Bachelor of Engineering (Electrical)/Bachelor of Information Technology (IX54)

Year offered: 2011
Admissions: Yes
CRICOS code: 006384G
Course duration (full-time): 5 years
Domestic Fees (indicative): 2011: CSP $3,878 (indicative) per semester
International Fees (indicative): 2011: $11,875 (indicative) per semester
Domestic Entry: February
International Entry: February
QTAC code: 419512
Past rank cut-off: 81
Past OP cut-off: 10
OP Guarantee: Yes
Assumed knowledge: English (4,SA) and Maths B (4,SA)
Preparatory studies: For information on acquiring assumed knowledge visit http://www.qut.edu.au/assumed-knowledge
Total credit points: 480
Course coordinator: Dr R. Mahalinga-Iyer (Engineering), Mr Mike Roggenkamp (Science & Technology)
Discipline coordinator: Dr Jasmine Banks (Engineering), Mr Richard Thomas (Information Technology Major)
Campus: Gardens Point

Professional Recognition
This course meets the requirements for membership of Engineers Australia (EA). EA is a signatory to the Washington Accord, which permits graduates from accredited member courses to work in various countries across the world. This course is accredited by the Australian Computer Society (ACS). ACS accreditation is internationally recognised by the Seoul Accord.

Other Course Requirements
Bachelor of Engineering students are required to complete at least 60 days of industrial experience in an engineering environment approved by the course coordinator.

Cooperative Education Program
IT’s Cooperative Education Program gives you the opportunity of 10-12 months paid industry placement during your course where you can integrate real experience with what you’re learning in your degree. Companies that QUT’s Coop Ed students have worked with include Energex, Boeing, CITEC, CSC Mining, Environmental Protection Agency, Dialog, UNITAB, RACQ and many Queensland Government departments. The Coop Ed Program is available to Australian citizens and permanent residents only.

Find out more about the Cooperative Education Program.

Pathways to Further Studies
In 2001, the Faculty introduced an accelerated Honours program to increase the number of Bachelor of Information Technology students continuing their studies to complete the Honours year. The program allowed selected high achieving students the opportunity to undertake one postgraduate unit in the final semester of their a BIT degree (or double degree) which would be counted both for completion of the degree and towards the Honours program. The program also provided students with the opportunity to commence theirHonours studies over the Summer Semester.

An alternative to the Honours program is the Master of Information Technology (Research). Students who complete a BIT degree (or double degree) with a grade point average equal to, or greater than 5 (7 point scale) and who have decided against enrolling in an Honours program, could undertake this course. In addition, students may wish to enrol in the re-designed postgraduate coursework Masters which has ten specialisations allowing students to either extend their area of interest or specialise in other areas at the Masters level.

Deferment
Domestic students can defer their offer in this course for one year. In exceptional circumstances up to 12 months of additional deferment may be granted.

Find out more on deferment.

Further Information
For further information about this course, please contact the following:

Engineering Coordinator
Phone +61 7 3138 1993
Fax +61 7 3138 1516
email: bee.enquiries@qut.edu.au

Science and Technology Coordinator
Phone +61 7 3138 2782
Fax +61 7 3138 2703
email: enquiry.scitech@qut.edu.au

Full-time Course structure – Students commencing in 2011
<table>
<thead>
<tr>
<th>Year 1, Semester 1</th>
<th>ENB100 Engineering and Sustainability</th>
<th>OR</th>
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**Electrical Engineering Selectives**

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### Electrical Engineering Selectives

| ENB231            | Materials and Manufacturing 1 |
| ENB334            | Design For Manufacturing |
| ENB339            | Introduction to Robotics |
| ENB350            | Real-time Computer-based Systems |
| ENB352            | Communication Environments For Embedded Systems |
| ENB436            | Mechatronics System Design |
| ENB440            | RF Techniques and Modern Applications |
| ENB441            | Applied Image Processing |
| ENB445            | RF Communication Technologies |
| ENB446            | Wireless Communications |
| ENB448            | Signal Processing and Filtering |
| ENB452            | Advanced Power Systems Analysis |
| ENB453            | Power Equipment and Utilisation |
| ENB454            | Power System Management |

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Published on: 13 June 2012

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IT Breadth Option Unit List

IT Breadth Option Units

You must complete four (4) units from the following list. You should not commence these units until you have completed INB101, INB102, INB103 and INB104.

