

# GEOSPATIAL EDUCATION TO EMPOWER BUSINESS QUALITY



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GOOD UNIVERSITIES GUIDES  
Australia's  
University of the Year  
2000 - 2001  
DEVELOPING THE e-UNIVERSITY



*We hear .....*

*“The next few years will encompass the significant impact of broadband, wireless, smart cars, smart fridges, streaming media, voice recognition and the inevitable growth of new Internet applications. In the present context, change is the only constant!”*

*... we are part of this change and ...*

**Suitable graduates are needed to capitalise on these changes.**

*The University of Southern Queensland  
is not a traditional university!*

- **Choose on-campus, off-campus, on-line web study ...  
or any combination**
- **Choose the study program level – choose to change to  
higher or lower levels**

# Background

1967 - USQ established.

1998 - Faculty of Engineering and Surveying  
ISO9001:1994 quality certification.  
**(In 2003 - ISO9001:2000)**

1999 - Best dual-mode university in the  
world - International Council for  
Open and Distance Learning (ICDE)

2000 - joint winner *Australian University  
of the Year 2000-2001*



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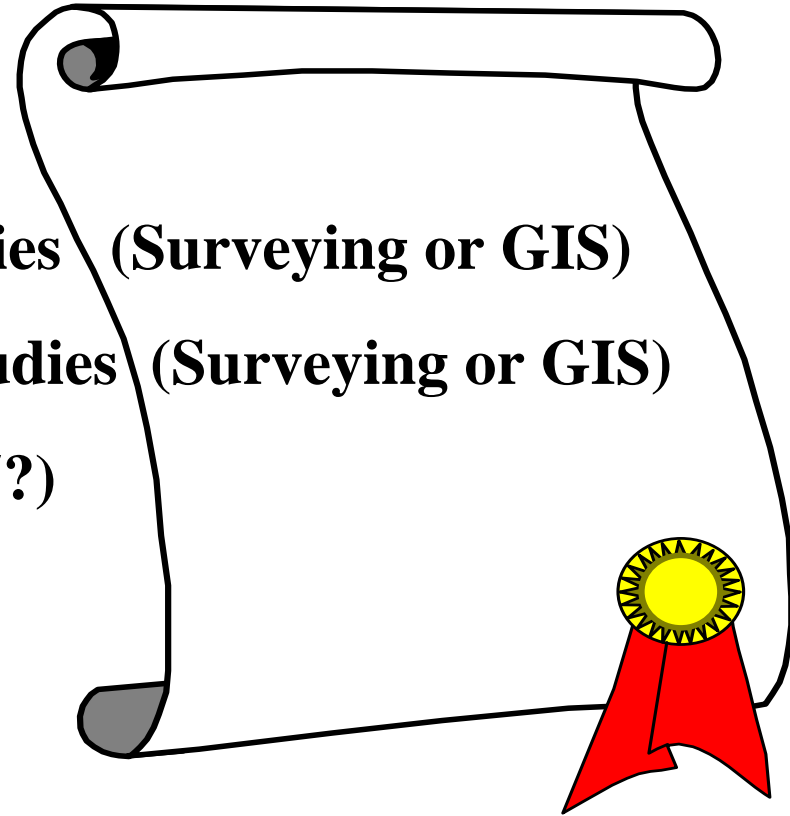


**EDUCATION**  
**to**  
**EMPOWER BUSINESS QUALITY**  
**from**

- **User-defined technical, professional and CPD education opportunities**
- **Flexible delivery and multiple options.**

