate the ability to conduct independent and original research in economics.
- SLO5. Have the skills necessary to qualify for teaching positions at the university and college levels, and for research positions in the public or private sector.

Example

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90

Exercise 1: Formulation of Expected Learning Outcomes (ELOs)

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Step to formulate ELOs

91

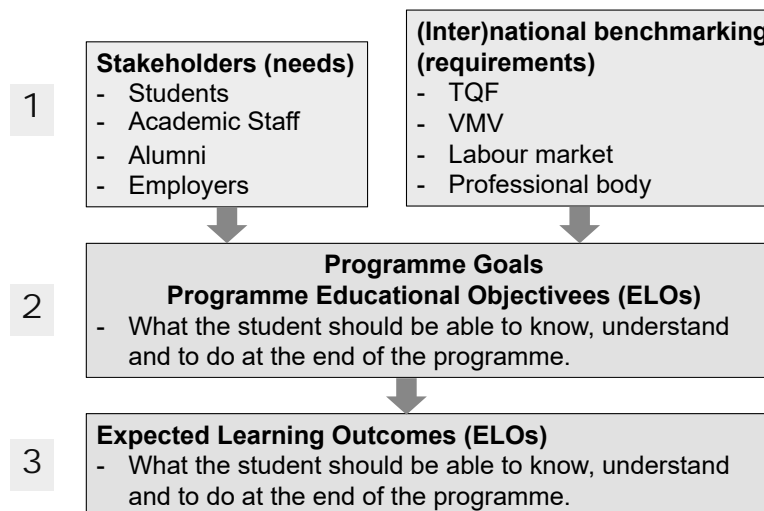
- (1) Find out (survey, feedback, seminar,...)→ What are
 - the requirements of accreditation body, benchmarked institution, labour market, NQF and/or professional body?
 - the requirements of students, academic staff, alumni and employers?
 - the Vision, Mission, Values and Graduate attributes of MU, faculty and/or department?
- (2) Translate all information of (1) to formulate your Programme Goals (Aims) and/or Programme Educational Objectives.
- (3) Formulate Expected Learning Outcomes (ELOs) of your programme

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Step to formulate ELOs

92



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Exercise 1: Formulate Programme ELOs

93

1) Formulate Programme Goals (Aims) and Programme Objectives)

Discuss in your group.

2) Formulate Expected Learning Outcomes (ELOs) of your programme. Then review:

- How each ELO statement looks SMART?
- How each ELO statement aligns with VMV-MU/FAC?
- How each ELO statement aligns with Programme Goals (Aims) and Programme Objectives?

Discuss in your group. 

Time is Yours: ...45.. min

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ELOs – After finished please review...

94

ELOs	VMV	PG/PEO	SMART				
			S	M	A	R	T
ELO1	What?		✓	✓	✓	✓	✓
ELO2		What?	✓	✓	✓	✓	✓
ELO3			✓	✓	✓	✓	✓
ELO4			✓	✓	✓	✓	✓
ELO5			✓	✓	✓	✓	✓
ELO6			✓	✓	✓	✓	✓

S = Specific, **M** = Measurable, **A** = Achievable, **R** = Relevant, **T** = Time scale

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Alignment of Stakeholders' Requirements with ELOs

95

No	ELO	NQF	student	Academic staff	Alumni	Employer
1		What?				
2			What?			
3				What?		
4					What?	
5						What?
6						
7						
8						

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Classification of ELOs

96

ELOs	K	Skills		C	AUN-QA	
		Hard	Soft		Specific	Generic
ELO1						
ELO2						
ELO3						
ELO4						
ELO5						
ELO6						

K = Knowledge,

S = Skill,

A = Application and responsibility

(Competence, Application of knowledge and skills)

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Align Teaching & Learning and Assessment Schemes with ELOs (Constructive Alignment)

97

No	ELO	T&L Approach	Assessment Scheme
1		Depending on the level of taxonomy stated	Depending on the level of taxonomy stated
2			
3			
4		How to teach?	
5			How to assess?
6			
7			

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Example

98

ELO according to Bloom	Teaching method	Assessment and Evaluation method	Study Method
Knowledge Remembering	Giving lectures	Oral test, written test, MCQ	Attending lectures and Independent Study
Understanding / Applying	Brain storming and pair work	Class Test, Project-based assignment, Seminar	Independent Study, Practice
Analyzing/Evaluating	Cooperative Learning Problem-based Teaching	Project Assignment Conduction Plan	Practice, Report Preparation
Creating	Teaching through Project Conduction, Situation Examination, Simulation or Conduction with the public attendance	Project-based Assignment	Practice, Report Writing

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5 Basic steps in a curriculum design based on OBE

1. Clearly defining the Expected Learning Outcomes
2. Backward Curriculum designed to align with ELOs
3. Construct Program Structure and Content that the sequence and integration are achieved.
4. Construct appropriate Course Syllabus that the alignment of CLOs with ELOs and constructive alignment of each course are achieved.
5. Review Program Constructive Alignment to ensure the ELOs can be achieved