- INB120 Corporate Systems
- INB210 Databases
- INB220 Business Analysis
- INB250 Foundations of Computer Science
- INB251 Networks
- INB255 Security
- INB270 Programming
- INB271 The Web
- INB272 Interaction Design

IT Specialisation Option Unit List

IT Specialist Option Units

You must complete four (4) units from the following list. Please ensure you have completed a minimum of 36 credit points (3 units) of IT Breadth Option Units before commencing these units. The units are grouped in areas to assist you in focusing your studies.

1. BUSINESS PROCESS MANAGEMENT:
   - INB320 Business Process Modelling
   - INB321 Business Process Management
   - INB322 Information Systems Consulting
   - INB123 Project Management Practice

2. DATA WAREHOUSING:
   - INB340 Database Design
   - INB341 Software Development With Oracle
   - INB342 Enterprise Data Mining and Data Analysis
   - INB343 Advanced Data Mining and Data Warehousing
   - INB344 Search Engine Technology

3. DIGITAL ENVIRONMENTS:
   - INB345 Mobile Devices
   - INB346 Enterprise 2.0
   - INB347 Web 2.0 Applications
   - INB354 Information Resources

4. ENTERPRISE SYSTEMS:
   - INB123 Project Management Practice
   - INB221 Technology Management
   - INB311 Enterprise Systems
   - INB312 Enterprise Systems Applications

5. NETWORK SYSTEMS:
   - INB350 Internet Protocols and Services
   - INB351 Unix Network Administration
   - INB352 Network Planning
   - INB353 Wireless and Mobile Networks

6. SOFTWARE ENGINEERING:
   - INB370 Software Development
   - INB371 Data Structures and Algorithms
   - INB372 Agile Software Development
   - INB374 Enterprise Software Architecture

7. WEB TECHNOLOGIES:
   - INB313 Electronic Commerce Site Development
   - INB373 Web Application Development
   - INB374 Enterprise Software Architecture
   - INB385 Multimedia Systems
   - INB386 Advanced Multimedia Systems

8. UNGROUPED:
   - INB204 Special Topic 1
   - INB205 Special Topic 2
   - INB304 Special Topic 3
   - INB305 Special Topic 4
   - INB306 Project 1
   - INB307 Project 2
   - INB308 Project 3
   - INB355 Cryptology and Protocols
   - INB365 Systems Programming
   - INB381 Modelling and Animation Techniques
   - INB382 Real Time Rendering Techniques
   - INB860 Computational Intelligence for Control and Embedded Systems

Potential Careers:
Computer Systems Engineer, Electrical and Computer Engineer, Electrical Engineer, Engineer.
UNIT SYNOPSES

BEB100 INTRODUCING PROFESSIONAL LEARNING
This unit will introduce students to a range of skills and knowledge sets required to support professional practice in design, engineering and urban development disciplines. It will include information literacy and communication skills and knowledge development. In addition, the unit will provide orientation to design, engineering and 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: BNB007, CNB190, PSB414  Credit points: 12  Contact hours: 3 per week  Campus: Gardens Point

BEB200 INTRODUCING SUSTAINABILITY
This unit will address issues of sustainability from a number of perspectives thus providing students with a variety of lenses on the ways in which the human-made environment impacts on the future of human settlement. The unit will include an introduction to sustainability from a variety of perspectives, including indigenous and other cultural perspectives, and from ecological, economic and technological perspectives. It will demonstrate to students the ways in which contrasting, and sometimes conflicting, ideas about sustainability are prioritised and how these priorities contribute to the impact that design, engineering and urban development professions have on a sustainable future.
Equivalents: PSB422  Credit points: 12  Contact hours: 3 per week  Campus: Gardens Point

BEB701 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).
Assumed knowledge: This unit is not designed for first year students. It is recommended that you check WIL Community Blackboard site for information on enrolment pattern. If you are EN40 student you can only enrol after completing a minimum of 192 cp.  Credit points: 12  Campus: Gardens Point  Teaching period: 2010 SEM-1, 2011 SEM-2 and 2011 SEM-2

BEB801 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: 2011 SEM-1 and 2011 SEM-2

BEB802 PROJECT 2
This unit is usually taken in the final year of study, and is only taken by students completing a two unit project. Students complete an individual project involving the application of skills and knowledge attained during the earlier years of their degree program. This unit will be taken as the second of two ‘project’ units related to the same student project.
Equivalents: CEB415, EEB782-2, EEB889-2  Credit points: 12  Contact hours: 2  Campus: Gardens Point  Teaching period: 2011 SEM-1 and 2011 SEM-2

