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Bologna Process Update: Engineering Education in Ireland

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INSTITIÚID TEICNEOLAÍOCHTA ÁTHA CLIATH

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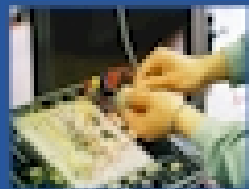
MEMBER of the EUROPEAN UNIVERSITY ASSOCIATION

Bologna Process Update

Engineering Education in Ireland

Mike Murphy

26 September, 2005



**Faculty of
Engineering**





- Over 5,000 engineering students:
 - 2,000 full-time students
 - 1,000 part-time students
 - 2,000 apprentice students
 - 150 post-grad students
- 250 academic staff
- 12:1 Student/Staff Ratio





The Bologna Process ... what problem are we trying to solve?

- “We confirm our commitment to coordinating our policies through the Bologna Process to establish the European Higher Education Area (EHEA) by 2010”
- “The European Higher Education Area is structured around three cycles, where each level has the function of preparing the student for the labour market”
- “We note with satisfaction that the two-cycle degree system is being implemented on a large scale”
- “Almost all countries have made provision for a quality assurance system”
- “We will draw up national action plans to improve the quality of the process associated with the recognition of foreign qualifications”
- “We see the development of national and European frameworks for qualifications as an opportunity to further embed lifelong learning in higher education”
- “We recognise that mobility of students and staff among all participating countries remains one of the key objectives of the Bologna Process. ... we reconfirm our commitment to facilitate the portability of grants and loans”



Bologna – essentials †

- Ultimate Goal: (automatic) recognition of qualifications in EHEA
- Objectives:
 - Degree structure and qualifications framework
 - Credit system
 - Quality Assurance
 - Social dimension



Bologna Process – National Report 2004 - 2005

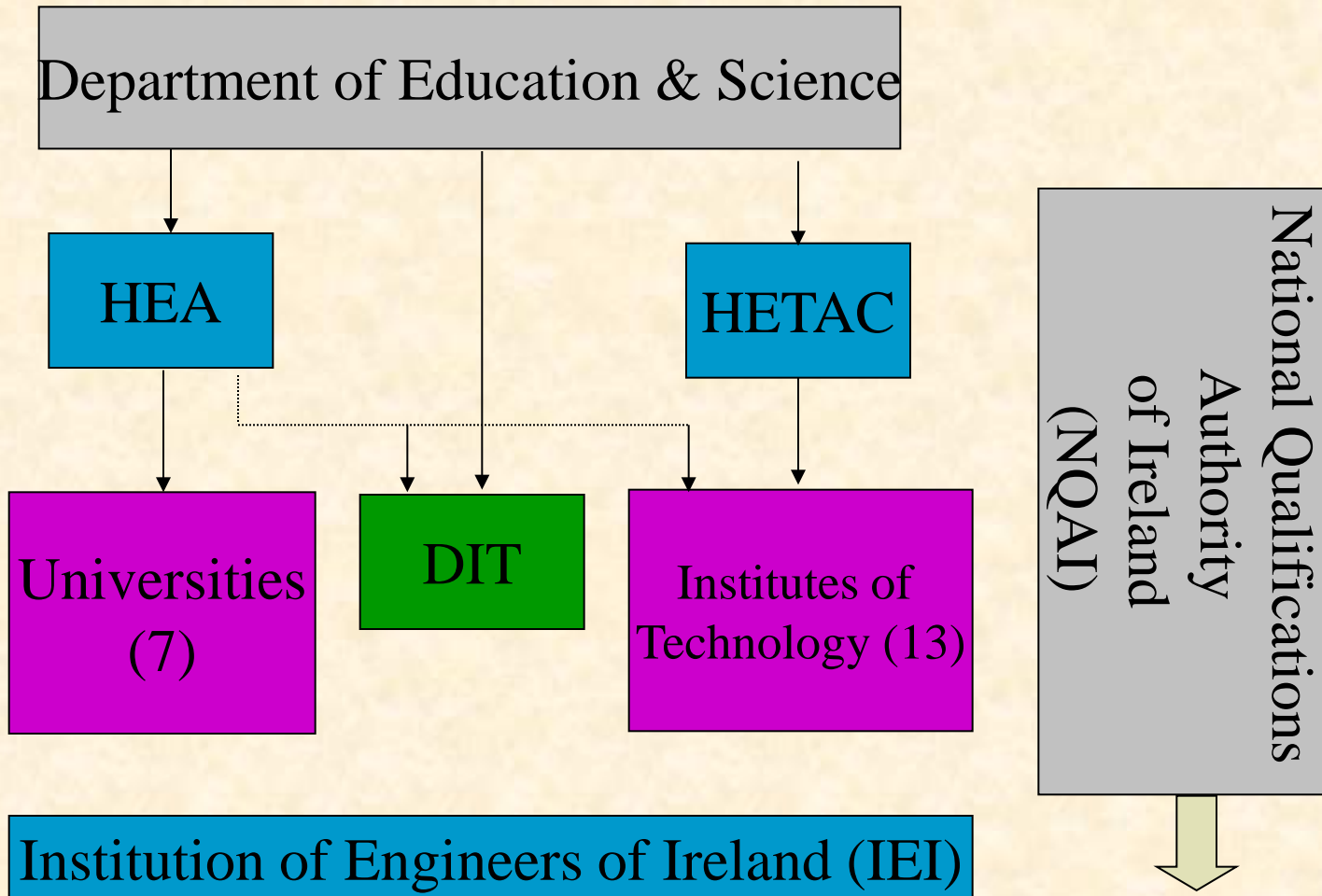
■ Starting at the end ...