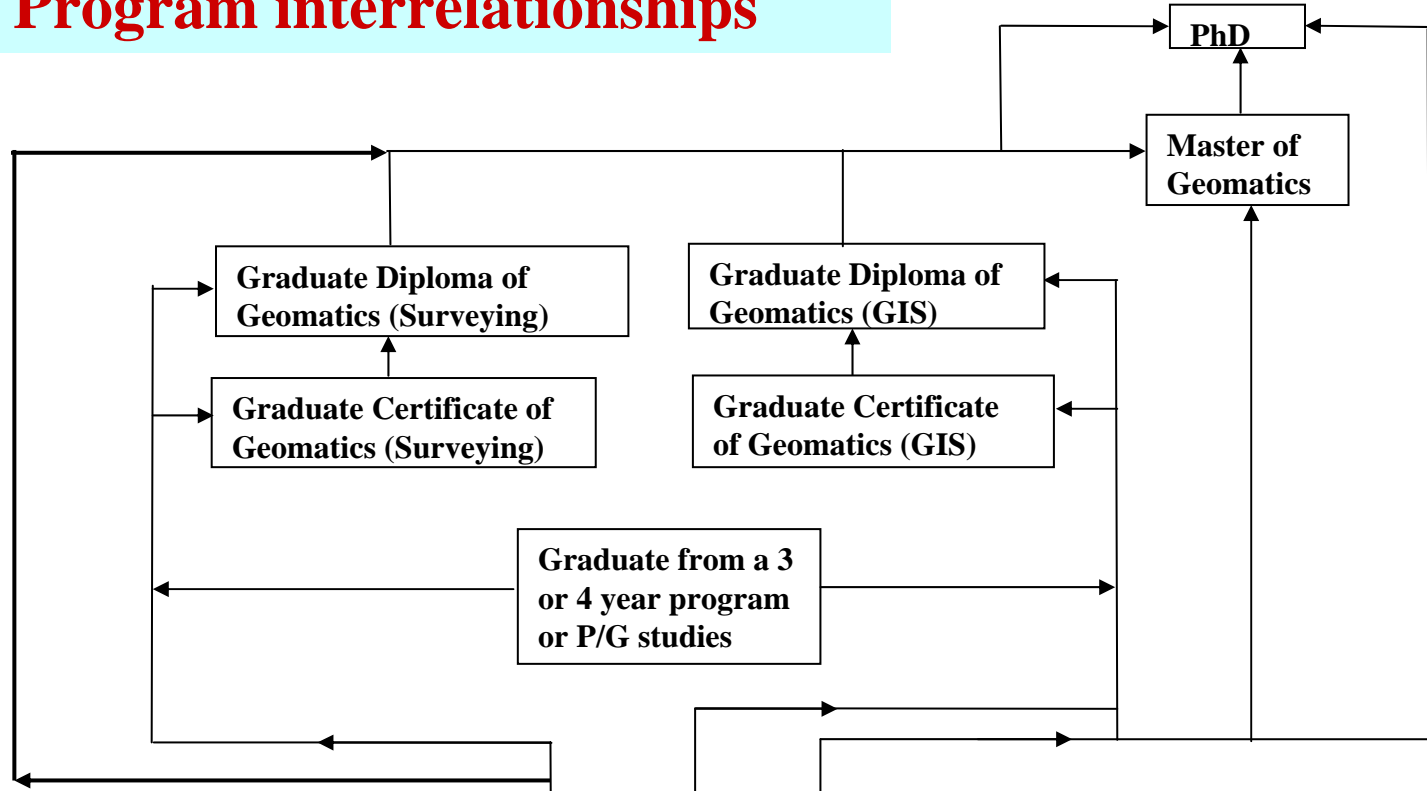
# PROFESSIONAL EDUCATION AND CPD OPPORTUNITIES

- **Doctor of Philosophy**
- **Master of Geomatics**
- **Graduate Diploma in Geomatic Studies (Surveying or GIS)**
- **Graduate Certificate in Geomatic Studies (Surveying or GIS)**
- **Bachelor of Surveying (and GIS 2005?)**
- **Bachelor of Technology (Surveying)**
- **Bachelor of Technology (GIS)**
- **Associate Degree (Surveying)**
- **Associate Degree (GIS)**