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100

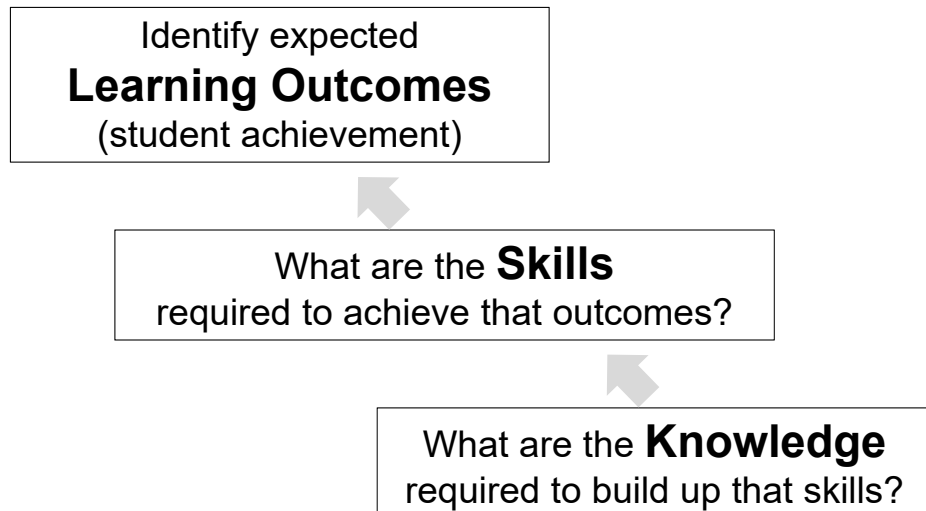
From ELOs
↓
Design the Curriculum
Using
Backward Curriculum Design

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Backward Design Process

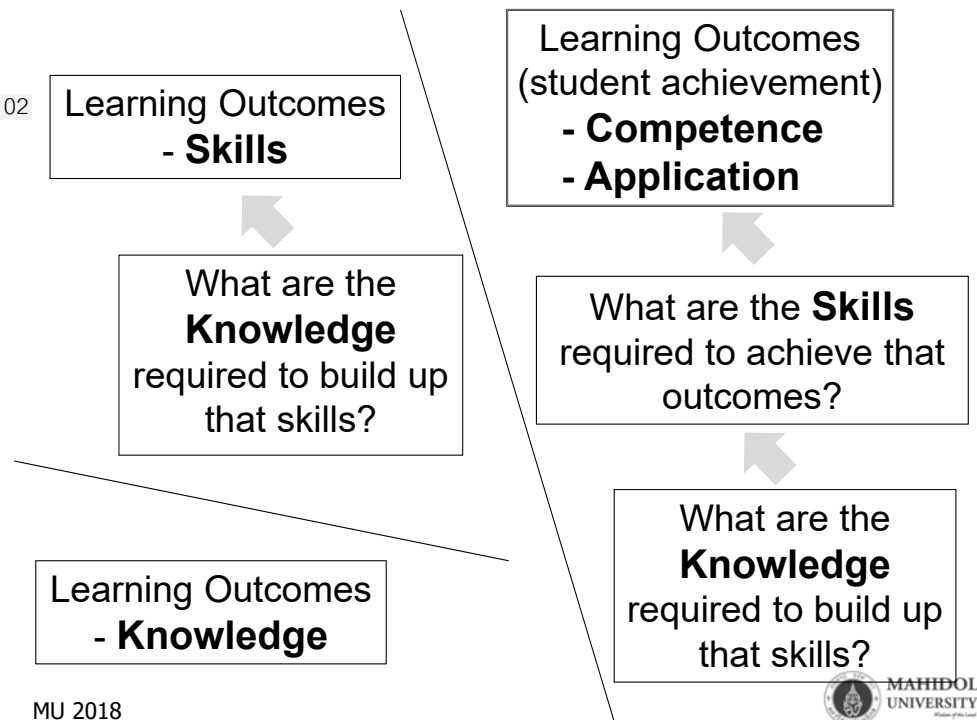
101



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(2) Backward Design Curriculum, BDC

103

ELO/ Competency	Specific Skills	Generic Skills	Knowledge
ELO 1	SS1	GS1 GS2	K1 K2 K3
	SS2	GS1	K2 K4
	SS3	GS1 GS3	K1 K2 K5
ELO 2	SS3	GS3 GS4	K1 K2 K3

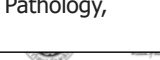
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ELO4: Perform imaging of CT-brain in emergency

104

Specific Skills	Soft-Skills (Transferable skills)	Knowledge
1. Patient approach	Communication, Cultural awareness, Professional ethics	Declaration of Patient's rights, Request, patient information
2. Patient preparation and positioning	Communication, Cultural awareness, Professional ethics	CT technology, Anatomy
3. Handing of CT and instrumentation concerned	Decision making, Problem solving	CT technology, CT-Physics, PACS,
4. Exposure techniques	Decision making, Professional ethics	CT technology, CT-Physics, Anatomy
5. Radiation protection	Decision making, Problem solving	CT technology, CT-Physics, Biological effect, Anatomy
6. Quality control		CT technology, QC instrument
7. Image interpretation		CT technology, Image quality, Cross-sectional anatomy, Radiation pathology
8. Patient care	Communication, Problem solving, Professional ethics	HPC, CPR
9. Clinical correlation	Working with the other	Clinical Labs, Pathology, Diseases



ELO4: Perform imaging of CT-brain in emergency

105

Specific Skills	Soft-Skills (Transferable skills)	Knowledge
1. Patient approach	Communication Cultural awareness Professional ethics	Patient information Declaration of Patient's rights Request
2. Patient preparation and positioning	Communication Cultural awareness Professional ethics	Anatomy CT technology
3. Handing of CT and instrumentation concerned	Decision making Problem solving	PACS CT technology CT- Physics
4. Exposure techniques	Decision making Professional ethics	Anatomy CT technology CT- Physics

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ELO4: Perform imaging of CT-brain in emergency