– “Main challenges ahead for Ireland:

- Deepening the engagement of institutions in the process
- Ireland faces the challenge of encouraging further exchanges of staff and students within Europe (as promoted by the Bologna Process) in view of the cost of such exchanges for an off-shore island.” *Department of Education & Science*



The Players in Ireland ...



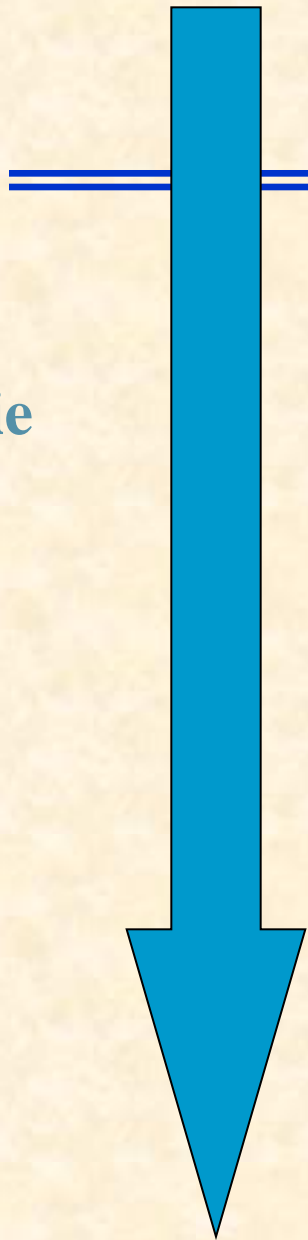


Statutory Powers

- Department of Education & Science has overall responsibility for higher education in Ireland
- Higher Education Authority (HEA) is responsible for furthering development of higher education and oversees the universities
- National Qualifications Authority of Ireland (NQAI) is responsible for establishing and maintaining the National Framework of Qualifications
- HETAC is the qualifications awarding body for the Institutes of Technology (except DIT)
- Institution of Engineers of Ireland (IEI) sets and maintains proper standards of professional and general education and training for admission to membership or to any category of membership of the Institution.



See www.nqai.ie



GRID OF LEVEL INDICATORS

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 resourcing.	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



Bologna Cycles

Bologna Cycles

National Framework of Qualifications

Providers

Bologna Cycles	National Framework of Qualifications		Providers
	Awards	Levels	
3	Doctoral Degree	10	DIT Institutes of Technology Private Colleges Other HEIs
2	Master Degree Post-grad Diploma Post-grad Certificate	9	
	Honours Bachelor Degree Higher Diploma	8	
1	Ordinary Bachelor Degree	7	
	Higher Certificate	6	

Universities



Some key developments

■ Diploma Supplement:

- The Irish National Bologna Committee under the chairmanship of the Department of Education & Science established a sub-committee to advise on the implementation of the Diploma Supplement. The format of the Diploma Supplement, including the text that describes the Irish educational system, has been agreed.