ENB100 ENGINEERING AND SUSTAINABILITY
This unit introduces you to the essential professional skills and practices of engineers in the context of sustainable development.
Antirequisites: DEB100 and UDB100  Credit points: 12  Contact hours: 3 per week  Campus: Gardens Point  Teaching period: 2011 SEM-1 and 2011 SEM-2

ENB101 ENGINEERING MECHANICS 1
Introduction to statics, forces, moments and couples; resolution and resultant of forces acting on a particle or rigid body; equilibrium of particle or rigid body under forces and/or moments; analytical methods for plane truss analysis; shear force and bending moment in beams; the properties of sections. Dynamics (for electrical engineering students).
Equivalents: CEB109  Credit points: 12  Contact hours: 4 per week  Campus: Gardens Point  Teaching period: 2010 SEM-1
ENB103 ELECTRICAL ENGINEERING
Fundamental quantities in circuits and network laws, response to sinusoidal sources, and circuit measurements, real and reactive power calculation, power factor improvement, electric and magnetic fields, three-phase system and applications, transformer theory.
Prerequisites: MAB126 or MAB131 or MAB180
Equivalents: EEB213 Credit points: 12 Contact hours: 4 per week Campus: Gardens Point Teaching period: 2010 SEM-2

ENB104 ENGINEERING MATERIALS
Atomic Bonding; Crystal Structure; Elastic Deformation; Elasticity Case Study; Plastic Deformation; Defects; Alloying and Strengthening in Metals; Diffusion; Fracture, Fatigue and Creep; Phase and Phase Diagrams; Iron-Carbon Phase Diagram; Transformation of Phases; Introductory to Corrosion; Ceramics, Polymers and Composite Materials, Electronic Materials.
Equivalents: MMB131 Credit points: 12 Contact hours: 5 per week Campus: Gardens Point Teaching period: 2010 SEM-1

ENB110 ENGINEERING STATICS AND MATERIALS
Credit points: 12 Contact hours: 4 per week Campus: Gardens Point Teaching period: 2011 SEM-1 and 2011 SEM-2

ENB120 ELECTRICAL ENERGY AND MEASUREMENTS
This unit introduces you to basic electrical circuit concepts. It requires you to perform circuit analysis, circuit synthesis, and the measurement and testing of relevant quantities within circuits.
Credit points: 12 Contact hours: 3 per week Campus: Gardens Point Teaching period: 2011 SEM-2 and 2011 SUM

ENB130 MECHANICAL AND THERMAL ENERGY
Engineers work with numerous kinds of systems where consideration must be given to the motion within, and associated energy of, the system. This unit introduces the student to the concepts of mechanical and thermal energy in the context of real engineering systems. The inter-relationships of between forces, motion and energy is described as related to the flow of energy within these engineering systems. After an introduction to engineering units, concepts and data, Newton’s first and second laws are used in the description of system motion and the concepts of force and energy, conservation of momentum and conservation of energy are introduced and described. Thermodynamic processes, certain thermo-physical parameters and the first and second law of thermodynamics are introduced and used to describe simple engineering systems. This is then expanded to include the generation and transport of energy through these systems in terms of convection, conduction and radiation heat transfer.
Equivalents: PCB150 Credit points: 12 Contact hours: 4 per week Campus: Gardens Point Teaching period: 2011 SEM-1

ENB150 INTRODUCING ENGINEERING DESIGN
This unit introduces you to engineering design. A multidisciplinary approach is taken with an emphasis in engineering systems, technical design and project management.
Assumed knowledge: ENB110 is assumed knowledge.
Credit points: 12 Contact hours: 4 per week Campus: Gardens Point Teaching period: 2011 SEM-2

ENB200 INTRODUCING ENGINEERING SYSTEMS
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 Teaching period: 2011 SEM-2

ENB231 MATERIALS AND MANUFACTURING 1
Materials and their engineering applications, Manufacturing systems and technology, material properties and manufacturing, material selection, failure, graphical communication.
Assumed knowledge: ENB104 or ENB110 is assumed knowledge. Credit points: 12 Contact hours: 4 per week Campus: Gardens Point Teaching period: 2011 SEM-1