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Semester 1	Semester 2	Semester 3	Semester 4	Semester 5	Semester 6	Semester 7	Semester 8
GE							
				Communication 5 Professional ethics 5 Problem solving 5 Cultural awareness 4 Decision making 4	Anatomy 5 CT- Physics 4 CT technology 2 PACS 2	Request 1 Declaration of Patient's rights 1 Patient information 1	

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Combine into a subject/course

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PLO/ Competency	Specific Skills	Subjects concerned	Soft-Skills	Subjects concerned	Knowledge	Subjects concerned
Perform imaging of CT-brain in emergency	1. Patient approach		Communication, Cultural awareness, Professional ethics		Declaration of Patient's rights, Request, patient information	
	2. Patient preparation and positioning		Communication, Cultural awareness, Professional ethics		CT technology, Anatomy	
	3. Handing of CT and instrumentation concerned		Decision making, Problem solving		CT technology, CT-Physics, PACS,	
	4. Exposure techniques		Decision making, Professional ethics		CT technology, CT-Physics, Anatomy	
	5. Radiation protection		Decision making, Problem solving		CT technology, CT-Physics, Biological effect, Anatomy	
	6. Quality control				CT technology, QC instrument	
	7. Image interpretation				CT technology, Image quality, Cross-sectional anatomy, Radiation pathology	
	8. Patient care		Communication, Problem solving, Professional ethics		HPC, CPR	
	9. Clinical correlation		Working with the other		Clinical Labs, Pathology, Diseases	



ELO 3: Develop, adapt and implement research methodologies to extend and redefine existing knowledge and/or professional practice

108

Specific skill required	Generic skill required	Knowledge required
SS1 Develop research question	GS1 IT skill GS2 Reading skill (English proficiency)	K1 Research methodology K2 Literature review K3 Professional knowledge
SS2 Research plan	GS3 Decision making	K1 Research methodology
SS3		
THESIS		

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ELO 3: Develop, adapt and implement research methodologies to extend and redefine existing knowledge and/or professional practice

109

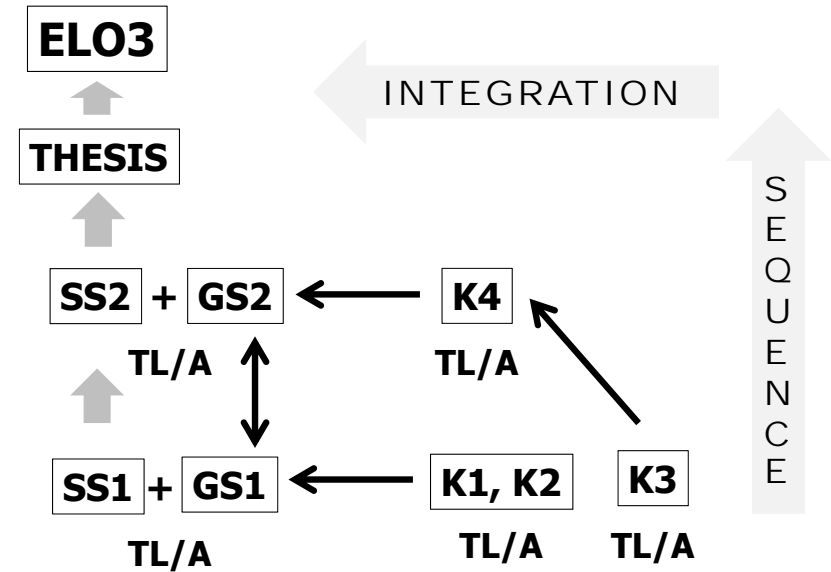
Specific skill required	Generic skill required	TL	A	Knowledge required	TL	A
SS1 Develop research question	GS1 IT skill GS2 Reading skill (English proficiency)			K1 Research methodology K2 Literature review K3 Professional knowledge		
SS2 Research plan	GS3 Decision making			K1 Research methodology		
SS3						
THESIS						

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BDC: Approach of T&L

110



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Transform BCD to Courses, Modules, Activities

111

From **BCD** of all ELOs, you can combine KNOWLEDGES and SKILLS to COURSES

For **example: From ELO3,**

Course C1 = K1 + K2 + K3

Course C2 = SS1 + GS1

Course C3 = K4 + SS2 + GS2

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From the backward curriculum design ...

112

You can combine the related Knowledge, Skill, and Competence into

- Courses (subjects),
- Units,
- Modules, or
- Activities
- Sequencing the courses, units, modules and activities to make a study plan

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BS – Conservation Biology

113

ELO-ป4๙	Skills๙		Knowledge๙
	specific๙	generic๙	
Use-the-processes-and-methods-of-scientific-inquiry,computer-literacy,numerical-and-statistical-skills-related-to-biodiversity-conservation๙	Demonstrate-scientific-inquiry,computer-literacy,numerical-and-statistical-skills-related-to-biodiversity-conservation๙	(G1)-Scientific-inquiry๙ (G2)-Information-management๙ (G4)-Numerical-and-statistical-skills๙	(K8)-Population-biology๙ (K10)-Ecology๙ (K12)-Conservation-biology๙ (K13)-Environmental-science๙ (K16)-Geographic-information-system๙ (K19)-Research-methodology๙ (K26)-Statistical-analysis๙ (K27)-Information-management-and-computer-application๙
	Solve-problems-by-using-the-scientific-inquiry,computer-literacy,numerical-and-statistical-skills๙	(G1)-Scientific-inquiry๙ (G2)-Information-management๙ (G4)-Numerical-and-statistical-skills๙ (G5)-Decision-making๙ (G6)-Communication-skills๙ (G9)-Critical-thinking๙ (G10)-Holistic-view๙ (G11)-Problem-solving๙	(K8)-Population-biology๙ (K10)-Ecology๙ (K12)-Conservation-biology๙ (K13)-Environmental-science๙ (K16)-Geographic-information-system๙ (K19)-Research-methodology๙ (K26)-Statistical-analysis๙ (K27)-Information-management-and-computer-application๙