■ Quality Assurance:

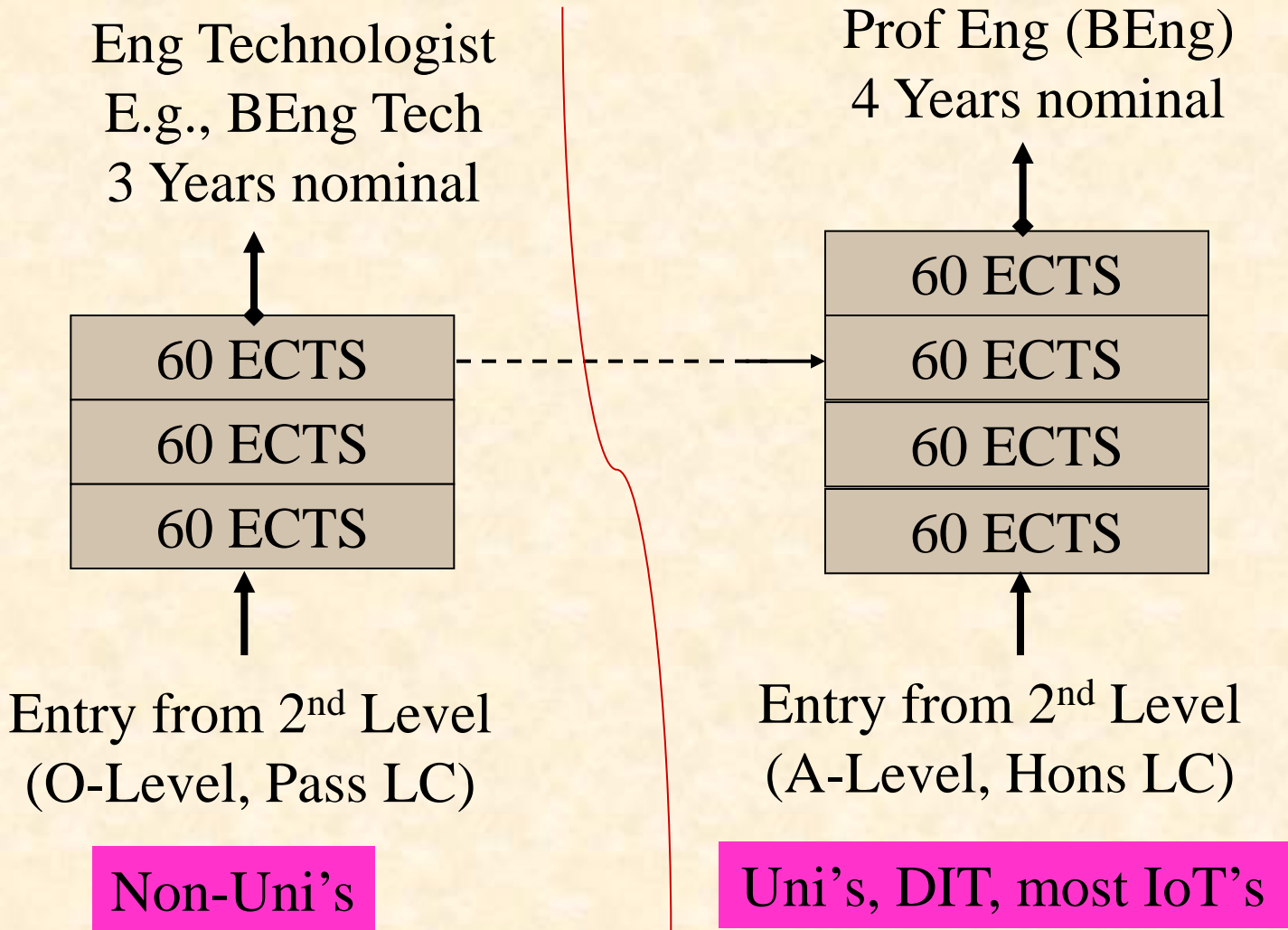
- IUQB, HETAC, HEA, DIT and USI have formed the Irish Higher Education Network. IHEQN has agreed and published principles of good practice in regard to quality assurance. The network will ensure full adherence to the requirements of the Bologna Process.