ENB240 INTRODUCTION TO ELECTRONICS
Module Electronics A provides a basic understanding of the characteristics and operation of discrete semiconductor components. Electronic circuit design is introduced with emphasis on the small signal low and high frequency response of those circuits. Module Digital Electronics gives students a good grounding in the basic principles of digital design, with particular regard to the fundamentals of digital number systems, Boolean algebra, combinational and sequential logic design.
Prerequisites: ENB103 or ENB120 Equivalents: EEB312 Credit points: 12 Contact hours: 5 per week Campus: Gardens Point Teaching period: 2011 SEM-1

ENB241 SOFTWARE SYSTEMS DESIGN
The unit introduces students to Software Engineering by considering a whole Software Lifecycle. Each step of the lifecycle is treated in detail, such as concept phase,
ENB242 INTRODUCTION TO TELECOMMUNICATIONS
Telecommunications systems and the principles underlying their operations are introduced starting from mathematical preliminaries such as the Fourier series and the Fourier transform. Analogue modulation techniques (AM and FM), systems and circuits for generation and demodulation, analogue to digital conversion, pulse modulation and baseband digital data communication techniques are studied using time and frequency domain analyses.
Prerequisites: (ENB120 or ENB103) and (MAB126 or MAB110 or MAB111)  
Equivalents: EEB340  
Credit points: 12  Contact hours: 3 per week  
Campus: Gardens Point  
Teaching period: 2011 SEM-1 and 2011 SEM-2

ENB243 LINEAR CIRCUITS AND SYSTEMS
Network analysis; Laplace transform of signals and transfer functions of systems, time and frequency responses of linear circuits, feedback configurations and transfer functions, analyse and designing analogue systems using transistors and operational amplifiers, designing and synthesising analogue filters, signal conditioning.
Prerequisites: ENB120 and MAB126  
Assumed knowledge: ENB240 is assumed knowledge.  
Credit points: 12  Contact hours: 4 per week  
Campus: Gardens Point  
Teaching period: 2011 SEM-2

ENB244 MICROPROCESSORS AND DIGITAL SYSTEMS
This unit covers the basis for electronic circuit design in general but also in connection with microprocessor systems, theory and design of advanced embedded digital systems and practical implementation. The practical application of these circuits including interfacing and environment factors will be considered.
Prerequisites: ENB240  
Assumed knowledge: ENB246 or INB104 is assumed knowledge.  
Credit points: 12  Contact hours: 4 per week  
Campus: Gardens Point  
Teaching period: 2011 SEM-2

ENB245 INTRODUCTION TO DESIGN AND PROFESSIONAL PRACTICE
Introduction to general principles of electronic circuit and electrical equipment design and realisation; design and implementation of basic electronic circuits; experience in undertaking engineering projects, in report writing, and working in teams. The unit gives students the opportunity to apply their theoretical knowledge to real-life engineering problems.
Assumed knowledge: ENB240 and ENB246 or INB104 is assumed knowledge.  
Equivalents: EEB584  
Credit points: 12  Contact hours: 4 per week  
Campus: Gardens Point  
Teaching period: 2011 SEM-2

ENB246 ENGINEERING PROBLEM SOLVING
This unit introduces students to the use of computers as tools for solving engineering problems. MATLAB is introduced as a numerical computing environment with the capacity to support complex mathematics and to be programmed to solve specific engineering problems. Stand alone application development using C++ is introduced as a means of exposing students to the high and low level computer programming concepts that are necessary to the implementation of engineering solutions in hardware specific programming environments.
Assumed knowledge: MAB126 or MAB180 or MAB131, and ENB103 or ENB120 is assumed knowledge.  
Credit points: 12  Contact hours: 4 per week  
Campus: Gardens Point  
Teaching period: 2011 SEM-1

ENB250 ELECTRICAL CIRCUITS
This unit introduces you to electrical circuit analysis. It shows how to determine the transient and steady state solution in single and three phase circuits as well as the interaction of fluxes and currents in transformers and electrical machines.
Prerequisites: ENB120  
Antirequisites: ENB103  
Credit points: 12  Contact hours: 4 per week  
Campus: Gardens Point  
Teaching period: 2011 SEM-1

ENB301 INSTRUMENTATION AND CONTROL
The unit introduces the student to classical control systems, analysis and synthesis, and implementation in an industrial control context. It introduces the principles of electrical measurements and instrumentation, sensors, PLC, DSC and industrial networks, and foundation of feedback control theory for engineers.
Prerequisites: MAB126 or MAB182 or MAB132  
Assumed knowledge: ENB105 or ENB205 or ENB243 are assumed knowledge.  
Credit points: 12  Contact hours: 5 per week  
Campus: Gardens Point  
Teaching period: 2011 SEM-1

ENB334 DESIGN FOR MANUFACTURING
Topics covered in this unit include: basic concepts in the analysis of a mechanical engineering design, relating the design requirements to a range of manufacturing processes; an understanding of the complete manufacturing specifications for mechanical designs based on functional requirements, manufacturing processes, interchangeability
and standardisation; introduction to the basic principles in the design of jigs and fixtures in manufacturing.

