How do I link Learning Outcomes to Teaching and Learning Activities and to Assessment?

Framework of Qualifications for European Higher Education Area (EHEA)

- Conference of European Ministers Responsible for Higher Education in Bergen, Norway (2005) adopted the overarching framework for qualifications in EHEA.
- This framework shows
  - Three cycles (including within national contexts, the possibility of intermediate qualifications)
  - Generic descriptors for each cycle based on learning outcomes and competences.
  - ECTS credit ranges in the first and second cycles (i.e. Bachelors and Masters levels).
- Ministers committed themselves to drawing up National Frameworks for Qualifications compatible with Framework of Qualifications for European Higher Education area by 2010.

Bergen, Norway (2005)

Dublin Descriptors

- Descriptors drawn up at meeting of Education Ministers in Dublin
- These generic descriptors are used in The Framework for Qualifications of EHEA (Bologna Process). Adopted in 2005.
- The Descriptors are generic statements that assist us to write Learning Outcomes.

First Cycle : Bachelor's Cycle

[180 – 240 ECTS credits]

	Outcomes	ECTS Credits
First cycle qualification	Qualifications that signify completion of **the first cycle** are awarded to students who: • have demonstrated knowledge and understanding in a field of study that builds upon their general secondary education, and is typically at a level that, whilst supported by advanced textbooks, includes some aspects that will be informed by knowledge of the forefront of their field of study; • can apply their knowledge and understanding in a manner that indicates a professional approach to their work or vocation, and have competences typically demonstrated through devising and sustaining arguments and solving problems within their field of study; • have the ability to gather and interpret relevant data (usually within their field of study) to inform judgments that include reflection on relevant social, scientific or ethical issues; • can communicate information, ideas, problems and solutions to both specialist and non-specialist audiences; • have developed those learning skills that are necessary for them to continue to undertake further study with a high degree of autonomy.	Typically include 180-240 ECTS credits

Minimum of 3 years = 180 credits

4 years = 240 credits.

Second Cycle: Master's cycle
[60 – 120 ECTS credits]

Second cycle qualification	Qualifications that signify completion of **the second cycle** are awarded to students who: • have demonstrated knowledge and understanding that is founded upon and extends and/or enhances that typically associated with the first cycle, and that provides a basis or opportunity for originality in developing and/or applying ideas, often within a research context; • can apply their knowledge and understanding, and problem solving abilities in new or unfamiliar environments within broader (or multidisciplinary) contexts related to their field of study; • have the ability to integrate knowledge and handle complexity, and formulate judgments with incomplete or limited information, but that include reflecting on social and ethical responsibilities linked to the application of their knowledge and judgments; • can communicate their conclusions, and the knowledge and rationale underpinning these, to specialist and non-specialist audiences clearly and unambiguously; • have the learning skills to allow them to continue to study in a manner that may be largely self-directed or autonomous.	Typically include 90-120 ECTS credits, with a minimum of 60 credits at the level of the 2nd cycle

1 year
or
2 years

Third Cycle: Doctoral cycle

[Number of ECTS credits not specified]

Third cycle qualification	Qualifications that signify completion of **the third cycle** are awarded to students who: • have demonstrated a systematic understanding of a field of study and mastery of the skills and methods of research associated with that field; • have demonstrated the ability to conceive, design, implement and adapt a substantial process of research with scholarly integrity; • have made a contribution through original research that extends the frontier of knowledge by developing a substantial body of work, some of which merits national or international refereed publication; • are capable of critical analysis, evaluation and synthesis of new and complex ideas; • can communicate with their peers, the larger scholarly community and with society in general about their areas of expertise; • can be expected to be able to promote, within academic and professional contexts, technological, social or cultural advancement in a knowledge based society.	Not specified

See two page summary of framework of qualifications on:
www.ond.vlaanderen.be/hogeronderwijs/bologna/documents/Framework_qualificationsforEHEA-May2005.pdf

Time involved in various cycles

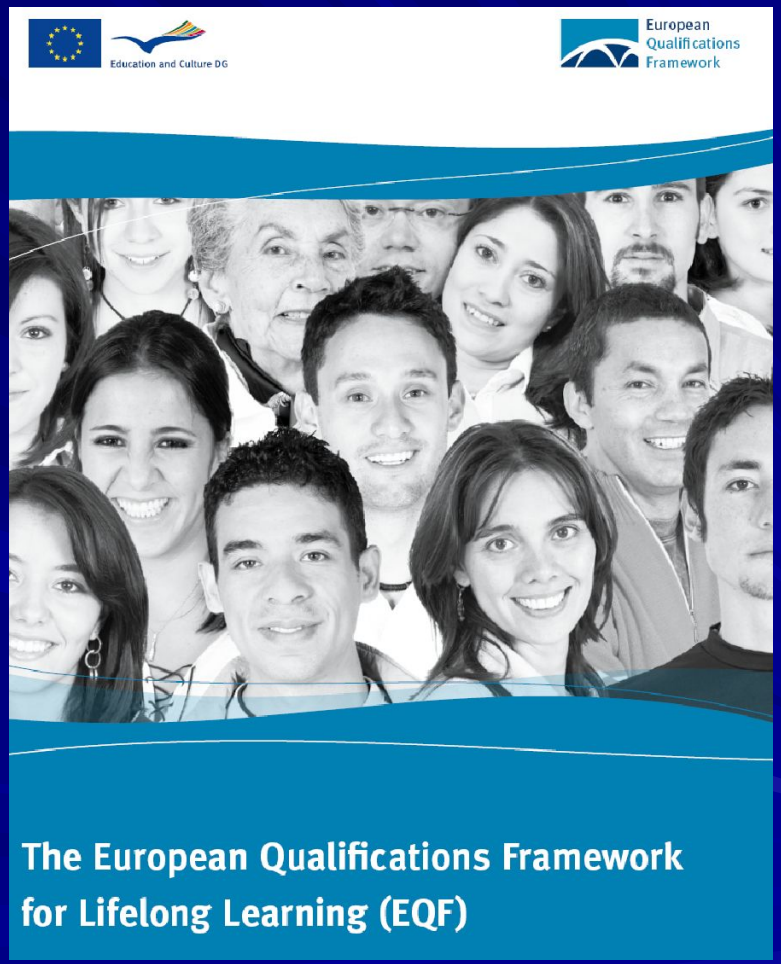
- Bachelor's degree = 3 or 4 years
- Master's degree = 1 or 2 years
- Doctoral degree = 3 years

Each of the three Bologna cycles is described in terms of learning outcomes as outlined in the "Dublin descriptors" (2005).

