Bachelor of Urban Development (Spatial Science) (UD40)

**Year offered:** 2010  
**Admissions:** Yes  
**CRICOS code:** 056387B  
**Course duration (full-time):** 4 years  
**Domestic fees (indicative):** 2010: CSP $3,700 (indicative) per semester  
**International Fees (indicative):** 2010: $10,750 (indicative) per semester  
**Domestic Entry:** February  
**International Entry:** February  
**QTAC code:** 412532  
**Past rank cut-off:** 77  
**Past OP cut-off:** 12  
**OP Guarantee:** Yes  
**Assumed knowledge:** English (4, SA) and Maths B (4, SA)  
**Preparatory studies:** For information on acquiring assumed knowledge visit  
**Total credit points:** 384  
**Standard credit points per full-time semester:** 48  
**Course coordinator:** Dr John Hayes  
**Discipline coordinator:** Mr Robert Webb  
**Campus:** Gardens Point

**Why choose this course?**  
The QUT course is broad-based and balanced and taught by staff with professional backgrounds.  

**Career Outcomes**  
There is a high demand for QUT Spatial Science (Surveying) graduates both in Australia and overseas. The employment rate has been near 100% for many years and is not expected to change in the near future. Surveyors and spatial professionals assess geographic and land information for implementing appropriate administration for the land, sea and related structures. Spatial information refers to information about the geographical relationship between places, people and other items within a particular area. There are employment opportunities in all levels of government, private practice and multi-national companies, statutory authorities or semi-government agencies. You will have the opportunity to travel as the degree is readily accepted overseas. After some years of experience you may become a manager or specialise as one of the following: Spatial Information Officer; Cadastral/Land Surveyor; Engineering Surveyor; Mine Surveyor; Remote Sensing Specialist; Topographic Surveyor; Cartographer (mapping).

**Practical teaching**  
You will regularly be involved in practical activities such as field trips and are required to undertake work experience as part of your degree.

**Industry links**  
The QUT staff are highly regarded professionally and maintain their links with industry by working closely with the professional bodies.

**Facilities / technology**  
You will work in first-class laboratories, studying surveying instrumentation and mapping science.

**Convenience**  
You will study at QUT’s Gardens Point campus in the centre of Brisbane, within easy walking distance to public transport, including buses, trains and ferries.

**Who should do this course?**  
If you are interested in any of the following you may enjoy a career in Spatial Science (Surveying):  
- Mathematics  
- Working in a variety of environments.  
- Geography
Professional Recognition
The course is recognised by Queensland Surveyors Board and the Surveying and Spatial Science Institute of Australia (SSSI).

Special Course Requirements
You will be required to attend compulsory field practicals off-campus in the Moreton Region and have access to an advanced scientific calculator for use during the course. To graduate you are required to have at least 90 days of approved industrial experience/practice in a spatial science/surveying environment.

Minors
For professional recognition you will undertake two minors (a minor is four units or 48 credit points in the same discipline) the first is a Science minor which includes Maths and the second an Applications minor which consists of a Work Integrated Learning unit, a project unit and two specialised spatial science units.

International Student Entry
International students must maintain an enrolment program that will allow them to complete their course within the specified timeframe of their eCoE (electronic Confirmation of Enrolment).

Deferment
QUT allows current Year 12 school leavers to defer their undergraduate admission offer for one year, or for six months if offered mid-year admission, except in courses using specific admission requirements such as questionnaires, folios, auditions, prior study or work experience.

Non-year 12 students may also request to defer their QTAC offer on the basis of demonstrated special circumstances.

Find out more on deferment.

Further Information
School of Urban Development - Phone +61 7 3138 2678, Fax +61 7 3138 1515, email: bee.enquiries@qut.com

Full-time Course Structure - Commencing February 2010 onwards

Year 1 - Semester 1
UDB100 Introducing Professional Learning
MAB120 Algebra and Calculus
UDB101 Stewardship of Land

UDB181 Geospatial Positioning and GPS

Year 1 - Semester 2
UDB200 Introducing Sustainability
MAB101 Statistical Data Analysis 1
UDB104 Urban Development Economics
UDB182 Surveying

Year 2 - Semester 1
PCB172 Physics for Surveyors
UDB281 Geographic Information Systems
UDB283 Surveying Computations
UDB285 Cadastral Surveying

MAB730 Surveying Mathematics 2
UDB102 Applied Law
UDB282 Remote Sensing
UDB284 Engineering Surveying