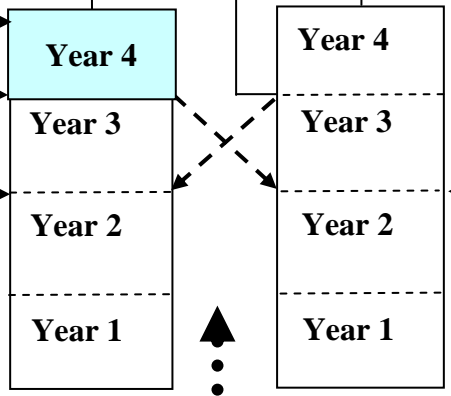


**... plus single courses, workshops, short courses, etc.**

# 2005? Program interrelationships



**Bachelor of Spatial Science (GIS)**  
**Bachelor of Spatial Science Tech. (GIS)**  
**Associate Degree in Spatial Science (GIS)**



**Bachelor of Spatial Science (SVY)**  
**Bachelor of Spatial Science Technology (SVY)**  
**Associate Degree in Spatial Science (SVY)**

**Cross Institutional studies**  
**Short courses, 'special' courses**  
**Single courses for credit**

**Credit transfers – studies from other institutions.**

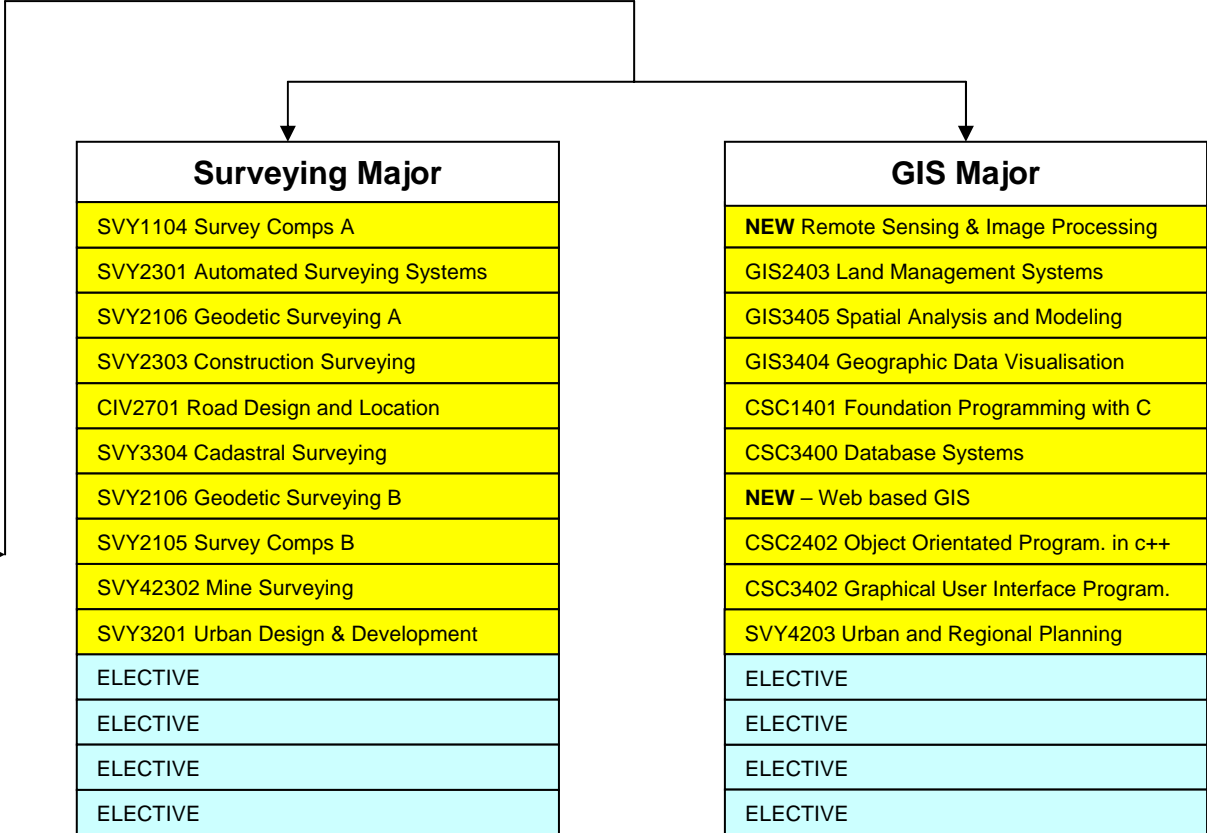
# Bachelor of Spatial Science (2005?)