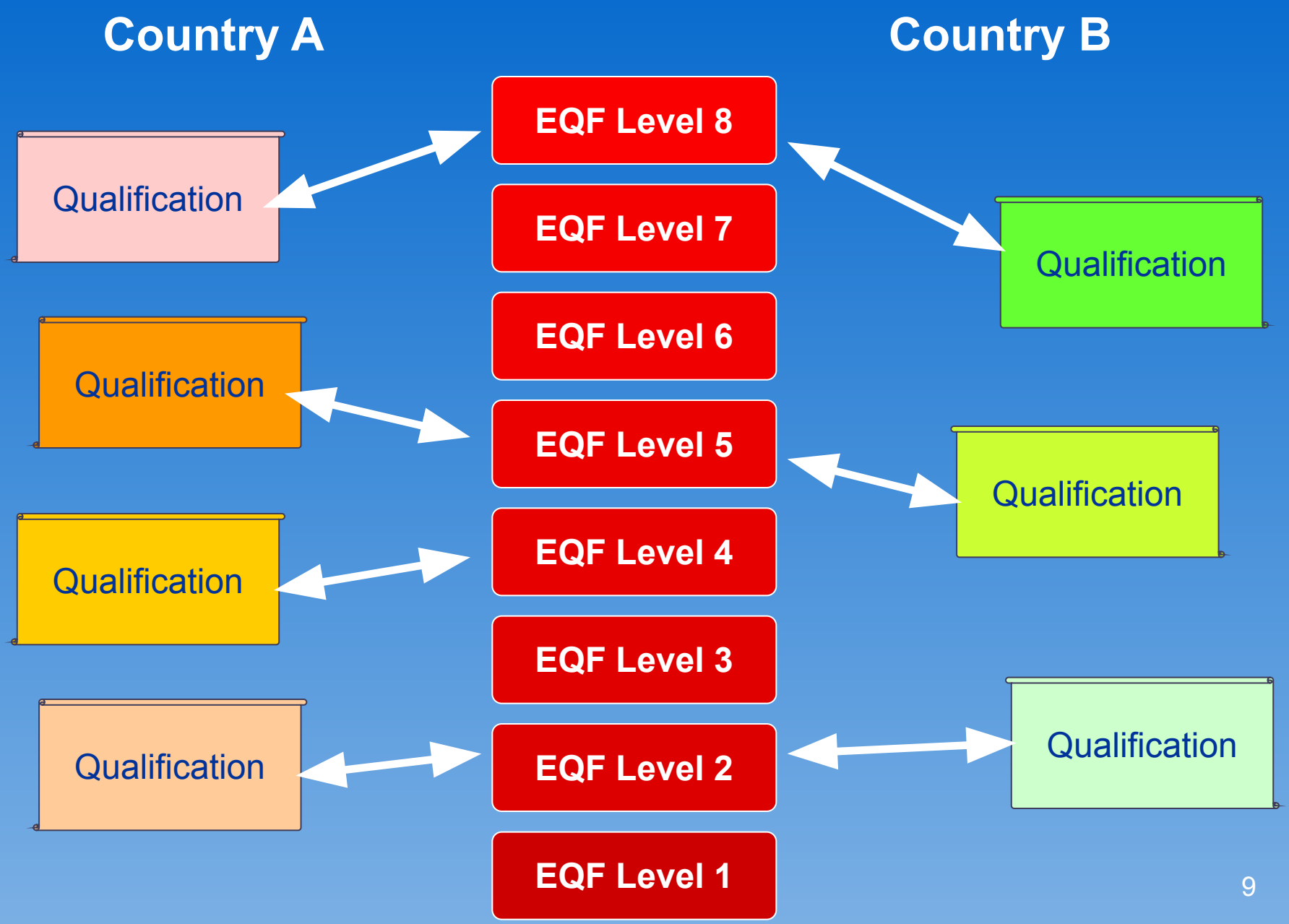
Note: The three cycles are closer to models in the UK and Ireland than in many countries of continental Europe where the model is based on the Magister or Diploma.

European Qualifications Framework for Lifelong Learning (EQF)

- Adopted by EU in 2008.
- A common European reference framework that links together the qualification systems of EU countries.
- A “Translation Device” to make qualifications easier to understand.
- Has 8 levels with a set of descriptors for each level. These descriptors describe the learning corresponding to each level under the heading of knowledge, skills and competence.



Education and Culture



THE EUROPEAN QUALIFICATIONS FRAMEWORK FOR LIFELONG LEARNING

DESCRIPTORS DEFINING LEVELS IN THE EUROPEAN QUALIFICATIONS FRAMEWORK (EQF)