Year 2 - Semester 2
UDB381 Geospatial Mapping
UDB383 Control Surveying and Analysis
UDB385 Cadastral and Land Management
UDB387 Spatial and Land Information Management

Year 3 - Semester 1
UDB302 Development Process
UDB382 Photogrammetric Mapping
UDB384 Geodesy
UDB388 Spatial Analysis Practice

UDB381 Geospatial Mapping
UDB383 Control Surveying and Analysis
UDB385 Cadastral and Land Management
UDB387 Spatial and Land Information Management

Year 3 - Semester 2
UDB302 Development Process
UDB382 Photogrammetric Mapping
UDB384 Geodesy
UDB388 Spatial Analysis Practice

Year 4 - Semester 1
BEB701 Work Integrated Learning 1
UDB301 Research Methods
UDB483 Global Positioning Principles and Practice
UDB485 Property Development Practice

Year 4 - Semester 2
BEB801 Project 1
UDB202 Business Skills
UDB484 Topographic, Hydrographic and Mining Surveying
UDB486 Cadastral Practice
Potential Careers:
Mapping Scientist/Photogrammetrist, Spatial Information Officer, Surveyor.

UNIT SYNOPSIS

BE8701 WORK INTEGRATED LEARNING 1
This unit aims to provide you with the opportunity to learn in a workplace environment. It will involve attendance, participation, observation, critical reflection, and report writing on workplace activities. The emphasis of your critical reflection and report writing will be on identifying and describing aspects of professional relevance incorporating: collaboration and teamwork; work place, health and safety; professional conduct; ethical responsibility, and other aspects of your work place experience. This unit may form part of your (compulsory) course core (as required by professional accrediting bodies e.g. Engineers Australia, Australian Institute of Building, Royal Institution of Chartered Surveyors), or it may be one of several work integrated learning (WIL) units (selected as part of a Minor).
Prerequisites: 192cp of completed studies
Credit points: 12    Campus: Gardens Point    Teaching period: 2010 SEM-1, 2010 SEM-2 and 2010 SUM

BE8801 PROJECT 1
This unit is usually taken in the final year of study. Students complete an individual project involving the application of skills and knowledge attained during the earlier years of their degree program. For some students, this unit will be taken one of two ‘project’ units related to the same student project; in such cases this unit may be a pre-requisite or co-requisite to the second unit (or a follow-on from the first unit). The final ‘deliverable’ for this unit may vary for each discipline and details will be provided in lectures/tutorials and on the Blackboard website.
Equivalents: CEB411, CEB420, CNB434, EEB781-1, EEB889-1
Credit points: 12    Contact hours: 2 per week    Campus: Gardens Point    Teaching period: 2010 SEM-1 and 2010 SEM-2

MAB101 STATISTICAL DATA ANALYSIS 1
Experiments, observational studies, sampling, and polls; data and variables; framework for describing and manipulating probability; independence; Binomial and Normal distributions; population parameters and sample statistics; concepts of estimation and inference; standard error; confidence intervals for means and proportions; tests of hypotheses on means and proportions (one sample and two independent samples); inference using tables of counts; modelling relationships using regression analysis; model diagnosis; use of statistical software.

MAB120 ALGEBRA AND CALCULUS
This unit introduces and reviews the elementary concepts of function, calculus, matrices and vectors with special reference to applications in science, technology and business where appropriate. Topics covered include the algebra of complex numbers, elementary functions (polynomial, trigonometric, exponential and logarithmic) and their properties, differentiation and integration methods and principles, geometric and algebraic applications of vectors and the solution of linear systems using matrices.
Assumed knowledge: Grade of at least Sound Achievement in Senior Mathematics B (or equivalent) or MAB105 is assumed knowledge
Equivalents: MAB100, MAB125, MAB180
Credit points: 12    Contact hours: 4 per week    Campus: Gardens Point    Teaching period: 2010 SEM-1, 2010 SEM-2 and 2010 SUM

MAB730 SURVEYING MATHEMATICS 2
This unit includes: systems of linear equations; Gaussian elimination; matrix inversion, properties of inverses; partial pivoting; error propagation; determinants; properties of determinants; rank; compact (direct) and iterative (indirect) methods for solving linear systems; Eigenvalues of 2x2 and 3x3 matrices; diagonalisation; quadratic forms; conic sections; Lagrange interpolation; divided differences; cubic splines; least squares methods; two-dimensional interpolation methods; fixed-point iteration, Newton’s method and Quasi-Newton methods.
Prerequisites: MAB100 or MAB120 or MAB125
Antirequisites: MAB220
Credit points: 12    Contact hours: 4 per week    Campus: Gardens Point    Teaching period: 2010 SEM-2

