

The implications of Bologna for engineering: our experience at Imperial

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The importance of Bologna

- International context
 - Europe, 46 signatory countries
 - But many other countries watching with interest: e.g. Australia, SE Asia and, recently, North America
- UK student mobility and employment
- Ability of UK HEI to compete globally

- London Ministerial meeting and Communiqué – May 2007 *“We reaffirm our commitment to increasing the compatibility and comparability of our higher education systems, whilst at the same time respecting their diversity.”*

Quality assurance

- London Communiqué:
 - Register of approved national QA agencies
 - Very important for global value/esteem of EHEA
 - UK strength
 - Crucial for bachelors, masters and doctoral programmes

Credit system for transfer and accumulation

- London Communiqué: “proper implementation of ECTS based on learning outcomes and student workload”
 - NB:
 - Credit system is specified as ECTS, not ‘such as ECTS’ as in previous communiqués
 - inclusion of the word ‘proper’ and ‘based on learning outcomes’
- From the EU Lifelong Learning website
 - “ECTS is a student-centred system based on the student workload required to achieve the objectives of a programme, objectives preferably specified in terms of the learning outcomes and competences to be acquired”
- Appears to be little/no room for alternative credit systems (Burgess?)

Bologna features

- 3 cycles
 - Bachelors, Masters, Doctoral
- Credit system for transfer (student mobility) and accumulation
 - European Credit Transfer System (ECTS)
 - Focus intended to be on learning outcomes
 - Time served is unfortunately much easier to measure

Degree structures and credits: implications of ECTS

- Most of continental Europe: 3+2+3 years
- UK: 3+1+3 years
- ECTS, generally accepted/assumed
 - 25-30 hours/ECTS
 - 1 academic year (AY), 60 ECTS;
 - ?1 calendar year (CY), 75 ECTS
- But, considerable variability across Europe
- Bachelors: 180-240 ECTS
- Masters 90-180 ECTS (with a minimum of 60 ECTS at M level)

Degree structures and credits: potential problems

- UK 1-year (12 month) full-time masters
 - Is 75 ECTS the maximum possible?
- UK integrated (4 academic year) masters
 - Important for accreditation, but
 - Only 240 ECTS
- Considerations
 - Learning outcomes?
 - Compatibility?
 - Is change necessary?

Imperial's approach to becoming Bologna compatible

- Senate – Imperial's courses should be Bologna compatible
- Bologna Task Force
 - Pro Rector (PG & International Affairs); Chairs of Faculty Teaching Committees, Deputy Registrar, Strategy and Planning Officer
- Benchmarking against other European universities
 - IDEA League (Imperial, Delft, ETH Zurich, Aachen, Paris Tech)
 - Mutual recognition of degrees (IDEA)

Imperial's approach to becoming Bologna compatible

- Collection and analysis of detailed data
- Pilot, then modified and expanded to all bachelors and masters courses
- Spreadsheet plus comments
- 100% return
 - *Learning outcomes (assessed via biennial course review)*
 - Total study hours (taught and private)
 - ECTS then assessed
 - number of ECTS at M level (> than minimum required of 60/90)
 - Staff and student consultation
 - Confidence in data

Analysis of programmes at Imperial: Bachelors

- Bachelors
 - Not a problem
 - 25-30 hours/ECTS
 - 3 academic years at 60 ECTS/year; 180 ECTS *in toto*
 - 4 years with a year in Europe at 60 ECTS/year; 240 ECTS *in toto*

Analysis of programmes at Imperial: 12-month masters

- 12-month masters (81/87)
 - Highly intensive course (students warned at interview)
 - 12 months (48 week) duration; average of ~47 hours/week
 - 25-30 hours/ECTS
 - 90 ECTS *in toto* (majority, if not all, at M level)
 - Remaining 6 under modification for 2009/10 entry

Analysis of programmes at Imperial: Integrated masters

- MEng; MSci
- Currently 20/37 programmes follow 4 academic years
 - 240 ECTS (25-30 hours/ECTS)
- Some (17/37) already have substantial additional work outside the academic terms
 - 270 ECTS (25-30 hours/ECTS)
- All MEng and almost all MSci will be extended to give 270 ECTS for 2009/10 entry

Four models of masters courses at Imperial: 2007/08 onwards

- **Integrated masters**
 - 4 academic years; 240 ECTS
 - Very few
 - Subjects where for PhD a 12 month masters is preferred
 - 4 academic years plus additional work; 270 ECTS
 - ‘Extended’ integrated masters
 - Almost all integrated masters will follow this format
 - All MEng from 2009/10
- **Free-standing masters**
 - 12 months; 90 ECTS; standard format
 - 2 academic years; 120 ECTS; specifically for collaborative masters with non-UK universities

- *Review of the implications of Bologna compatibility for Engineering - by Faculty of Engineering*

Addressing Bologna: the view from Engineering at Imperial College London

- International
- Student mobility
- Ability to compete
- Support Senate decision – all courses to be Bologna compatible

Bologna Compatible

- General acceptance
- Basis is Learning Outcomes, but accept that, for the present the “currency” of comparisons is ECTS
- But avoid accounting rather than achievement

Imperial Engineering – course characteristics

- Recruit very able students
- Work them hard
- Ethos of high standards
- International participation and benchmarking e.g. IDEA league
- Confidence to defend our graduates

1-Year Specialised MSc

- Run for 12 months
- Working for full year
- High entry standards e.g. 1st class MEng
- High exit standards e.g. employability
- Key issue is the 75/90 ECTS in a calendar year

4-Year Integrated MEng

- ECTS exercise confirms content and level
- Also range and extent of “extra” items
- Identification of possible unrecognised/additional features
- Preparation – not prescription

Extra Curricular Engineering Extension Activities, e.g.

Activity	Time - weeks	ECTS	Mechanism	Learning outcomes	Reporting & Accountability	Resource implications
UROP	6 – 10 weeks	12 - 20	Student must apply to prospective academic supervisors. Faculty to provide some scholarships on a competitive basis	Gains experience of real 'engineering' research environment and work practices Develops CV, cold calling, interview presentation & Communication Skills	Supervisor certifies period of work on standard form. Student submits certificate and written report or reflective journal entry to Faculty/ Department	Funding of additional UROP scholarships
EWB (or equivalent external organisation overseas placement)	6 - 10	12 – 20	Student Must apply and gain placement from external providers	As above but adds an international perspective and development context	As above with the possibility that student must also present to peers	Organise presentation forum
Volunteer International Field Work through IC e.g. Civil Eng El-Salvador	19	20	Student application to Student Society/Department	As above	As above	Department to assist student society to organise and report back to peers. Department to sanction appropriate field work.

4-Year Integrated MEng

- ‘Extended’ 4-year integrated masters, MEng, 270 ECTS
- Academic decision; does not affect validity of 4-year (academic year) integrated masters for accreditation

Reflections

- Imperial “response” designed for Imperial
- Education not training
- Compatible not identical
- Learning outcomes not time served

Thank you