**Assumed knowledge:** ENB231 is assumed knowledge.

**Equivalents:** MMB374

**Credit points:** 12

**Contact hours:** 5 per week

**Campus:** Gardens Point

**Teaching period:** 2011 SEM-2

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**ENB339 INTRODUCTION TO ROBOTICS**

This unit introduces you to the components, systems and mathematical foundations of robotics. The unit introduces the technologies and methods used in the design and programming of modern intelligent robots, and encourages critical thinking about the use of robotic technologies in various applications. The unit emphasizes the practical application of robotic theory to the design and synthesis of robotic systems that respond accurately and repeatably.

**Assumed knowledge:** ENB201 or ENB221 and ENB222 are assumed knowledge.

**Equivalents:** MMB451

**Credit points:** 12

**Contact hours:** 5 per week

**Campus:** Gardens Point

**Teaching period:** 2011 SEM-2

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**ENB340 POWER SYSTEMS AND MACHINES**

This is a core unit that develops the basic topics essential for an electrical engineer working in areas that include the resources sector, the process industries, electrical power utilisation, electric power generators as well the electricity supply industry. Topics covered in machines include magnetic circuits, single phase and three phase transformers; electric machines including electromechanical energy conversion, reluctance motors, induction motors, synchronous machines, D.C. machines, stepper motors, P.C. motors; motor control; heating, cooling and rating. Power system topics include power generation and energy sources, electricity market operation, fault calculations, basic protection and power system operation, in particular real and reactive power control.

**Prerequisites:** ENB103 or ENB250

**Contact hours:** 4 per week

**Campus:** Gardens Point

**Teaching period:** 2011 SEM-1

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**ENB342 SIGNALS, SYSTEMS AND TRANSFORMS**

The unit covers the area of Signals in Linear Systems for which a detailed study of Fourier theory applied to both analogue and discrete-time signals and to the analysis of linear systems will be given. Systems will be represented in time as well as in frequency and various characteristics and relationships in the two domains will be discussed. The students will be introduced to the fundamentals of analogue and discrete-time signal processing; analogue and discrete Fourier transform; linear and discrete convolution. Finally, the students will learn the fundamentals of digital filter design and implementation, with examples and applications arising from various disciplines.

**Prerequisites:** ENB242

**Assumed knowledge:** ENB243 and ENB246 are assumed knowledge.

**Credit points:** 12

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**ENB343 FIELDS, TRANSMISSION AND PROPAGATION**

Fundamental concepts of static and time varying electromagnetic fields; Maxwell's equations and the characteristics of their solution, such as wave equations, losses in various media and energy flow; numerical methods; transmission line theory, terminated line, Smith Circle Chart usage and lattice diagram; propagation modes in waveguides and optical fibre; free-space propagation, reflection, refraction, diffraction; basic antenna theories and antenna parameters, Frii's transmission equation, half-wave dipole, two-element array.

**Prerequisites:** ENB103 or ENB250

**Assumed knowledge:** MAB127 or MAB182 or MAB132 is assumed knowledge.

**Equivalents:** EEB641

**Credit points:** 12

**Contact hours:** 4 per week

**Campus:** Gardens Point

**Teaching period:** 2011 SEM-1

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**ENB344 INDUSTRIAL ELECTRONICS**

The unit gives a basic understanding of linear and switching applications in industrial electronics. Practical knowledge associated with interfacing and design is developed. Students will also study the theory and design of advanced digital embedded systems as well as the practicalities associated with implementation. It also covers power rectification, controlled rectification, inverters, AC and DC drives, uninterruptible power supplies and power switching components.