		KNOWLEDGE	SKILLS	COMPETENCE
Each of the 8 levels is defined by a set of descriptors indicating the learning outcomes relevant to qualifications at that level in any system of qualifications.		In the context of EQF, knowledge is described as theoretical and/or factual.	In the context of EQF, skills are described as cognitive (involving the use of logical, intuitive and creative thinking) and practical (involving manual dexterity and the use of methods, materials, tools and instruments).	In the context of EQF, competence is described in terms of responsibility and autonomy.
LEVEL 6**	The learning outcomes relevant to **Level 6** are	→ advanced knowledge of a field of work or study, involving a critical understanding of theories and principles	→ advanced skills, demonstrating mastery and innovation, required to solve complex and unpredictable problems in a specialised field of work or study	→ manage complex technical or professional activities or projects, taking responsibility for decision-making in unpredictable work or study contexts → take responsibility for managing professional development of individuals and groups
LEVEL 7***	The learning outcomes relevant to **Level 7** are	→ highly specialised knowledge, some of which is at the forefront of knowledge in a field of work or study, as the basis for original thinking and/or research → critical awareness of knowledge issues in a field and at the interface between different fields	→ specialised problem-solving skills required in research and/or innovation in order to develop new knowledge and procedures and to integrate knowledge from different fields	→ manage and transform work or study contexts that are complex, unpredictable and require new strategic approaches → take responsibility for contributing to professional knowledge and practice and/or for reviewing the strategic performance of teams
LEVEL 8****	The learning outcomes relevant to **Level 8** are	→ knowledge at the most advanced frontier of a field of work or study and at the interface between fields	→ the most advanced and specialised skills and techniques, including synthesis and evaluation, required to solve critical problems in research and/or innovation and to extend and redefine existing knowledge or professional practice	→ demonstrate substantial authority, innovation, autonomy, scholarly and professional integrity and sustained commitment to the development of new ideas or processes at the forefront of work or study contexts including research

GRID OF LEVEL INDICATORS

National Framework of Qualifications
Creatlóra Náisiúnta na gCáilíochtaí

LEVEL 6	LEVEL 7	LEVEL 8	LEVEL 9	LEVEL 10	
Specialised knowledge of a broad area	Specialised knowledge across a variety of areas.	An understanding of the theory, concepts and methods pertaining to a field (or fields) of learning.	A systematic understanding of knowledge, at, or informed by the forefront of a field of learning.	A systematic acquisition and understanding of a substantial body of knowledge which is at the forefront of a field of learning.	**Knowledge** *Breadth*
Some theoretical concepts and abstract thinking, with significant underpinning theory.	Recognition of limitations of current knowledge and familiarity with sources of new knowledge; integration of concepts across a variety of areas.	Detailed knowledge and understanding in one or more specialised areas, some of it at the current boundaries of the field(s).	A critical awareness of current problems and/or new insights, generally informed by the forefront of a field of learning.	The creation and interpretation of new knowledge, through original research or other advanced scholarship, of a quality to satisfy review by peers.	**Knowledge** *Kind*
Demonstrate comprehensive range of specialised skills and tools.	Demonstrate specialised technical, creative or conceptual skills and tools across an area of study.	Demonstrate mastery of a complex and specialised area of skills and tools; use and modify advanced skills and tools to conduct closely guided research, professional or advanced technical activity.	Demonstrate a range of standard and specialised research or equivalent tools and techniques of enquiry.	Demonstrate a significant range of the principal skills, techniques, tools, practices and/or materials which are associated with a field of learning; develop new skills, techniques tools, practices and/or materials.	**Know-How & Skill** *Range*
Formulate responses to well-defined abstract problems.	Exercise appropriate judgement in planning, design, technical and/or supervisory functions related to products, services, operations or processes.	Exercise appropriate judgement in a number of complex planning, design, technical and/or management functions related to products, services, operations or processes, including recounting.	Select from complex and advanced skills across a field of learning; develop new skills to a high level, including novel and emerging techniques.	Respond to abstract problems that expand and redefine existing procedural knowledge.	**Know-How & Skill** *Selectivity*
Act in a range of varied and specific contexts involving creative and non-routine activities; transfer and apply theoretical concepts and/or technical or creative skills to a range of contexts.	Utilise diagnostic and creative skills in a range of functions in a wide variety of contexts.	Use advanced skills to conduct research, or advanced technical or professional activity, accepting accountability for all related decision making; transfer and apply diagnostic and creative skills in a range of contexts.	Act in a wide and often unpredictable variety of professional levels and ill-defined contexts.	Exercise personal responsibility and largely autonomous initiative in complex and unpredictable situations, in professional or equivalent contexts.	**Competence** *Context*
Exercise substantial personal autonomy and often take responsibility for the work of others and/or for allocation of resources; form, and function within, multiple complex and heterogeneous groups.	Accept accountability for determining and achieving personal and/or group outcomes; take significant or supervisory responsibility for the work of others in defined areas of work.	Act effectively under guidance in a peer relationship with qualified practitioners; lead multiple, complex and heterogeneous groups.	Take significant responsibility for the work of individuals and groups; lead and initiate activity.	Communicate results of research and innovation to peers; engage in critical dialogue; lead and originate complex social processes.	**Competence** *Role*
Learn to evaluate own learning and identify needs within a structured learning environment; assist others in identifying learning needs.	Take initiative to identify and address learning needs and interact effectively in a learning group.	Learn to act in variable and unfamiliar learning contexts; learn to manage learning tasks independently, professionally and ethically.	Learn to self-evaluate and take responsibility for continuing academic/professional development.	Learn to critique the broader implications of applying knowledge to particular contexts.	**Competence** *Learning to Learn*
Express an internalised personal world view, reflecting engagement with others.	Express an internalised, personal world view, manifesting solidarity with others.	Express a comprehensive, internalised, personal world view, manifesting solidarity with others.	Scrutinise and reflect on social norms and relationships and act to change them.	Scrutinise and reflect on social norms and relationships and lead action to change them.	**Competence** *Insight*

Some Further Points about EQF

- The 8 levels span the full scale of qualifications.
- Work started in 2004 in response to requests from member states.
- The EQF is compatible with the EHEA framework and cycle descriptors of Bologna Process.
- Whilst the Bologna descriptors were developed specifically for higher education, the EQF is a lifelong learning framework.
- The EQF emphasises the results of learning rather than focussing on inputs such as length of study.
- The EQF defines a learning outcome as “a statement of what a learner knows, understands and is able to do on completion of a learning process”.
- Each of the 8 reference levels are described in terms of learning outcomes.

- The EQF supports providers of education and training by increasing transparency of qualifications awarded outside the national systems, e.g. by sectors and multinational companies. International sectoral organisations can relate their qualifications systems to a common European reference point. Thus, relationship beween international sectoral qualifications and national qualification systems is clarified
- The EU recommends enhanced cooperation in vocational education and training within the EQF.
- The EQF describes levels of qualifications. It does not award qualifications. Awarding of qualifications is still left to national qualification bodies.
- Main users of EQF will be bodies in charge of national and/or sectoral qualification systems and frameworks.
- Generic descriptors of Bologna cycles and EQF are not specific enough to be used as programme learning outcomes.