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Exercise 2: Curriculum Design Using Backward design Technique

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Backward curriculum design

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Procedures:

1. From each ELO/Competence, determine the specific and/or generic skills need to achieve that ELO.
2. From each specific and/or generic skills, determine the knowledge need to achieve that particular skill.
3. Transform BCD to Courses and Activities

Time is yours: ...90... min

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5 Basic steps in a curriculum design based on OBE

- 1 Clearly defining the Expected Learning Outcomes
- 2 Backward Curriculum designed to align with ELOs
- 3 Construct Program Structure and Content that the sequence and integration are achieved.
- 4 Construct appropriate Course Syllabus that the alignment of CLOs with ELOs and constructive alignment of each course are achieved.
- 5 Review Program Constructive Alignment to ensure the ELOs can be achieved

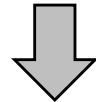
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From ELOs and BCD



Construct the Program Structure and Contents



Construct the Curriculum Map



AUN 3: Programme Structure and Content (3)

3	Programme Structure and Content
3.1	The curriculum is designed based on constructive alignment with the expected learning outcomes. [1]
3.2	The contribution made by each course to achieve the expected learning outcomes is clear. [2]
3.3	The curriculum is logically structured, sequenced, integrated and up-to-date. [3,4,5,6]

3. Programme Structure and Content

Requirements (6)

1. The curriculum, teaching and learning methods and student assessment are constructively aligned to achieve the expected learning outcomes.
2. The curriculum is designed to meet the expected learning outcomes where the contribution made by each course in achieving the programme's expected learning outcomes is clear.
3. The curriculum is designed so that the subject matter is logically structured, sequenced, and integrated.

3. Programme Structure and Content

Requirements (6)

4. The curriculum structure shows clearly the relationship and progression of basic courses, the intermediate courses, and the specialised courses.
5. The curriculum is structured so that it is flexible enough to allow students to pursue an area of specialisation and incorporate more recent changes and developments in the field.
6. The curriculum is reviewed periodically to ensure that it remains relevant and up-to-date

Curriculum in OBE Framework

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The **curriculum should be designed** so that

- the teaching activities, learning activities and assessment tasks are co-ordinated with the expected learning outcomes (**Constructive Alignment at Programme Level**), and
- the curriculum is logically **structured, sequenced and integrated**.

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QA at Programme Level

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Programme structure

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GE	Entrance Assessment
Core Courses	Qualifying Program
Specialise Courses	Core Courses
Electives	Thesis, Thematic Paper, Dissertation
Senior project	Internship, Fieldwork, Electives
Internship	Exit Assessment
Exit Assessment	

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Programme structure of DVM

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Curriculum Structure of BSP

124

STRENGTHENING THE UNDERSTANDING & PRACTICAL OF RESEARCH BY USING INTERDISCIPLINARY APPROACHES (Related to Biological Conservation and Bioengineering)				Applying research methodology & scientific writing	Work as biological in the laboratory and field area	Sem 7-8
Application of competencies in internship as consultant, researcher and entrepreneur		Developing bio-entrepreneurship spirit, and capability in communicating both in Indonesian language and English				Sem 5-6
COORDINATION, REGULATION, GROWTH, DEVELOPMENT AND THEIR ANALYSIS						
Coordination & communication in the biosystematics	Growth & development	Problem analyzing & solving in the biosystematics	Biosystematics modelling	Applying research methodology & scientific writing	Work as biological in the laboratory and field area	Sem 2-4
STRUCTURE & FUNCTION IN LIVING CREATURE ORGANIZATION						
Biodiversity From border life to macroorganism	Structure of living creature organization: From molecule, cell, tissue, organ, individual, population, community to		Interaction between structure & function in micro-macroorganism	Applying research methodology & scientific writing	Work as biological in the laboratory and field area	Sem 1
BASIC SCIENCES SUPPORTING THE MODERN BIOLOGY & SUCCESS LIFE SKILLS						
Basic sciences that supports the role understanding and contribution of Biology in the future			Success skills guidance (to be outstanding learner in UB & in the society)			

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Concentration	Public Policy	Public Service	Developmental	Governmental
Generic & Specialized Knowledge and Skill	Religion, Pancasila, Citizenship Education, Indonesian Language, English Language, Introduction to Public Administration Science, Organizational Theory, Administration Analysis, Law of Public Administration, History of Administrative Science Thinking, Indonesian Social Cultural System, Management Principles, Ethics in Public Administration, Organizational Communication, Organizational Behavior & Development, Statistic, Public Administration Theory, Research Method, Entrepreneurship, Performance in Public Sector Organization, Bureaucracy, Strategic Management for Public Sector, Leadership, Methods of Scientific Writing, Governance Theory, Global Governance, Qualitative & Quantitative Data Analysis, Development of Capacity and Institutional of Public Sector, Public Finance Management, Comparative of Public Administration, Human Resource Management for Public Sector, Administrative Reform, Ecology of Administration, Empowerment of Local Community and Resource, Internship			
	Public Policy I, Public Policy II, Indonesian Political System, Decision Making, Fiscal & Financial Policy	Public Service Management, Public Management Theory, Information System Management of Public Sector	Theory of Development, Administration of Development, Developmental Planning, Political Economy of Development, Urban Developmental Policy	Indonesian Public Administration System, Local Governmental System
Concentration course	Seminar of Public Policy Issues	Seminar of Public Service Issues	Seminar of Developmental Issues	Seminar of Governmental Issues
Final Project	Thesis	Thesis	Thesis	Thesis