PCB172 PHYSICS FOR SURVEYORS
This unit includes the following: measurement and uncertainty kinematics (vector and scalar quantities, equations of motion); dynamics (friction, centripetal force, impulse and momentum, periodic motion, work and energy); gravity circular motion, centripetal force, gravity, Kepler’s Laws, orbits); fluid statics (pressure, barometry); fluid dynamics (fluid flow in pipes and channels, equation of continuity, Bernoulli’s principle); optical instruments (reflection, refraction, total internal reflection, spherical mirrors, thin lenses, transits, theodolites, corner cubes, cameras); electric and magnetic fields; electrical circuits (electronic components).
Credit points: 12    Contact hours: 4 per week    Campus: Gardens Point
Gardens Point  Teaching period: 2010 SEM-1

**UDB100 INTRODUCING PROFESSIONAL LEARNING**
This unit will introduce students to a range of skills and knowledge sets required to support professional practice in urban development disciplines. It will include information literacy and communication skills and knowledge development. In addition, the unit will provide orientation to urban development professions through an introduction to their history, their place in society, the importance of ethical conduct to their practice and to the particular qualities of professional knowledge especially with regard to practice knowledge. The importance of integrated scholarship and collaborative links with other professions will be highlighted.

**Equivalents:** BEB100  **Credit points:** 12  **Campus:** Gardens Point  **Teaching period:** 2010 SEM-1

**UDB101 STEWARDSHIP OF LAND**
This interdisciplinary unit will introduce students to the characteristics of land and land tenure with a focus on land use and property rights. The particular issues of native title, land contamination, heritage and alternative utility will be covered. Thereafter the property development process will be described in general terms and emphasis placed on the impact of environmental and social factors on the financial evaluation. The final component will cover the management of land, both urban and regional. Case studies will demonstrate the part that each discipline plays in the stewardship of land and its development.

**Equivalents:** CNB105  **Credit points:** 12  **Contact hours:** 3 per week  **Campus:** Gardens Point  **Teaching period:** 2010 SEM-1

**UDB102 APPLIED LAW**
Introduces the fundamental principles and practices of Australian governance as they affect the built environment professions. The relevance of government policies, laws and regulations and aspects of Tort, Contract and Land and Environmental laws applicable to the Development and Construction processes are examined in context.

**Credit points:** 12  **Contact hours:** 3 per week  **Campus:** Gardens Point  **Teaching period:** 2010 SEM-2

**UDB104 URBAN DEVELOPMENT ECONOMICS**
This unit will introduce microeconomic and macroeconomics concepts applied to urban and regional development. The unit will initially focus on demand, supply and determination of prices, and other important microeconomic concepts, at the level of an individual development. Here, the value of microeconomics in explaining aspects of development is demonstrated using local and national examples. In doing so, this unit will also help to deepen the appreciation of the key steps in development and the role of the main actors. Since anyone development project does not occur in a vacuum, the unit will then broaden to consider the impact of changes in the national and local economy on land use and development, including business cycle, monetary and fiscal policy.

**Credit points:** 12  **Contact hours:** 4 per week  **Campus:** Gardens Point  **Teaching period:** 2010 SEM-2

**UDB181 GEOSPATIAL POSITIONING AND GPS**
This unit will introduce students to skills and knowledge of spatial referencing, site measurement; use of maps and air photos. It will include introduction to map projections; concepts and theory of Global Positioning Systems; introduction to global and local coordinate systems; mission planning and data collection. The unit will highlight the importance of geospatial positioning applications in society.

**Credit points:** 12  **Contact hours:** 3 per week  **Campus:** Gardens Point  **Teaching period:** 2010 SEM-1

**UDB182 SURVEYING**
This unit provides a foundation in field instrumentation and survey computations; a framework for acquisition of a high level of knowledge and practical competence in plane survey computations: use of optical and electronic theodolites; EDM and total electronic station systems, and a focus on collection/preparation of pre-design contour and detail spatial information.

**Equivalents:** PSB640  **Credit points:** 12  **Contact hours:** 5 per week  **Campus:** Gardens Point  **Teaching period:** 2010 SEM-2

**UDB200 INTRODUCING SUSTAINABILITY**
This unit will enable you as a graduating Built Environment and Engineering professional to take active and positive steps to transform professional practice in ways that promote the sustainability of our planet, our economy and our society. As future professionals in the fields of Design, Urban Development and Engineering Systems, you will need to understand and apply the concepts of sustainability in your professional practice if we are to achieve sustainable development in the 21st Century.