	EHEA Framework (Bologna)	European Qualifications Framework for Lifelong Learning (EQF) EU only
Honours Bachelor Degree	First cycle	Level 6
Masters Degree	Second cycle	Level 7
Doctorate	Third cycle	Level 8

Relationship between Dublin Descriptors of Bologna Process and reference levels of European Qualifications Framework

*Qualifications that signify completion of the **first cycle** are awarded to students who:*	EQF-level 6
have demonstrated knowledge and understanding in a field of study that builds upon their general secondary education[27], and is typically at a level that, whilst supported by advanced textbooks, includes some aspects that will be informed by knowledge of the forefront of their field of study;	Use detailed theoretical and practical knowledge of a field. Some knowledge is at the forefront of the field and will involve a critical understanding of theories and principles Demonstrate mastery of methods and tools in a complex and specialised field and demonstrate Innovation in terms of methods used Devise and sustain arguments to solve problems
can apply their knowledge and understanding in a manner that indicates a professional[2] approach to their work or vocation, and have competences[3] typically demonstrated through devising and sustaining arguments and solving problems within their field of study;	Demonstrate administrative design, resource and team management responsibilities in work and study contexts that are unpredictable and require that complex problems are solved where there are many interacting factors Show creativity in developing projects and show initiative in management processes that includes the training of others to develop team performance
have the ability to gather and interpret relevant data (usually within their field of study) to inform judgements that include reflection on relevant social, scientific or ethical issues;	Consistently evaluate own learning and identify learning needs
can communicate information, ideas, problems and solutions to both specialist and non-specialist audiences;	Communicate, ideas, problems and solutions to both specialist and non-specialist audiences using a range of techniques involving qualitative and quantitative information Express a comprehensive internalised personal world view manifesting solidarity with others
have developed those learning skills that are necessary for them to continue to undertake further study with a high degree of autonomy.	Gather and interpret relevant data in a field to solve problems Demonstrate experience of operational interaction within a complex environment Make judgements based on social and ethical issues that arise in work or study

National Framework of Qualifications

- Putting the Bologna Process into practice.
- A national framework of qualifications “is an instrument for the classification of qualifications according to a set of criteria for specified levels of learning achieved, which aims to integrate and coordinate national qualifications subsystems and improve the transparency, access, progression and quality of qualifications in relation to the labour market and civil society”.

(EQF 2008)

Paperwork for Programme Recognition, Accreditation and Review

APPENDIX 1 Sub-Strands of knowledge, skills and competences for level 8 Qualifications in the NQAI framework.
Note; This grid will help you to write module learning outcomes and programme learning outcomes for level 8 programmes.

	Knowledge *Breadth*	**Knowledge** *Kind*	**Know-How and Skill** *Range*	**Know-How and Skill** *Selectivity*	**Competence** *Context*	**Competence** *Role*	**Competence** *Learning to Learn*	**Competence** *Insight*
	An understanding of the theory, concepts and methods pertaining to a field (or fields) of learning.	Detailed knowledge and understanding in one or more specialised areas, some of it at the current boundaries of the field(s).	Demonstrate mastery of a complex and specialised area of skills and tools; use and modify advanced skills and tools to conduct closely guided research,professional or advanced technical activity.	Exercise appropriate judgement in a number of complex planning, design, technical and/or management functions related to products, services, operations or processes, including resourcing.	Use advanced skills to conduct research,or advanced technical or professional activity, accepting accountability for all related decision making; transfer and apply diagnostic and creative skills in a range of contexts.	Act effectively under guidance in a peer relationship with qualified practitioners; lead multiple, complex and heterogeneous groups.	Learn to act in variable and unfamiliar learning contexts; learn to manage learning tasks independently, professionally and ethically.	Express a comprehensive, internalised, personal world view, manifesting solidarity with others.
Programme Learning outcome 1								
Programme Learning outcome 2								
Programme Learning outcome 3	Etc.							

APPENDIX 2 Sub-Strands of knowledge, skills and competences for level 9 Qualifications in the NQAI framework.
Note; This grid will help you to write module learning outcomes and programme learning outcomes for level 9 programmes.

	Knowledge *Breadth*	**Knowledge** *Kind*	**Know-How and Skill** *Range*	**Know-How and Skill** *Selectivity*	**Competence** *Context*	**Competence** *Role*	**Competence** *Learning to Learn*	**Competence** *Insight*
	A systematic understanding of knowledge, at, or informed by, the forefront of a field of learning.	A critical awareness of current problems and/or new insights, generally informed by the forefront of a field of learning	Demonstrate a range of standard and specialised research or equivalent tools and techniques of enquiry.	Select from complex and advanced skills across a field of learning; develop new skills to a high level, including novel and emerging techniques.	Act in a wide and often unpredictable variety of professional levels and illdefined contexts.	Take significant responsibility for the work of individuals and groups; lead and initiate activity	Learn to self-evaluate and take responsibility for continuing academic/professional development.	Scrutinise and reflect on social norms and relationships and act to change them.
Programme Learning outcome 1								
Programme Learning outcome 2								
Programme Learning outcome 3								
Programme Learning outcome 4 etc								

Language for writing Programme Learning Outcomes for NQF

Knowledge - *Breadth*

- Discuss a wide variety of….
- Outline a broad range of fundamental concepts…..
- Describe the theories and concepts in the field of….
- Identify a range of processes used in….
- Discuss relationships between the various areas of…..

Knowledge - *Kind*

- Recognise limitations in the areas of…
- Link relevant theories to the development of a design to….
- Utilise appropriate models and techniques in the area of …. to
- Examine current theory in the area of…
- Critique modern theories in the area of ….
- Examine and evaluate current problems in the area of …..

