



Development of the Educational System for Geodetic Surveyors in Ireland

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3rd level programmes including Land Surveying modules

Institutes of Technology

- BSc in Geomatics
- Certificate, BE (Ord) & BE in Civil Engineering
- BSc in Building Surveying, Property Economics, Quantity Surveying
- BSc (Ord) in Architectural Technology, Auctioneering, Valuation & Estate Agency
- BTech in Construction Management

Universities

- BE in Civil Engineering



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Department of Spatial Information Sciences, DIT

Fulltime Programmes:

- BSc. Geomatics (240 ECTS) – since 1999
- MSc. Spatial Information Management (90 ECTS) – Jan 2007

Continuing Professional Development (CPD):

- Geographic Information Systems (evening course – 60 hours)
- Tailor made courses – Dublin City Council, OSI, An Garda, etc
- eLearning
 - Coordinate Reference Systems (5 ECTS)
 - GNSS (in preparation)

Research

- MPhil. research projects (2 years)
 - Two projects - already completed (2004, 2006)
 - Three projects - Funding available and ready to start
- PhD research scholarship – one project applied for



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Historical Perspective

Geodetic Surveying Programmes	Duration	ECTS	Graduates
Diploma in Geo-Surveying	1972 - 1977	240	24
Certificate in Geo-Surveying *	1977 - 2002	120	104
Diploma in Geo-Surveying *	1979 - 2002	180	368
BSc. in Geomatics	2003 - 2006	240	94

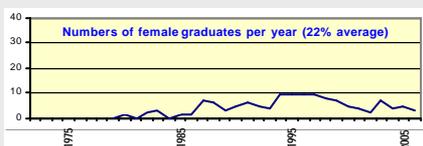
- * Certificate and Diploma Programmes in Geo-Surveying ran in tandem
- Students graduated after 2 years with a certificate and those with an overall merit grade (>60% average) completed a third year to graduate with a Diploma
- 22% did not progress from Certificate to Diploma



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Historical Perspective



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Reasons for Upgrading Diploma to BSc



- Educational Profile of the Future to encompass three areas



Enemark, 2001

- Length of courses must reflect need for developing both professional and academic skills
- 4 year programme as 'minimum' and 5 year programme 'recommended' to give broad, high level knowledge

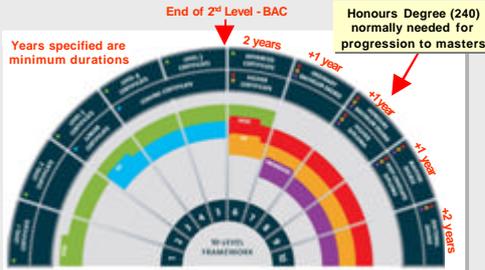


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Reasons for Upgrading Diploma to BSc

National Qualification Authority of Ireland - 10 Level Framework



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Reasons for Adopting the 4 Year BSc Model

	Honours Degrees 240 ECTS	Ordinary Degrees 180 ECTS	Percentage using 4 year model
Higher Education Authority (HEA) (Universities)	13,359	2720	83%
Dublin Institute of Technology *	1156	173	87%
Higher Education & Training Awards Council (HETAC)			
Other Institutes of Technology	4510	990	82%

* Figures for DIT relate to 2001 graduates and ordinary degrees are estimated

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Rationale for Upgrading Diploma to BSc.

- Perception by graduates that 3 year Diploma qualification was hindering their career progression
- Supplying needs of graduates - many going to UK for one year top up from Diploma to BSc.
- Adoption of 4 + 1 Bologna model in preference to 3 + 2 model is the norm in Ireland
- Wished to provide graduates with option to progress to MSc in order to not disadvantage them in Europe
- Adopted European model for course content instead of Anglo model - good vision for the future
- Leadership - limited interest by surveying businesses

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BSc. Geomatics (1999 – 2005)

	Semester 1	Semester 2
Year 1	Analogue Surveying Methods	Analogue & Introduction to Digital Surveying Methods
Year 2	Digital Surveying Methods	Digital Surveying Methods
Year 3	Spatial Data Acquisition & Processing	Spatial Data Acquisition & Processing
Year 4	3 Streams – European Model	Undergraduate Dissertation

Delivery: Fulltime – 24 to 27 contact hours per week
Accreditation: IIS, SCS & ICES

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BSc. Geomatics

- 3 streams proposed for semester 7 in Measurement Science, Spatial Information Management & Land Management
 - Limited resources in Department to provide 3 streams
 - Student numbers per stream - economic viability?
 - In hindsight specialisation might be better at masters level
- 3 streams in year 4 replaced with core modules in:
 - Remote sensing
 - Geodetic surveying
 - GIS
 - Land management
 - Professional development (project management & law)

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Quality Assurance and Quality Management