Example



Programme Structure

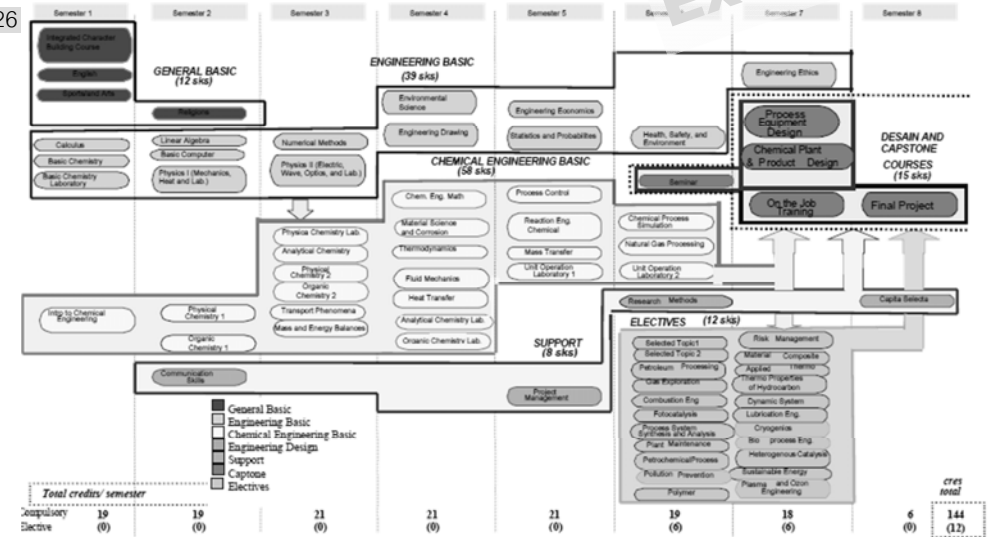
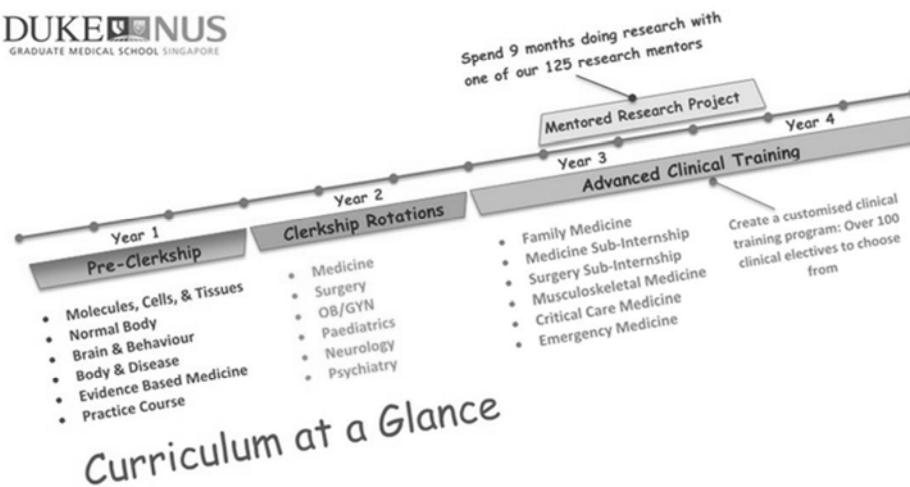


Figure 2.2 Curriculum Structure of ChESP

Source: Chemical Engineering, Universitas Indonesia



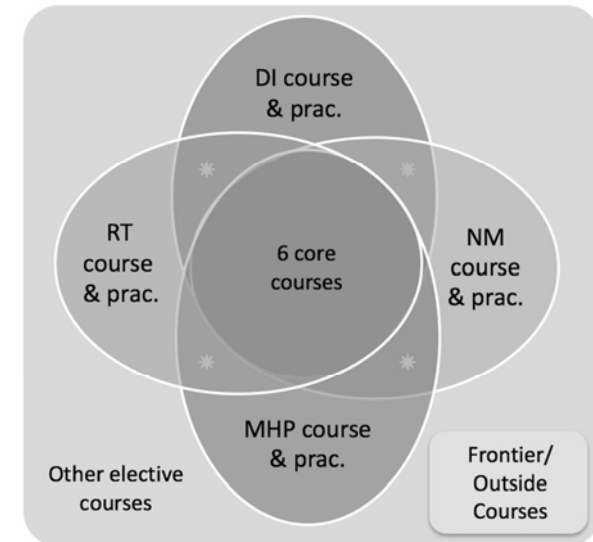
MD Programme



Curriculum at a Glance



Medical Physics Program Curriculum



* 1 minor track courses for PhD (optional for MS)

<https://medicalphysics.duke.edu/programs>



Curriculum matrix, example 1

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Table 1.2 Relationship between Courses and Expected Learning Outcomes (Continued)