## LEGEND

C  
O  
R  
E

MAT1100 Foundation Mathematicss
SVY1102 Surveying A
GIS1401 Geographic Data Presentation
ENG1101 Engineering Problem Solving 1
ENG2102 Engineering Problem Solving 2
ENG1001 Princ. of Prof Eng and Surveying
GIS1402 Introduction to GIS
ENV2201 Land Studies
<b>NEW</b> Introduction to GPS
ENG2002 Technology and Society
SVY3202 Photo and Remote Sensing
CIS1001 Intro to Business Programming
MAT1102 Algebra and Calculus 1
ENG411 Research Project Part 1
ENG4112 Research Project Part 2
ACC1101 Accounting for Decision Making
SVY4308 Prof Ops and Proj Mngt
SVY4306 Land Law & Valuation

<b>COMMON COURSES - ASSOCIATE DEGREE</b>
<b>COMMON COURSES – BACHELOR OF TECHNOLOGY</b>
<b>COMMON COURSES - BACHELOR DEGREE</b>
<b>BACHELOR DEGREE COURSES</b>
<b>ELECTIVES</b>



Surveying Major
SVY1104 Survey Comps A
SVY2301 Automated Surveying Systems
SVY2106 Geodetic Surveying A
SVY2303 Construction Surveying
CIV2701 Road Design and Location
SVY3304 Cadastral Surveying
SVY2106 Geodetic Surveying B
SVY2105 Survey Comps B
SVY42302 Mine Surveying
SVY3201 Urban Design & Development
ELECTIVE
ELECTIVE
ELECTIVE
ELECTIVE

GIS Major
<b>NEW</b> Remote Sensing & Image Processing
GIS2403 Land Management Systems
GIS3405 Spatial Analysis and Modeling
GIS3404 Geographic Data Visualisation
CSC1401 Foundation Programming with C
CSC3400 Database Systems
<b>NEW</b> – Web based GIS
CSC2402 Object Orientated Program. in c++
CSC3402 Graphical User Interface Program.
SVY4203 Urban and Regional Planning
ELECTIVE
ELECTIVE
ELECTIVE
ELECTIVE



COURSE	BSS (SVY)	BTSS (SVY)	ADSS (SVY)	BSS (GIS)	BTSS (GIS)	ADSS (GIS)
MATI100 Foundation Mathematics						
SVY1102 Surveying A						
GIS1401 Geographic Data Presentation						
SVY1110 Introduction to GPS						
ENG1101 Problem Solving 1						
ENG1001 Principles of Prof. Engineering and						
ENG2102 Problem Solving 2						
SVY1104 Survey Computations A						
SVY2301 Automated Surveying Systems						
MATI102 Algebra and Calculus I						
SVY2302 Mine Surveying						
ACC1101 Accounting for Decision-Making						
CIV2701 Road Design and Location						
SVY2106 Geodetic Surveying A						
SVY2105 Survey Computations B						
SVY2303 Construction Surveying						
SVY3304 Cadastral Surveying						
CSC1401 Programming in C						
SVY4306 Land Law and Valuation						
SVY3107 Geodetic Surveying B						
SVY3202 Photogrammetry & Mapping						
GIS1402 Geographic Information Systems						
SVY4203 Urban and Regional Planning						
GIS2403 Land Management Systems						
ENV2201 Land Studies						
ENG2002 Technology and Society						
SVY3201 Urban Design and Development						
GIS3406 Remote Sensing and Image Processing						
SVY4309 Practice Management for Spatial Scientists						
ENG4111 Research Project Part 1						
ENG4112 Research Project Part 2						
**** Elective						
**** Elective						
**** Elective						
**** Elective						
GIS4407 Web Based GIS						
CSC2402 Object Oriented Programming in C++						
CSC3402 Graphical User Interface Programming						
GIS3405 Spatial Analysis and Modelling						
CSC3400 Data Base Systems						
GIS3404 Geographic Data Visualisation						
CIS1001 Introduction to Business Programming						
SVY1901 Surveying Practice 1						
GIS2901 GIS Practice 1						
SVY2902 Surveying Practice 2						
GIS3901 GIS Practice 2						
SVY2903 Surveying Practice 3						
SVY3904 Surveying Practice 4						