■ National Framework of Qualifications:

- NQAI, established in 1999, launched a comprehensive framework of qualifications in 2003



Current Engineering Structure



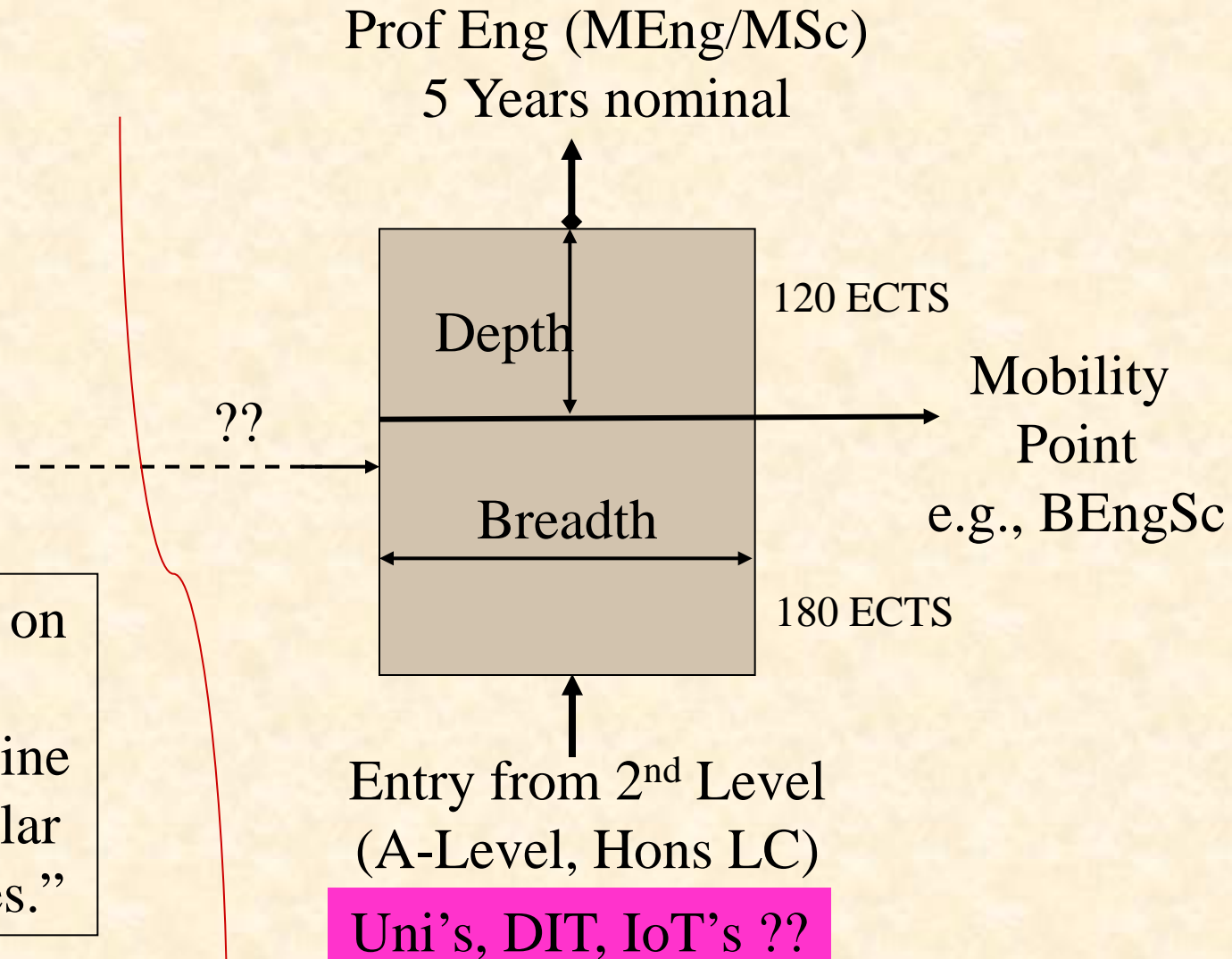


Accreditation and Bologna

- IEI has agreed that the educational standard for Chartered Engineer should be raised to Master degree level
- IEI initially proposed, discussed and adopted a 3 + 2 format with *applied* and *theoretical* 3 year streams.
- But ... straws in the wind ...
- New approach is an integrated 5-year programme for engineers with a pivot point/exit point after three years
- Proposed that 4-year and 5-year programmes will run simultaneously for an interim period



Proposed Engineering Structure



“The IEI position on the Bologna Declaration is in line with all other similar European Agencies.”



Further Reading

- The Institution of Engineers of Ireland (www.iei.ie)
 - Accreditation criteria for Engineering Education Programmes, November 2003
 - <http://www.iei.ie/Accred/accredcr.pasp>
- National Qualifications Authority of Ireland (NQAI) (www.nqai.ie)
 - National Framework of Qualifications – Determinations for the Outline National Framework of Qualifications
 - <http://www.nqai.ie/en/Publications/>
- See also Higher Education & Awards Council website (www.hetac.ie)
 - standards for engineering education:
 - http://www.hetac.ie/consultation_docs.cfm?sID=9