No	Code	Course	Credit	Expected Learning Outcome (ELO)							
				ELO 1	ELO 2	ELO 3	ELO 4	ELO 5	ELO 6	ELO 7	
27	CHS220802	Analytical Chemistry Lab.	1	5	5	1	1	1	5	1	
28	CHS210801	Mass and Energy Balance	3	5	1	1	1	1	5	1	
29	CHS210802	Transport Phenomena	3	5	1	3	5	1	5	1	
30	CHS220804	Fluid Mechanics	3	5	1	1	5	1	5	1	
31	CHS220805	Material Construction and Corrosion	3	5	1	1	1	4	3	3	
32	CHS220806	Thermodynamics	3	5	1	1	1	5	5	5	
33	CHS220807	Heat Transfer	3	5	1	1	1	5	5	5	
34	CHS220801	Chemical Engineering Mathematics	3	5	1	5	1	5	1	1	
35	CHS310802	Mass Transfer	4	5	1	2	5	1	5	1	
36	CHS310803	Unit Operation Lab 1	2	5	5	1	5	1	5	1	
37	CHS320803	Unit Operation Lab 2	2	5	5	1	5	1	5	1	
38	CHS310804	Chemical Reaction Engineering	4	5	1	1	1	5	5	5	
39	CHS310806	Process Control	3	5	1	5	1	1	5	1	
40	CHS320801	Chemical Process Simulation	3	5	1	5	5	1	5	1	
41	CHS320802c	Natural Gas Processing	3	5	1	4	5	1	5	5	
42	CHS120801	Communication Skill	2	Note: The figures in the ELO column relate to:							5
43	CHS310805	Project Management	2	1 Not directly related to ELO							5
44	CHS320804	Research Methods	2	2 Quite related to ELO							1
45	CHS400803	Capita Selecta	2	3 Related to ELO							5
46	CHS410801	Process Equipment Design	4	4 Closely related to ELO							5
47	CHS410802	Chemical Plant and Product Design	4	5 Specifically related to ELO							5
48	CHS300805	Seminar	1	5							5
49	CHS400801	On the Job Training	2	5							5
50	CHS400802	Final Project	4	5							5
51	CHF410801c	Composite Material	3	4	1	1	1	4	5	4	
52	CHF410802	Applied Thermodynamics	3	5	1	3	1	1	4	4	
53	CHF410803	Dynamic Systems	3	4	1	3	1	3	4	4	

Source: Chemical Engineering, Universitas Indonesia

QA at Programme Level

Curriculum map with educational taxonomy

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	COURSE	CR	LO1	LO2	LO3	LO4	LO5
Basic courses							
1	Subject 1	3	R			A	
2	Subject 2	3	R		A		
Intermediate courses							
3	Subject 3	3	R	A		A	
4	Subject 4	3	R			A	
Specialized courses							
5	Subject 5	3		A	A	E	E
6	Thesis	18		A	A	E	E

Bloom's Taxonomy R = Remembering / Understanding
 A = Applying / Analyzing
 E = Evaluating / Creating

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Curriculum Map: Course matrix

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COURSES	ELO1	ELO2	ELO3	ELO4	ELO5
Core Courses					
MU 510			K1,K2,K3		
MU 520			SS1-GS1		
Specialize Courses					
MU 610					
MU 640					
MU 690			K4, SS2-GS2 A		
Fieldwork		SS1-9 / A		GS1-4 / A	
Thesis		SS1-9 / A		GS1-4 / A	

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(3) Curriculum Map

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COURSES	LO1(K/S)	LO2(S/C)	LO3(RC)	LO4(GS)	LO5(GS)
MU 101	I	I	I	I	I
MU 102	I	I	I	I	I
MU 120	I	E	E	E	E
MU 121	E	E	E	E	E
MU 253		E	E	E	E
MU 241	E/A	M	M	M	M
MU 295	M/A	M/A	M/A	M/A	M/A
MU 296	A	A	A		

I = introduced; E = emphasized; M = mastered;
 A = ELO assessed

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(3) Curriculum Map

3 SLOs 2 GLOs

SEQUENCE	COURSES	3 SLOs			2 GLOs	
		LO1(K/S)	LO2(S/C)	LO3(RC)	LO4(GS)	LO5(GS)
	MU 101	I	I	I	I	I
	MU 102	I	I	I	I	I
	MU 120	I	E	E	E	E
	MU 121	E	E	E	E	E
	MU 253		E	E	E	E
	MU 241	E/A	M	M	M	M
	MU 295	M/A	M/A	M/A	M/A	M/A
	MU 296	A	A	A		

I = introduced; E = emphasized; M = mastered;
A = ELO assessed

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(3) Curriculum Map

3 SLOs 2 GLOs

SEQUENCE	COURSES	3 SLOs			2 GLOs	
		LO1(K/S)	LO2(S/C)	LO3(RC)	LO4(GS)	LO5(GS)
	MU 101	I	I	I	I	I
	MU 102	I	I	I	I	I
	MU 120	I	E	E	E	E
	MU 121	E	E	E	E	E
	MU 253		E	E	E	E
	MU 241	E/A	M	M	M	M
	MU 295	M/A	M/A	M/A	M/A	M/A
	MU 296	A	A	A		

I = introduced; E = emphasized; M = mastered;
A = ELO assessed

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Ph.D. – Economic Programme

PhD Program Requirements	ELO1	ELO2	ELO3	ELO4	ELO5	ELO6	ELO7
Core Courses	I, R	I	I	I	I		
Qualifying Exams	R	R					I, A
Field Courses	R	R	I, R	I, R	I, R	I, R	
Research Seminar	R	R	R	I, R	R	R	R, A
Electives	R	R	R	R	R	R	
Proposal Defense	R, A	R, A	R, A	R, A	R	R	R
Thesis Defense	M, A	M, A	M, A	M, A	M	M	R
Thesis Submission	M	M	M	M	M	M	A

I = Introduced; R = Reinforced & opportunity to practice; M = Mastery at the senior or exit level;
A = Assessment evidence collected

1. Demonstrate an understanding of economic theory and analytical and quantitative tools.
2. Demonstrate an ability to understand, integrate, and apply the various tools, concepts, and principles of economics and quantitative methods to analyze and to develop solutions to economic problems in a clear and concise written form.
3. Demonstrate a "frontier" level competency and familiarity with the literature in the student's perceived specialty area.
4. Demonstrate the ability to conduct independent and original research in economics.
5. Have the skills necessary to qualify for teaching positions at the university and college levels, and for research positions in the public or private sector.
6. Program graduates will be able to obtain employment that uses the level of expertise obtained in the Ph.D. program.
7. Complete these goals according to the timeline described in the graduate program guidelines.