**Prerequisites:** ENB240

**Contact hours:** 4 per week

**Campus:** Gardens Point

**Teaching period:** 2011 SEM-2

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**ENB345 ADVANCED DESIGN AND PROFESSIONAL PRACTICE**

Detailed design and realisation of typical electronic subsystems used in all areas of electrical and electronic systems engineering. The unit enhances the student's ability in solving complex engineering problems. The design builds on the theoretical knowledge gained in other units. The student is required to write a detailed technical report and also give an oral presentation on her/his design.

**Prerequisites:** ENB245

**Equivalents:** EEB684

**Credit points:** 12

**Contact hours:** 4 per week

**Campus:** Gardens Point

**Teaching period:** 2011 SEM-2

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**ENB346 DIGITAL COMMUNICATIONS**

Revolutionary developments in the field of Digital Communication Technology have enabled improvement in the characteristics of communication systems in order to meet the performance requirements for transmission of information for private, business and industrial applications. This unit which covers Elements of a Digital Communication System aims at providing the students with an in-depth
understanding of the theory and applications of digital communication systems and technology.

Prerequisites: ENB342  Assumed knowledge: MAB233 is assumed knowledge.  Equivalents: EEB560  Credit points: 12  Contact hours: 4 per week  Campus: Gardens Point  Teaching period: 2011 SEM-2

ENB350 REAL-TIME COMPUTER-BASED SYSTEMS
This unit covers the area of embedded systems and real-time kernels. C programming is reviewed in the context of real-time applications where it is often mixed with assembly language. Data representations, input-output programming, concurrency, scheduling, memory management and system initialisation are discussed. Programming laboratory exercises introduce development tools and reinforce fundamental concepts such as polling, interrupt driven input-output, serial port communication, pre-emptive and non pre-emptive scheduling, resource sharing, priority inversion and deadlock. Students develop a simple real-time process control application using programmable logic and micro-controllers.

Prerequisites: ENB244  Equivalents: EEB666  Credit points: 12  Contact hours: 4 per week  Campus: Gardens Point  Teaching period: 2011 SEM-1

ENB352 COMMUNICATION ENVIRONMENTS FOR EMBEDDED SYSTEMS
This unit addresses the following: computer networks; network programming; open network foundations; embedded systems; client/server; bus architectures; network controllers; distributed systems in automation and process control; embedded Java; distributed objects; distributed databases; distributed operating systems.

Prerequisites: ENB350  Equivalents: EEB666  Credit points: 12  Contact hours: 4 per week  Campus: Gardens Point  Teaching period: 2011 SEM-2

ENB436 MECHATRONICS SYSTEM DESIGN
This unit provides students with an understanding of design and interpretation of hydraulic and pneumatic circuits (including graphical symbols, fluid logic and components of fluid systems) and a basic understanding of PLC programming for control of manufacturing systems with the emphasis on hands on practice of developing a control system for a given process. Topics include the following: mechatronics systems design; power supply; introduction to fluid power and graphical symbols; hydraulic and pneumatic systems; simple circuits; fluid logic; logic symbols and circuits; hydraulic components, fluids, system design, circuits; pressure compensated flow control.

Prerequisites: ENB334  Equivalents: MMB478  Credit points: 12  Contact hours: 4 per week  Campus: Gardens Point  Teaching period: 2011 SEM-1

ENB440 RF TECHNIQUES AND MODERN APPLICATIONS
This unit addresses the following: lumped and distributed microwave and RF circuits, including [y], [t] and [s] parameters; impedance matching techniques; passive and active microwave devices; RF circuit design techniques; microwave and RF measurement techniques; linear antennas and microwave antennas; analysis and synthesis of antenna arrays; specialised antennas and antenna measurements; EMC definition, standards and regulations; test plan; measurements; interference coupling; susceptibility; EMC design techniques, component selection, circuit layouts, grounding, shielding, filters, suppressors, isolation and safety; EMC management; propagation of electromagnetic fields in electrical materials; application of numerical methods.

Prerequisites: ENB343  Antirequisites: ENB445  Assumed knowledge: ENB242 and ENB244 are assumed knowledge.  Credit points: 12  Contact hours: 5 per week  Campus: Gardens Point  Teaching period: 2011 SEM-1

ENB441 APPLIED IMAGE PROCESSING
The aim of this unit is to introduce the fundamentals and applications of image processing to the students. The unit covers topics such as image acquisition, image representation, image enhancement, image segmentation, and image filtering. These topics will be introduced using a project based approach with applications to engineering practical problems.