- Programme Review - every 5 years
 - Validation - two external examiners (1 industrial & 1 academic)
 - Accreditation - professional bodies
- Assessment Review - annually
 - Two external examiners (1 industrial & 1 academic)
- Adoption of improved teaching & learning methodologies
 - Problem Based Learning
 - eLearning & WebCT

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BSc. Geomatics - (2006 - 2010)

	Semester 1	Semester 2
Year 1	Overview & Fundamental Surveying Techniques	Analogue & Digital Surveying Techniques
Year 2	Spatial Data Acquisition & Processing	Spatial Data Processing & Management
Year 3	Industrial Work Placement	Application of Spatial Information
Year 4	Undergraduate Dissertation	Business Cases

Delivery: Fulltime - 25 to 30 contact hours per week
Validation: February 2006
Accreditation: IIS, SCS & ICES to complete in autumn 2006

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BSc. Geomatics - (2006 - 2010)

- **Joint modules with BSc. Spatial Planning & BSc. Environmental Management in semester 1**
 - Geo-Spatial Awareness, Sustainable Development & Introduction to Geomatics
 - Introduces students to broad scope of Geodetic Surveying, Environmental Management and Spatial Planning early on
- **Industrial work placement - 3 options:**
 - Work experience for 12 weeks + written report
 - Study at another university in Europe under ERASMUS
 - Research a topic in DIT + written report
- **Semester 7 - complete undergraduate dissertation and light lecture load**

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BSc. Geomatics - Programme Entry Method

- Third level places offered by competition using results from Leaving Cert (BAC) – score from 6 best subjects, max = 600
- Students nominate programme preference to CAO
 - high demand requires high score
 - Limitation of places can also increase demand artificially
- Geomatics offers 35 to 40 places annually - limitation stems mainly from limited equipment resources
CAO 'first round' first preference for Geomatics

1999	2000	2001	2002	2003	2004	2005	2006
94	63	73	54	37	31	35	43
- Numbers augmented by mature & advanced entry

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BSc. Geomatics - Marketing Initiatives



- Published flyer in Dec 2004 to assist career guidance teachers
- Evaluation survey of 1st years in Sept 2005 to improve visibility to search engines and keywords
- New initiative planned – currently conducting feasibility study on hosting a Community Mapping Competition for School Children

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MSc. Development Philosophy



- Moving towards equality of qualifications with Europe
- Small pool of existing geodetic surveyors so also need to draw from other professions - engineers, geographers, information technology
- Current potential for taught MSc. Spatial Information Management - large growth in this area at present
- Future potential possible in Remote Sensing & Cadastral areas

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Irish Post Graduate Courses for Geodetic Surveyors

Academy	Location	Course Title	Post Graduate Diploma		MSc	
			Fulltime	Part-time	Fulltime	Part-time
University of Ulster	Coleraine	GIS	9 Months	24 Months	3 Months	12 Months
NUI Maynooth	Maynooth	Applied RS & GIS	12 months		6 months	
NUI Cork	Cork	Applied GIS & RS	12 months		12 months	
DIT	Dublin	Spatial Information Management				27 Months

- All programmes award an MSc. (90 ECTS)
- Multiple delivery modes available

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MSc. Spatial Information Management

Year	Semester 1	Semester 2
1	GPS & Coord Reference Systems Geographic Information Science Project Management	Remote Sensing Technologies Spatial Analysis & Visualisation GI Quality, Update and Upgrade
2	Information Architecture Spatial Databases Case Studies in GI Applications	Organisational GI Mgt Strategies E-Government & Information Society Spatial Data Infrastructures
3	Postgraduate Thesis	

Language: English
NQAI Level 9: 90 ECTS
Delivery: Part-time – one day per week
Fees (pa): €3,200 (EU), €10,000 (non-EU)



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Concerns of Survey Company Owners / Managers

- **BSc in Geomatics**
 - Producing the chiefs, but what about the Indians?
 - Need for lower level programme also - part time certificate (NQAI level 6) - apprenticeship in collaboration with survey companies - work experience + 1-2 days per week over 3 years?
 - Graduates have competition from Surveyors from Central Europe (technically good & have good work ethic)- Survey in 2007 to identify where graduates are employed - impression that few are ending up in small surveying firms
- **MSc. Spatial Information Management**
 - Initial interest good & not limited to geodetic surveyors
 - Validation successful June '06 – start January '07?



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Conclusions

- **Broad high level education is the way forward - even if some sections of surveying sector do not think so**
 - Must give skills for 40 year career - learning to learn - technology changing so rapidly that initial qualification not good enough - CPD is essential
 - Projects managed by multi-disciplined teams - geodetic surveyors need parity of qualifications to participate on equal footing
- **BSc. permits entry to MSc. and PhD to carry out much needed research in three main areas**
 - Measurement Science
 - Spatial Information Management
 - Land Management



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