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Ph.D. - Communication and Information Sciences program

Key: I=Introduced, R=Reinforced, M=Mastered, A=Assessed

Program Element	SLO1	SLO2	SLO3	SLO4	SLO5
CIS 701: Communication/Information Theories	IRA	IRA			IR
CIS 702: Communication/Information Technologies	IRA	IRA			IR
CIS 703: Communication/Information Research Methods	IRA	IRA	IRA	IR	IR
CIS 704: Special Topics in CIS	IRA	IRA			IR
CIS 720: Interdisciplinary Seminar in CIS	IR	IR	IR	IR	IRM
Research methods course outside CIS	IRMA	IR	IR	IR	
Coursework to prepare for secondary exams	IRMA				
Coursework to prepare for primary exam	IRMA	IRMA			
Secondary Exams (2)	A	A			
Primary Exam	A	A	A		A
Faculty Mentoring Program			IR	IR	RM
CIS 699 Directed Research	RM	RM	RM	RM	RM
Research Publication Requirement			MA	IRA	MA
Dissertation Proposal (including defense)			RMA	IRA	MA
Dissertation (including defense)			MA	IRMA	MA

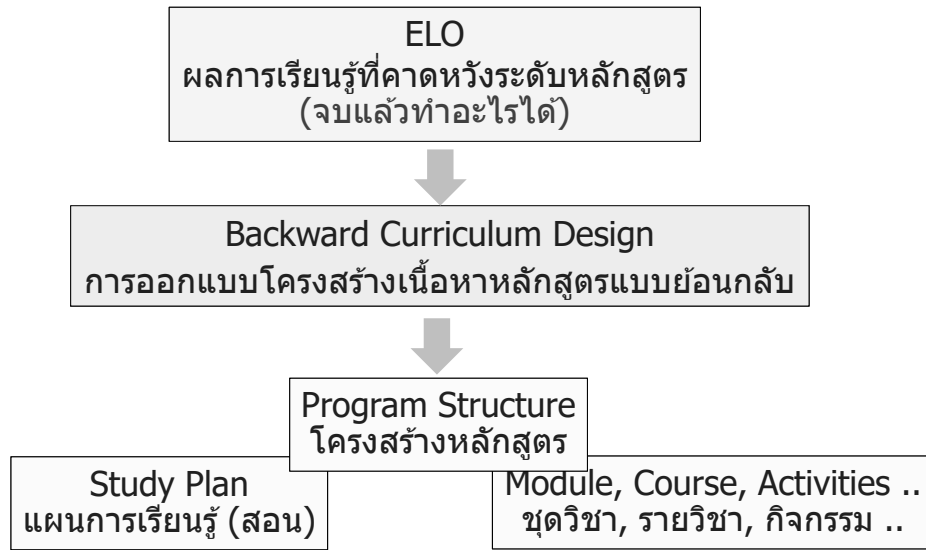
- (SLO1) Demonstrate understanding of research methods and subject knowledge in the field of Communication and Information Sciences
- (SLO2) Synthesize diverse data, theories, and methods
- (SLO3) Demonstrate the ability to conduct research
- (SLO4) Propose and conduct original research
- (SLO5) Develop and articulate a professional identity as a contributing member of a research community

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ระดับหลักสูตร

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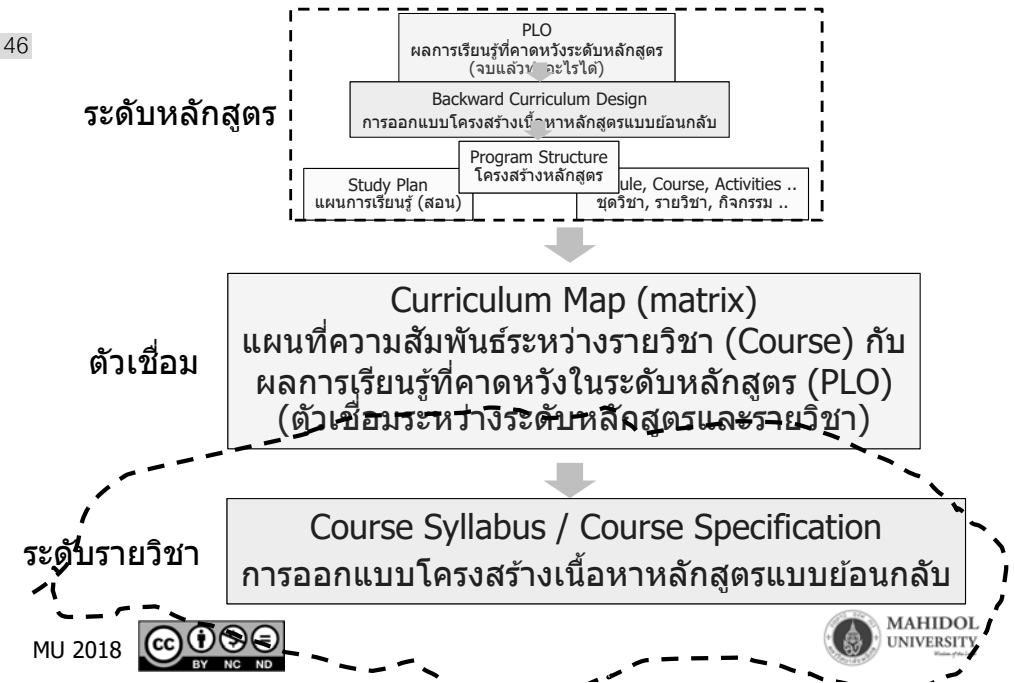