Know-How and Skill - *Range*

- Apply a range of techniques to solve…
- Modify techniques in the area of ….. to solve….
- Link theory with practice in order to…
- Analyse data to facilitate decision making in the area of…
- Utilise appropriate methods, skills and techniques to solve….
- Exhibit proficiency in using a broad range of routine laboratory techniques in the field of…..

Know How and Skill – *Selectivity*

- Select and apply the most suitable techniques to solve problems in the areas of…..
- Apply appropriate decision making to achieve high standards of performance in the area of….
- Identify appropriate solutions to plan future developments in the area of…
- Select appropriate instrumental methods to…
- Utilise existing stragies to design……
- Evaluate existing problems in the area of ….in order to….

Competence - *Context*

- Combine technical skills to define a problem in the area of ….. and implement suggested solutions to….
- Apply technical knowledge in the area of … to solve problems related to…
- Recognise existing strategies to facilitate solutions in the area of…..
- Formulate options and solutions to…
- Diagnose problems and suggest solutions in the area of….
- Transfer methodologies to new applications in the area of…..
- Integrate a range of acquired transferable skills such as …….

Competence *Role*

- Work as a member of a team to manage….
- Initiate research ides and evaluate research related publications in the area of….
- Implement work objectives and exercise leadership in …..
- Interpret relevant regulations in the area of ..
- Accept accountability for achieving…
- Work autonomously or as a member of a team in order to…..

Competence - *Learning to Learn*

- Apply appropriate ethical considerations.
- Work ethically and professionally as part of a team…..
- Act appropriately in unfamiliar situations in the area of….
- Develop your personal capabilities in order to ….
- Engage with new developments and practices in order to…
- Recognise the need for life-long learning and professional development in the area of….
- Identify and address continuing requirements for professional development in the area of
- Contribute to the future development of the field of…….

Competence - *Insight*

- Recognise the relationship between science, technology and society in the area of….
- Display an appropriate standard of professional practice in the area of…
- Critically appraise research in the area of…. and evaluate the work of peers.
- Embrace responsibiity for the welfare of others….
- Display personal ethical standards in the area of…
- Articulate and defend the need for personal responsibility and ethical considerations in the workplace for…..

MAPPING OF PROGRAMME LEARNING OUTCOMES TO MODULE LEARNING OUTCOMES

APPENDIX 5 Grid indicating where the Programme Learning Outcomes are covered in the various modules and where the module learning outcomes map on to the Programme Learning Outcomes

	Programme Learning Outcome 1	Programme Learning Outcome 2	Programme Learning Outcome 3	Programme Learning Outcome 4	Programme Learning Outcome 5	Programme Learning Outcome 6	Programme Learning Outcome 7	Programme Learning Outcome 8	Programme Learning Outcome 9	Programme Learning Outcome 10
Module 1										
Module 2										
Module 3										
Module 4										
Module 5										
Module 6										
Module 7										
Module 8										
Module 9										
Module 10										
Module 11										
Module 12…. etc.										

Grid to show mapping of Programme Learning Outcomes on to Module Learning Outcomes

Programme learning outcomes	Nanotoxicology	Applied Pharmacology	Toxicology Testing Methods	Analytical Toxicology	Biochemical Toxicology	Molecular and Reproductive Toxicology	Law and regulation in Toxicology	Environmental Toxicology	Target Organ Toxicology	Practical Toxicology	Materials and Medical Device Toxicology	Project	Innovation and Entrepreneurship
PLO 1	X	X	X	X	X	X		X	X	X	X	X	
PLO 2	X		X	X	X	X		X	X	X	X	X	
PLO 3			X									X	
PLO 4			X									X	
PLO 5			X				X	X	X	X		X	
PLO 6	X	X						X	X			X	X
PLO 7							X				X	X	
PLO 8	X		X	X	X	X	X	X	X	X	X	X	X
PLO 9												X	X

Example of Mapping of Programme Learning Outcomes on to Module Learning Outcomes

Programme learning outcomes	Nanotoxicology	Applied Pharmacology	Toxicology Testing Methods	Analytical Toxicology	Biochemical Toxicology	Molecular and Reproductive Toxicology	Law and regulation in Toxicology	Environmental Toxicology	Target Organ Toxicology	Practical Toxicology	Materials and Medical Device Toxicology	Project	Innovation and Entrepreneurship
Discuss the interdisciplinary relationship between the various specialised areas of Toxicology	X	X	X	X	X	X		X	X	X	X	X	
Critically examine and evaluate current scientific problems in the area of Toxicology	X		X	X	X	X		X	X	X	X	X	
Exhibit laboratory skills in a broad range of laboratory experimental techniques.			X									X	

"The adoption of a learning outcomes approach represents more than simply expressing learning in terms of outcomes. It entails much more due to their significant implications for all aspects of curriculum design, delivery, expression, assessement and standards".

Adam S, 2004

Assessment of Learning Outcomes

- Having designed modules and programmes in terms of learning outcomes, we must now find out if our students have achieved these intended learning outcomes.
- *How will I know if my students have achieved the desired learning outcomes? How will I measure the extent to which they have achieved these learning outcomes?*
- Therefore, we must consider how to match the method of assessment to the different kinds of learning outcomes e.g. a Learning Outcome such as "Demonstrate good presentation skills" could be assessed by the requirement that each student makes a presentation to their peers.
- When writing learning outcomes the verb is often a good clue to the assessment technique.
- How can we design our examination system so that it tests if learning outcomes have been achieved?

Misconceptions about Assessment

- “A view of teaching as the transmission of authoritative knowledge has little space to accommodate the idea that different methods of assessment may be appropriate for the evaluation of different parts of the subject matter or that assessment techniques themselves should be the subject of serious study and reflection. In such a conception, lecturers see teaching, learning and assessment as tenuously related in a simple linear sequence”.
- “Assessment is something that follows learning, so there is no need to consider its function as a means of helping students to learn through diagnosing their errors and misconceptions and reinforcing their correct understanding”.
- “Assessment, like teaching, is something done to students ….Assessment classifies the students on the criterion of how well they have absorbed the data thus transmitted. What could be simpler?”