**Credit points:** 12  **Campus:** Gardens Point

**UDB202 BUSINESS SKILLS**
This unit focuses on career preparation with a business orientation. Current popular business tools are assembled and critiqued. A sequential approach is used starting with characteristics of the Resume, business protocol and ethics, the business plan, assessing business risk and Professional Liability.

**Equivalents:** CNB228  **Credit points:** 12  **Contact hours:** 3 per week  **Campus:** Gardens Point  **Teaching period:** 2010 SEM-2

**UDB281 GEOGRAPHIC INFORMATION SYSTEMS**
This unit investigates the basic concepts of geographic information systems. Topics to be covered include...
components of GIS, spatial databases, data acquisition, reference frameworks, use of photographs and images, spatial analysis and graphic output design issues. The unit will highlight the importance of geographic information systems the unit will highlight the importance of geospatial positioning applications in society.

**Equivalents:** PSB631  **Credit points:** 12  **Contact hours:** 4 per week  **Campus:** Gardens Point  **Teaching period:** 2010 SEM-1

**UDB282 REMOTE SENSING**
This unit includes the following: history and principals of remote sensing; types of imagery, image interpretation, satellite systems; supervised and unsupervised image classification; interpretation, analysis and presentation of data; applications in the earth sciences.

**Equivalents:** PSB655  **Credit points:** 12  **Contact hours:** 4 per week  **Campus:** Gardens Point  **Teaching period:** 2010 SEM-2

**UDB283 SURVEYING COMPUTATIONS**
This unit includes the use of advanced scientific calculators and their application for geometric computations, solution of road and area problems, missing data closes, and simple curve problems. It offers solutions for more difficult problems including the three point problem, interrupted bases and various types of curve problems. It introduces spherical trigonometry, the solution of spherical triangles and the use of spherical trigonometry to determine position and direction on the Earth’s surface from observation to astronomical objects. Practical exercises determine position and direction.

**Prerequisites:** (MAB100 or MAB120) and UDB182  **Equivalents:** DBB646  **Credit points:** 12  **Contact hours:** 4 per week  **Campus:** Gardens Point  **Teaching period:** 2010 SEM-1

**UDB284 ENGINEERING SURVEYING**
This unit includes: horizontal and vertical alignment for route surveys; areas, volumes and earthworks; surveying measurements and their assessment; propagation of variances; pre-analysis of survey tasks; least squares adjustment methods for various functional and stochastic models.

**Prerequisites:** MAB101, UDB182, and UDB283  **Equivalents:** PSB641  **Credit points:** 12  **Contact hours:** 5 per week  **Campus:** Gardens Point  **Teaching period:** 2010 SEM-2

**UDB285 CADASTRAL SURVEYING**
This unit includes land title systems, reinstatement: an explanation of the options of land title systems, with particular reference to Customary Land Tenure, Private Deeds registration, Public Deeds Registration, and Registration of Title. It includes an analysis of reinstatement of property boundaries as applicable to Queensland; the undertaking of a field survey to reinstate the boundaries of a section in the Brisbane Metropolitan area; preparation of cadastral and detail survey plans for survey actions; the legal aspects of re-instatement of boundaries; case law associated with re-instatement; statutory requirements that relate to the zoning and development of land.

**Prerequisites:** UDB182  **Equivalents:** PSB620  **Credit points:** 12  **Contact hours:** 4 per week  **Campus:** Gardens Point  **Teaching period:** 2010 SEM-1

**UDB301 RESEARCH METHODS**
Research Methods will introduce students to the range of methods and techniques that may be utilised in examining questions related to professional practice. A comprehensive overview of research methods will be provided in order that students are able to contribute to research as a part of their professional practice, and to enable them to critically analyse research findings and publications.

**Equivalents:** CNB395  **Credit points:** 12  **Contact hours:** 3 per week  **Campus:** Gardens Point  **Teaching period:** 2010 SEM-1

**UDB302 DEVELOPMENT PROCESS**
This unit brings together concepts gained on strategic evaluation, risk, time management, organisational behaviour, planning, construction and development feasibility analysis. It places this knowledge in a total project context and provides you with an understanding of the processes involved in property development from conception to completion and beyond.