# Course correlation with study programs

Academic courses

Practical courses

# What do professionals need ..... or need to develop in ?

- **Communication skills;**
- **Conceptual, innovative and lateral thinking;**
- **Judgement, analysis, critical evaluation and spatial connectivity ability.**
- **An ability to adopt and adapt – be proactive;**
- **Technology knowledge;**
- **Contextual understanding of their work environments;**
- **Relate to society and government thinking;**
- **Administrative, management and human relations abilities;**
- **Synthesis knowledge for solving problems;**
- **A professional attitude; and**
- **A lifetime learning ability.**

## **Study approaches (for supporting business flexibility) include:**

- **Free movement between the surveying and GIS programs.**
- **Choose degree level - move up or down.**
- **Cross institutional choice (limited) of courses.**
- **Complete single courses for credit.**
- **Short courses and workshops available on an on-demand basis.**
- **Special arrangements - developed for individual situations, eg.**
  - ✓ **A five-day on-campus technical training period.**
  - ✓ **A five-month technical/theoretical/projects program.**
  - ✓ **Off-campus short courses.**

# Basic program structure concepts:

## First-year courses –

- **Assimilate students into the profession and its role.**
- **Basic technical competence and knowledge.**

## Second-year courses

- **Higher technical competence and applications knowledge.**
- **Ability to lead a small field party.**

## Third-year courses

- **Higher technical competence and understanding**
- **Higher ‘academic’ application knowledge and management elements.**

## Fourth-year courses –

- **Professional management, professionalism, project research and reporting ability and higher ‘academic’ preparation.**

# Resulting graduate attributes....

## Personal

- **function effectively as an individual and in multi-disciplinary team as a leader or manager;**
- **manage under time and resource constraints;**
- **adapt to changes and to master new techniques technology;**
- **independently undertake lifelong learning**

# Academic

- **Apply scientific, computing and maths techniques;**
- **Gather, discriminate & use information sources;**
- **communicate effectively;**
- **apply problem solving techniques - identification, analysis, evaluation and synthesis; decision making; and initiative, innovation and creativity;**
- **systems approach to design and operational performance;**
- **need for sustainable design and development;**

## **Professional**

- **understand social, cultural, economic, and environmental responsibilities;**
- **understanding professional, legal and ethical responsibilities professional.**

## Year 1 example *Problem Solving* courses –.

For real life experience, basic knowledge is learnt/experienced in context (in a team environment):

- **Planning, organising, managing** (group and personal).
- **Written, verbal and visual communication.**
- **Mathematics and physics** contextual application.
- **Teamwork** and individual contribution.
- **Study and research techniques.**
- **Role** within own profession, other professions and society.

**.... we then build on these abilities.**



# Future Developments

- Development of a selected number of **on-line** courses ;
- Development of Computer Assisted Learning (**CAL**);
- Use more **application software** (GIS, GPS, 3D modelling, etc);
- Improve **communication** and **web access**;
- Improve **flexible** and **generic materials** - XML technology;
- **PDF file use** with fully functioning Internet links;
- Improve **web interface** to provide greater flexibility; and
- **Twinning arrangements** with other institutions.

**Linking with Business & professional  
organisations.**

**User defined  
paraprofessional and professional geospatial education  
is  
highly desirable and  
is  
available.**

**Anywhere - Anytime – Anyway - Any Level**

**USQ's flexible and contemporary geospatial education curricula addresses those technical, professional, research and innovative learning experience needed to empower the spatial sciences industry's future.**

**Questions !!**