(Ramsden, 2005)

Formative Assessment

- Assessment **FOR** learning – gives feedback to students and teachers to help modify teaching and learning activities, i.e. helps inform teachers and students on progress being made.
- Assessment is integrated into the teaching and learning process.
- Clear and rich feedback helps improve performance of students (Black and Williams, 1998).
- Usually carried out at beginning or during a programme, e.g. coursework which gives feedback to students.
- Can be used as part of continuous assessment, but some argue that it should not be part of grading process (Donnelly and Fitzmaurice, 2005)

Summative Assessment

- Assessment that summarises student learning at end of module or programme – Assessm
- Sums up achievement – no other
- Generates a grade or mark.
- Usually involves assessment usin examination.
- Only a sample of the Learning Ou cannot assess all the Learning Ou

Continuous Assessment

- A combination of summative[illegible]ative assessment.
- Usually involves repeated s[illegible] assessments.
- Marks recorded.
- Little or no feedback given.

Assessment

- *"Assessment is the process of gathering and discussing information from multiple and diverse sources in order to develop a deep understanding of what students know, understand and can do with their knowledge as a result of their educational experiences"* (Huba and Freed, 2000)
- "A way of finding out what our students know and can do"

“Techniques” of assessment

- *Written:* tests, examinations, assignments
- *Practical:* skills testing; lab/workshop practice
- *Oral:* interviews, various formats
- *Aural:* listening tests
- *Project work:* individual/group; research/design
- *Field work:* data collection and reporting
- *Competence testing:* threshold standards
- *Portfolio :* combination of techniques

Common assessment techniques in Higher Education

- Paper/thesis
- Project
- Product development
- Performance
- Exhibition
- Case study.
- Clinical evaluation
- Oral exam
- Interview
- Research assignment
- Portfolio
- Others??

Example of Matching the Assessment to the Learning Outcome

Learning outcomes

1. Demonstrate good presentation skills.
2. Formulate food product
3. Identify an area for research
4. Identify signs and symptoms of MS in a patient

Assessment?

a) Multiple choice questions
b) Prepare a 1000-word research proposal
c) Lab-based project
d) Make a presentation to peers

To what extent has each Learning Outcome been achieved?

- Not a question of “yes” or “no” to achievement of Learning Outcomes.
- Rubric: A grading tool used to describe the criteria which are used in grading the performance of students.
- Rubric provides a clear guide as to how students’ work will be assessed.
- A rubric consists of a set of criteria and marks or grade associated with these criteria.

Linking learning outcomes and assessment criteria.

Learning outcome	Assessment criteria				
	Grade 1	**Grade 2 : 1**	**Grade 2 :2**	**Pass**	**Fail**
On successful completion of this module, students should be able to: •Summarise evidence from the science education literature to support development of a line of argument.	Outstanding use of literature showing excellent ability to synthesise evidence in analytical way to formulate clear conclusions.	Very good use of literature showing high ability to synthesise evidence in analytical way to formulate clear conclusions.	Good use of literature showing good ability to synthesise evidence in analytical way to formulate clear conclusions	Limited use of literature showing fair ability to synthesis e evidence to formulate conclusio ns.	Poor use of literature showing lack of ability to synthesise evidence to formulate conclusions

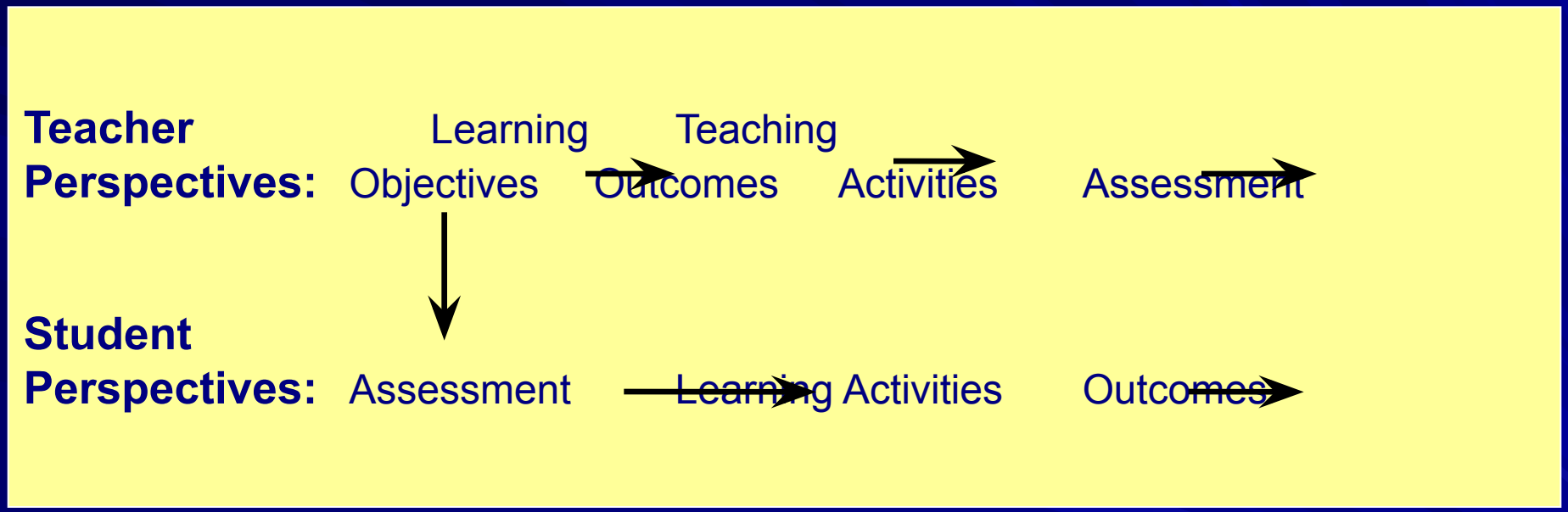
- Important to ensure that there is alignment between teaching methods, learning outcomes and assessment criteria.
- Clear expectations on the part of students of what is required of them are a vitally important part of students' effective learning (Ramsden, 2003)
- This correlation between teaching, learning outcomes and assessment helps to make the overall learning experience more transparent and meaningful for students.
- For the good teacher, learning outcomes do not involve a "paradigm shift".