Prerequisites: ENB342  Credit points: 12  Contact hours: 4 per week  Campus: Gardens Point  Teaching period: 2011 SEM-1

ENB445 RF COMMUNICATION TECHNOLOGIES
The unit covers various communication and signal processing technologies that are used in point to point and point to multi-point; wired and wireless communications including microwave terrestrial and satellite communication; last miles solutions including ADSL, VDSL and wireless local loops; ad hoc radio transmission such as the Bluetooth and Home RF, Wireless LANs including wireless infrared transmission and IEEE8012.11 standard.

Prerequisites: ENB343  Assumed knowledge: ENB242 and ENB244 are assumed knowledge.  Equivalents: EEB766  Credit points: 12  Contact hours: 5 per week  Campus: Gardens Point

ENB446 WIRELESS COMMUNICATIONS
This unit addresses the following: cellular mobile radio system concepts; mobile radio propagation; spread spectrum techniques and CDMA; speech coding modulation and channel coding techniques for GSM and CDMA; fading mitigation through diversity; inter-symbol interference mitigation; the GSM and CDMA standards; the WAP and...
the GPRS; introductions to UMTS/IMT2000; introduction to personal communications; introduction to blue tooth technology; other wireless systems including wireless LAN, wireless local loop, microwave local multipoint distribution systems (LMDS) and LEO satellite communication.

**Prerequisites:** ENB346  
**Equivalents:** EEB960  
**Credit points:** 12  
**Contact hours:** 4 per week  
**Campus:** Gardens Point  
**Teaching period:** 2011 SEM-2

**ENB455 POWER ELECTRONICS**

The unit introduces the student to advanced industrial electronics and power converters with different applications. Students learn how to model power converters, design a controller and simulate power electronic systems using Matlab/Simulink software for different applications. They also learn practical issues such as EMI, efficiency and losses to design a controller and power circuits.

**Prerequisites:** ENB344  
**Credit points:** 12  
**Contact hours:** 4 per week  
**Campus:** Gardens Point  
**Teaching period:** 2011 SEM-1

**ENB456 ENERGY**

Renewable energy sources including solar and wind energies are becoming more important than ever due to increasing energy demand, dwindling oil and gas supplies, increasing pollution levels in the atmosphere and the associated global warming effects. Renewables may also help improve competitiveness and have a positive impact on regional development and employment.

An overview of the different energy sources will be covered followed by an understanding of the characteristics of solar energy, radiation calculation, measurements and applications in remote, hybrid and grid interactive configurations. Students will be equipped with fundamentals of alternative energy sources including solar thermal, photovoltaics and wind conversion technologies.

**Assumed knowledge:** MAB262 or MAB180 or MAB131 are assumed knowledge.  
**Equivalents:** EEB911  
**Credit points:** 12  
**Contact hours:** 4 per week  
**Campus:** Gardens Point  
**Teaching period:** 2011 SEM-2
modelling and control system design using state space techniques, linear optimal control, non-linear systems, and adaptive control with applications of neuro-computing and fuzzy logic.

**Prerequisites:** ENB301  Credit points: 12  Contact hours: 4 per week  Campus: Gardens Point  Teaching period: 2011 SEM-2

**INB101 IMPACT OF IT**
You will gain an appreciation of the massive and positive impact that IT has had on a wide range of fields including business, science, engineering, education and health. You will learn about the benefits of increased productivity due to IT. You will consider ethical issues and possible negative impacts of IT. You will raise your awareness of the social implications of IT systems for society at the global, local and personal levels. You will develop an informed position on issues, and justify your reasoning with considered supportive arguments.

**Antirequisites:** INN101  Credit points: 12  Contact hours: 3 per week  Campus: Gardens Point  Teaching period: 2011 SEM-1 and 2011 SEM-2

**INB102 EMERGING TECHNOLOGY**
The aim of this unit is to provide you with a conceptual framework so that you clearly identify Information Technologies and their purpose. This task will be fun as it covers a wide spectrum of ideas and allows us to examine some currently popular technologies. Information Technology has become so entwined with everyday life that identifying its scope is difficult, which also makes it difficult to identify opportunities where IT might further infiltrate into our daily lives for work and play. To achieve these aims, the unit introduces you to some of the theories and engineering practicalities that have already resulted in technological advances in the area of information technology. Concepts leading to existing technologies are introduced during lectures, which are followed by laboratory sessions where students will be encouraged to discuss social change, future information tools and explore the concepts required for constructing these technologies.