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ระดับรายวิชา (ขุดวิชา, กิจกรรม ..)

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5 Basic steps in a curriculum design based on OBE

- 1 Clearly defining the Expected Learning Outcomes
- 2 Backward Curriculum designed to align with ELOs
- 3 Construct Program Structure and Content that the sequence and integration are achieved.
- 4 Construct appropriate Course Syllabus that the alignment of CLOs with ELOs and constructive alignment of each course are achieved.
- 5 Review Program Constructive Alignment to ensure the ELOs can be achieved

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Development of Course Learning Outcomes (CLOs)

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Curriculum Map: Course matrix

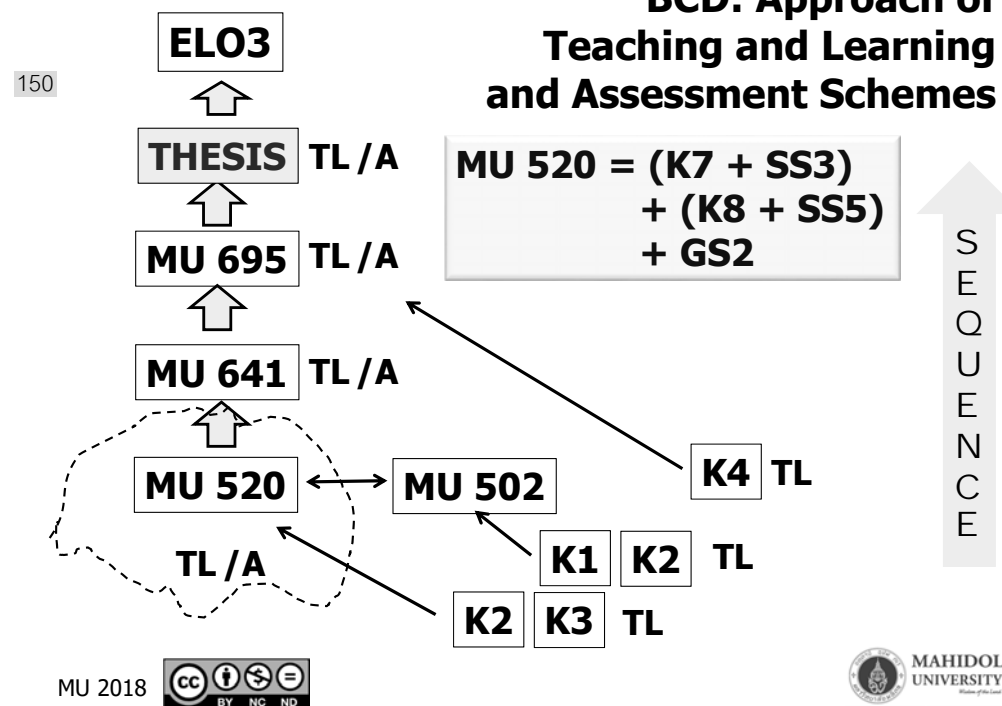
149

COURSES	ELO1	ELO2	ELO3	ELO4	ELO5
Core Courses					
MU 501	K5/SS1			GS1	
MU 502		K6/SS2	K6/SS4		GS2
MU 520	K7/SS3		K8/SS5		GS2
Specialize Courses					
MU 621	SS6			GS1	
MU 641		SS7	SS8		GS2
MU 695	SS9	SS10	SS11/A	GS3	GS4
THESIS	SS1-11			GS1-4	

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BCD: Approach of Teaching and Learning and Assessment Schemes



MU 520 = (K7 + SS3) + (K8 + SS5) + GS2

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CLOs should be developed from CM and BCD

K/S	Course Learning Outcome (CLO)	ELO
K7	Action verb + Object + modification	1
K8	Action verb + Object + modification	3
SS3 + GS2	Action verb + Object + modification	1,5
SS5 + GS2	Action verb + Object + modification	3,5

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Constructive Alignment at course level

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MU 520: (K7 + SS3) + (K8 + SS5) + GS2

- CLO 1: (ELO)
 CLO 2: Action Verb + Object + Modification... (ELO)
 CLO 3 (ELO)
 CLO 4 (ELO)

	Content	CLO No.	T/L Approach	Assessment Scheme
1				
2				
3				
4				

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Exercise 4: Formulation of Course Learning Outcomes



Formulation of a course learning outcomes (CLOs)

Procedures:

1. Select a course (subject) in the curriculum map
2. Using the relationship of the course in curriculum map and BCD with ELO to construct CLOs.
3. Please aware of sequence and integration of student learning

Homework

- 1: Expected Learning Outcomes
- 2: Backward curriculum design
- 3: Programme structure, study plan
4. Curriculum mapping (constructive alignment)
- 5: Course Learning Outcomes

What's next..... When?



Thank You

... for joining us.