Teaching for understanding

Learning outcomes

There is a dynamic equilibrium between teaching strategies and Learning Outcomes.

It is important that the assessment tasks mirror the Learning Outcomes since, as far as the students are concerned, the assessment *is* the curriculum: “From our students’ point of view, assessment always defined the actual curriculum” (Ramsden, 1992).
Biggs (2003) represents this graphically as follows:



“To the teacher, assessment is at the end of the teaching-learning sequence of events, but to the student it is at the beginning. If the curriculum is reflected in the assessment, as indicated by the downward arrow, the teaching activities of the teacher and the learner activities of the learner are both directed towards the same goal. In preparing for the assessment, students will be learning the curriculum” (Biggs 2003)

“Constructive Alignment” (Biggs, 2005)

Constructive

- The students construct understanding for themselves through learning activities. “Teaching is simply a catalyst for learning” (Biggs).
- “If students are to learn desired outcomes in a reasonably effective manner, then the teacher’s fundamental task is to get students to engage in learning activities that are likely to result in their achieving those outcomes…. It is helpful to remember that what the student does is actually more important in determining what is learned than what the teacher does” (Shuell, 1986)

Alignment

- Alignment refers to what the teacher does in helping to support the learning activities to achieve the learning outcomes.
- The teaching methods and the assessment are aligned to the learning activities designed to achieve the learning outcomes.
- Aligning the assessment with the learning outcomes means that students know how their achievements will be measured.

- Constructive alignment is the deliberate linking within curricula of aims, learning outcomes, learning and teaching activities and assessment.
- Learning Outcomes state what is to be achieved in fulfilment of the aims.
- Learning activities should be organised so that students will be likely to achieve those outcomes.
- Assessment must be designed such that students are able to demonstrate that they have met the learning outcomes.
- Constructive alignment is just a fancy name for “joining up the dots”.

(Morss and Murray, 2005)

Steps involved in linking Learning Outcomes, Teaching and Learning Activities and Assessment

1. Clearly define the learning outcomes.
2. Select teaching and learning methods that are likely to ensure that the learning outcomes are achieved.
3. Choose a technique or techniques to assess the achievement of the learning outcomes.
4. Assess the learning outcomes and check to see how well they match with what was intended

If the learning outcomes are clearly written, the assessment is quite easy to plan!

Linking Learning Outcomes, Teaching and Learning Activities and Assessment

Learning Outcomes	Teaching and Learning Activities	Assessment
Cognitive (Demonstrate: Knowledge, Comprehension, Application, Analysis, Synthesis, Evaluation) Affective (Integration of beliefs, ideas and attitudes) Psychomotor (Acquisition of physical skills)	Lectures Tutorials Discussions Laboratory work Clinical work Group work Seminar Peer group presentation etc.	•End of module exam. •Multiple choice tests. •Essays. •Reports on lab work and research project. •Interviews/viva. •Practical assessment. •Poster display. •Fieldwork. •Clinical examination. •Presentation. •Portfolio. •Performance. •Project work. •Production of artefact etc.

Learning outcomes Module ED2100	Teaching and Learning Activities	Assessment 10 credit module Mark = 200
Cognitive •Recognise and apply the basic principles of classroom management and discipline. •Identify the key characteristics of high quality science teaching. •Develop a comprehensive portfolio of lesson plans	Lectures (12) Tutorials (6) Observation of classes (6) of experienced science teacher (mentor)	End of module exam. Portfolio of lesson plans **(100 marks)**
Affective •Display a willingness to co-operate with members of teaching staff in their assigned school. •Participate successfully in Peer Assisted Learning project	Participation in mentoring feedback sessions in school (4) Participation in 3 sessions of UCC Peer Assisted Learning (PAL) Programme. Peer group presentation	Report from school mentor End of project report. **(50 marks)**
Psychomotor •Demonstrate good classroom presentation skills •Perform laboratory practical work in a safe and efficient manner.	Teaching practice 6 weeks at 2 hours per week. Laboratory work	Supervision of Teaching Practice Assessment of teaching skills **(50 marks)**

Does every learning outcome have to be assessed?

- In theory “yes” but in practice “no”.
- In some cases they have to be assessed, e.g. licence to practice (e.g. medicine) or to perform essential tasks (e.g. aircraft pilot).
- When assessment is limited purely to an examination paper, it may not be possible to assess all the Learning Outcomes in such a short space of time – sampling of Learning Outcomes.
- Even if all the Learning Outcomes are assessed on an examination paper, due to choice of questions, a student may not be assessed on all of them.

Learning Outcomes and Level Descriptors on Qualification Frameworks

- A Learning outcome on its own does not give us an indication of the level of that learning outcome in a National Qualifications Framework.
- The level of the programme in which the learning outcome (programme learning outcome or module learning outcome) is written must be indicated in the programme description.
- The institution in which the programme is being taught must ensure:
  - ✔ (a) that the programme learning outcomes map on to the relevant level in the National Qualifications Framework
  - ✔ (b) that the module learning outcomes map on to the programme learning outcomes.
  - ✔ (c) that within each module there is alignment between the Learning Outcomes, the Teaching and Learning Activities and the Assessment.

What other information, apart from the Learning outcomes is needed to describe a module?

- **Credit Weighting:** Number of ECTS credits.
- **Teaching Period(s):** Term 1, Term 2 or both. .
- **No. of Students:** Maximum number of students allowed to take the module.
- **Pre-requisite(s):** Module(s) that should already have been passed by student.
- **Co-requisite(s):** Another module that the student must take with this module.
- **Teaching Methods:** Details of number of lectures, tutorials, etc.
- **Module Co-ordinator:** Name of person in charge of module.
- **Lecturer(s):** Name(s) of person(s) teaching the module. .

