Bologna Process Update: Engineering Education in Ireland

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Bologna Process Update
Engineering Education in Ireland

Mike Murphy
26 September, 2005
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”

† Communique of the Conference of European Ministers Responsible for Higher Education, Bergen, 19-20 May 2005
Bologna – essentials †

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

† Prof. Dirk Van Damme, Ghent University, Head of Cabinet, Flemish Minister of Education
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*
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.
### GRID OF LEVEL INDICATORS

<table>
<thead>
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<th>LEVEL 6</th>
<th>LEVEL 7</th>
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<tbody>
<tr>
<td><strong>Knowledge Breadth</strong></td>
<td><strong>Knowledge Kind</strong></td>
<td><strong>Know-How &amp; Skill Range</strong></td>
<td><strong>Know-How &amp; Skill Selectivity</strong></td>
<td><strong>Competence Context</strong></td>
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<tr>
<td>Specialized knowledge of a broad area.</td>
<td>Recognize of limitations of current knowledge and familiarity with sources of new knowledge, integration of concepts across a variety of areas.</td>
<td>Demonstrate comprehensive range of specialized skills and tools.</td>
<td>Demonstrate mastery of a complex and specialized area of its life and body; use and modify understood skills and tools to conduct quality guided research, professional or advanced technical activity.</td>
<td>Demonstrate a range of standard and specialized research or equivalent tools and techniques of inquiry.</td>
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- **Examine appropriate judgment in planning, design, technical and safety supervisory functions related to products, services, operations or processes.**
- **Utilize diagnostic and creative skills in a range of functions in a wide variety of contexts.**
- **Use advanced skills to conduct research, 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.**
- **Take initiatives to identify and address learning needs and interact effectively in a learning group.**
- **Learn to act in variable and ever-changing learning contexts; learn to manage learning to do independently, professionally and ethically.**
- **Learn to self-evaluate and take responsibility for continuing academic/professional development.**
- **Learn to critique and evaluate learning outcomes and to identify and modify further learning needs.**
- **Express an interrelated, personal world view, reflecting engagement with others.**
- **Express a comprehensive, interrelated, personal world view, manifesting solidarity with others.**
- **Scrutinize and reflect on social norms and relationships and act to change them.**
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See www.nqai.ie
# Bologna Cycles

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<tr>
<td>1</td>
<td>Ordinary Bachelor Degree</td>
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<td>Higher Certificate</td>
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<table>
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<td>Ordinary Bachelor Degree</td>
<td>7</td>
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<tr>
<td>Higher Certificate</td>
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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
Engineering @ DIT: Challenging, Fun & Rewarding

Current Engineering Structure

Eng Technologist
E.g., BEng Tech
3 Years nominal

Prof Eng (BEng)
4 Years nominal

Entry from 2nd Level
(O-Level, Pass LC)
Non-Uni’s

Entry from 2nd Level
(A-Level, Hons LC)
Uni’s, DIT, most IoT’s

60 ECTS

60 ECTS

60 ECTS

60 ECTS

60 ECTS

60 ECTS

60 ECTS

60 ECTS

60 ECTS

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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

Prof Eng (MEng/MSc)
5 Years nominal

Entry from 2nd Level
(A-Level, Hons LC)

Uni’s, DIT, IoT’s ??

180 ECTS

Depth

120 ECTS

Breadth

Mobility Point
e.g., BEngSc

“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)

- See also Higher Education & Awards Council website (www.hetac.ie)
  - standards for engineering education:
  - http://www.hetac.ie/consultation_docs.cfm?sID=9