**Credit points:** 12  **Contact hours:** 4 per week  **Campus:** Gardens Point  **Teaching period:** 2010 SEM-2

**UDB381 GEOSPATIAL MAPPING**
This unit will provide the student with a sound knowledge and understanding of image mapping principles (including photogrammetry) and processes as well as practical skills and understanding required to collect spatial information and to produce fundamental mapping products. In addition this unit will provide the skills and knowledge of the principles and characteristics of cartographic communication, surface modelling techniques and digital mapping.

**Credit points:** 12  **Contact hours:** 4 per week  **Campus:** Gardens Point  **Teaching period:** 2010 SEM-1

**UDB382 PHOTOGRAMMETRIC MAPPING**
This unit builds upon the Geospatial Mapping unit to provide the student with developed knowledge and understanding of photogrammetric mapping theory and processes including spatial geometry, mathematics and aerotriangulation. The unit will also provide the student with an integrated knowledge and understanding of map production principles and practice applied to photogrammetric outputs.
The spatial information science application areas of this unit include: application areas; resource management; urban and rural planning; cadastral administration; facilities management. System planning includes a system planning overview, functional requirements analysis, system evaluation and benchmarking. System implementation includes database creation, implementation issues, and implementation strategies. Other aspects include standards, legal issues, and knowledge-based techniques.

Prerequisites: UDB281   Equivalents: PSB612  Credit points: 12  Contact hours: 4 per week  Campus: Gardens Point  Teaching period: 2010 SEM-1

UDB388 SPATIAL ANALYSIS PRACTICE
This unit expands a student’s knowledge in the field of spatial information science within the framework of a practical exercise focussing on advanced spatial analysis techniques. This approach facilitates exposure to and the incorporation of emerging processes of acquisition, validation, storage, extraction, analysis and presentation of spatial information. A geographic information system environment is utilised to provide a practical introduction to industry practices and client expectations. This unit will provide students with enhanced knowledge of the extent, theory and practice of spatial information science and an enhanced ability to define and solve problems associated with manipulation of spatial information systems to meet client expectations.

Prerequisites: UDB281   Equivalents: PSB654  Credit points: 12  Contact hours: 4 per week  Campus: Gardens Point  Teaching period: 2010 SEM-2

UDB483 GLOBAL POSITIONING PRINCIPLES AND PRACTICE
This unit includes the following: GPS operation and navigation messages; GPS observable and error budget; differencing techniques; GPS positioning models and algorithms; software; GPS field observing; various GPS applications in geomatics. It also considers GPS positioning models and algorithms, software, GPS field observing, various GPS applications in geomatics; mapping terms and definitions; the mapping problem; principles for deriving projections; the use of skew graticules; the UTM system.

Prerequisites: UDB383   Equivalents: PSB643  Credit points: 12  Contact hours: 5 per week  Campus: Gardens Point  Teaching period: 2010 SEM-2

UDB484 TOPOGRAPHIC, HYDROGRAPHIC AND MINING SURVEYING
This unit includes the following: field surveys for DTM as-contracted surveys; associated specifications and standards; mining surveying for surface and below surface mining activities; Hydrographic surveying for exploration and port management.

Prerequisites: UDB383   Equivalents: PSB645  Credit points: 12  Contact hours: 5 per week  Campus: Gardens Point  Teaching period: 2010 SEM-2
UDB485 PROPERTY DEVELOPMENT PRACTICE
This unit develops your knowledge and capability to engage in a professional manner with land and property development practice. Land development issues dealt with in preceding units are bought together in this final semester unit to prepare you to fulfil your professional role in the practice of land and property development. This unit will further develop the practical skills necessary for the preparation of lot reconfiguration plans suitable for sealing and registration with appropriate organizations.
Prerequisites: UDB302 and UDB385  Credit points: 12  Contact hours: 4 per week  Campus: Gardens Point  Teaching period: 2010 SEM-1

UDB486 CADASTRAL PRACTICE
This unit includes the following: property rights as a method of resource control; creating and maintaining knowledge of property rights, including issues concerned with parcel identifiers, land tenure, land boundaries, land subdivision, land registration, changing rights through statutory changes, attitudes and responses of the public; evidence of property rights; evolution from customary land tenures to land registration systems; factors leading to breakdown of systems; effects of technological change on land use; evolving property rights and obligations; information technology and land use controls; procedures of the various departments including but not confined to, the Department of Lands, Resources Industries.
Prerequisites: UDB285  Credit points: 12  Contact hours: 5 per week  Campus: Gardens Point  Teaching period: 2010 SEM-2