Module Description (continued)

- **Module Objective:** A sentence stating the objective of the module.
- **Module Content:** A list of topics covered in the module.
- **Learning Outcomes:** On successful completion of this module, students should be able to:
  [List of learning outcomes].
- **Assessment:** Details of total mark for module and details of the breakdown of this total mark, e.g. written paper, continuous assessment, project, etc.
- **Compulsory Elements:** Any part of assessment that MUST be passed in order to pass the module, e.g. professional practice component.
- **Penalties (for late submission of Course/Project Work etc.):** Details of marks deducted for late submission.
- **Pass Standard and any Special Requirements for Passing Module:** The minimum mark that must be obtained in order to pass the module.
- **End of Year Written Examination Profile:** Number and duration of examination papers.
- **Requirements for Supplemental Examination:** Number and duration and date of repeat examination for those who fail the module.

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Making programme learning outcomes explicit for students of process and chemical engineering

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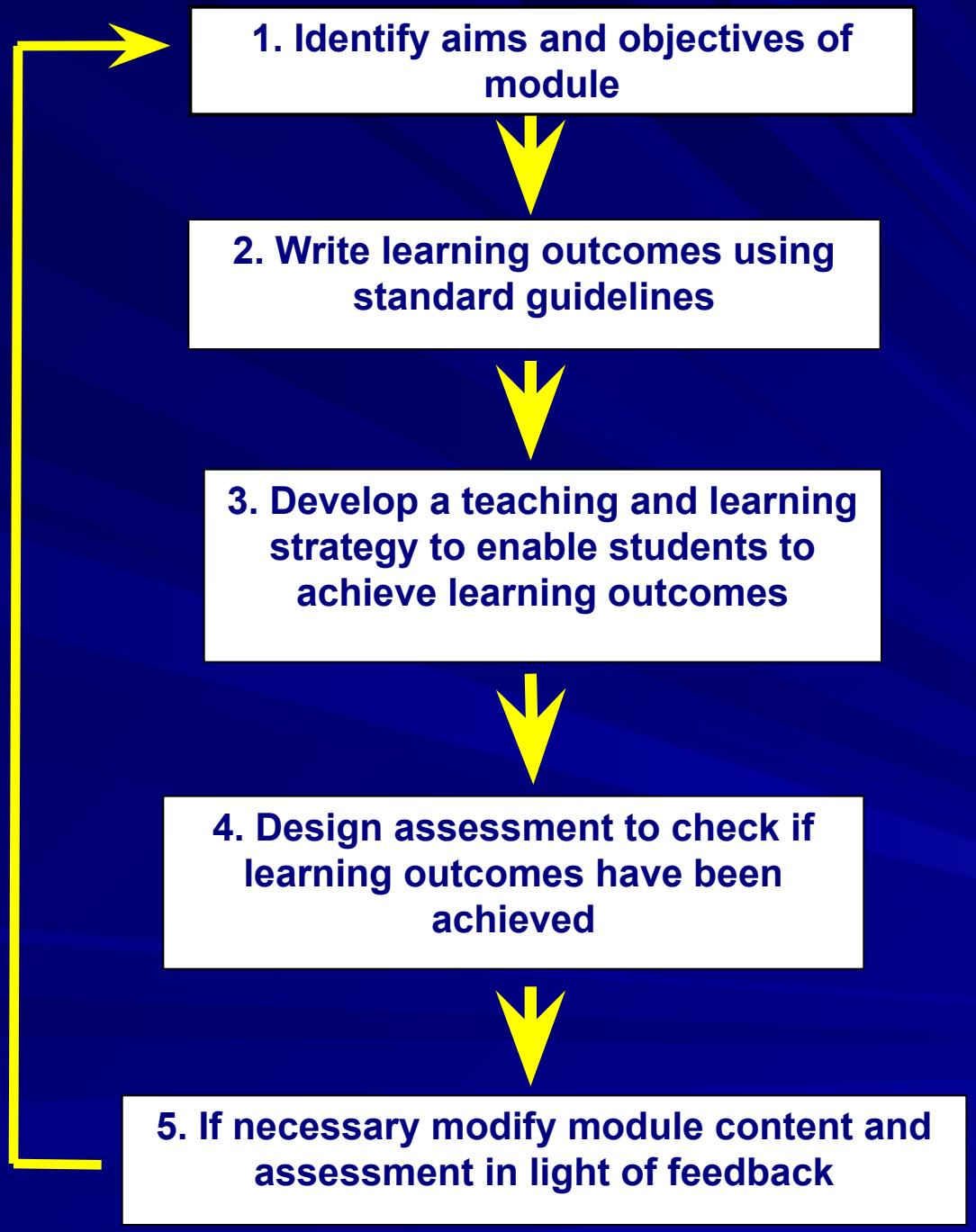
ABSTRACT

There is a global shift in education from solely content-driven teaching to teaching that takes learning outcomes into account. This movement underpins much of the educational reform in the area of engineering education. Programme learning outcomes for degrees in engineering education are more commonplace as more and more professional accrediting bodies require fulfillment or compliance with prescribed learning outcomes. However, the students may not be presented with these learning outcomes as they are often "hidden" in documentation submitted by institutions for accreditation purposes and hence may not be divulged to students. Undergraduate students (2006–2008) taking the BE degree programme in Process & Chemical Engineering at UCC were first surveyed to assess their level of knowledge of the learning outcomes concept and of the degree programme learning outcomes. The contents of two documents used in applications for accreditation by professional accreditation bodies as well as professional Institution guidelines were reviewed to formulate the degree programme learning outcomes which were presented to the students. These students were then surveyed after the presentation. The results of the questionnaire completed by students demonstrated a major improvement in their knowledge of both the concept of learning outcomes and also of the degree programme learning outcomes. It also showed that the students found the session to be of overall beneficial value.


1. Identify aims and objectives of module
2. Write learning outcomes using standard guidelines
3. Develop a teaching and learning strategy to enable students to achieve learning outcomes
4. Design assessment to check if learning outcomes have been achieved
5. If necessary modify module content and assessment in light of feedback

"Writing Learning Outcomes is a Process not an Event"