**Equivalents:** ITB005  Credit points: 12  Contact hours: 3 per week  Campus: Gardens Point  Teaching period: 2011 SEM-1 and 2011 SEM-2

**INB103 INDUSTRY INSIGNS**
This unit aims to develop your awareness of the career possibilities in the ICT industry and to equip you with some of the essential skills required of an ICT professional. The unit helps you to derive a roadmap for your career; to enable you to identify the qualities, skills and interests you need to possess, to plan your career path. The unit will also introduce you the inter-disciplinary nature of ICT careers.

**Antirequisites:** INN500  Assumed knowledge: Completion of 48 credit points of an Undergraduate study is assumed knowledge.  Credit points: 12  Contact hours: 3 per week  Campus: Gardens Point  Teaching period:
INB201 SCALABLE SYSTEMS DEVELOPMENT

Information technology is a key enabling tool in a rapidly evolving global economy. IT systems underpin innovation across a range of application areas including business, economics, science, engineering, education and the arts. In order to educate graduates in this climate, Scalable Systems Development adopts an integrated approach to provide broad hands-on experiences designed to orient students to the range of possibilities within the IT discipline.

This team-based unit is an extension of project work introduced in Building IT Systems. Within a concrete, project-based context students will encounter the practical challenges of designing and implementing a substantial IT system. The unit aims to increase students’ awareness of the potential of IT in enabling innovation through providing active, constructive and challenging problem-based learning experiences.

Prerequisites: (INB102 or ITB005) and (INB104 or ITB001)
Assumed knowledge: Completion of 36cp of Breadth units is assumed knowledge
Equivalents: ITB007
Credit points: 12 Contact hours: 3 per week Campus: Gardens Point Teaching period: 2011 SEM-1

INB204 SPECIAL TOPIC 1

This unit gives you the opportunity to apply, under appropriate guidance, the knowledge and skills gained in your course to date and to execute a substantial development project. The ability to apply technical knowledge and skills to real-life situations is essential for information technology professionals. A substantial project, under academic supervision, will develop your initiative and ability to apply your knowledge and skills in a professional capacity. Completing the project will also enable you to appreciate the complementary nature of the course material in total, particularly the need for careful project management.

Prerequisites: INB371
Assumed knowledge: Knowledge of programming in Java, C# or C++. Knowledge of basic data structures (stacks, queues, trees, linked lists, hash tables), complexity analysis
Credit points: 12 Contact hours: 3 per week Campus: Gardens Point
Teaching period: 2011 SEM-1 and 2011 SEM-2

INB210 DATABASES

Databases and database systems are essential items that support many aspects of everyday life in modern society. All graduates from a course in Information Technology will be expected by employers to understand the concepts and terminology of databases. The aim of this unit is to introduce you to the structure and role of databases in modern organisations.

Antirequisites: INN210
Equivalents: ITB004
Credit points: 12 Contact hours: 3 per week Campus: Gardens Point Teaching period: 2011 SEM-2

INB220 BUSINESS ANALYSIS

This unit is aimed to give you an introduction to the role, knowledge, and skills required of a business analyst. This unit focuses on both the trades—tools and methods used by a business analyst, as well as the soft skills—creativity and communication, both of which are critical to successful business and requirements analysis. Through lectures, cases studies and role playing activities, you will develop basic knowledge and skills required for introductory business analysis (BA).

Antirequisites: INN220
Credit points: 12 Contact hours: 3 per week Campus: Gardens Point Teaching period: 2011 SEM-1

INB221 TECHNOLOGY MANAGEMENT

This unit presents operational, tactical and strategic insights that support the activities central to the leadership and management of technology. These insights include project management, organisational leadership, outsourcing, planning, governance and millennium technologies. Such insights are used to inform decision-making - the core skill of any manager. Technology managers must understand the factors influencing any decision point. This unit equips students for the challenges of management and to contribute to the decision-making faced by managers and the staff who advise on these issues.

Prerequisites: INB103 or ITB002 or INB120 or ITB360
Antirequisites: ITN241, ITN251 and ITN366
Equivalents: ITB366, ITB241
Credit points: 12 Contact hours: 3 per week Campus: Gardens Point
Teaching period: 2011 SEM-1

INB250 FOUNDATIONS OF COMPUTER SCIENCE

Contemporary computer-based systems are built from a wide range of technologies working at different levels of abstraction, from microprocessor hardware, to operating system and application software, to entire communications networks. At each abstraction level different techniques are applied to solve problems in a range of application areas.

This unit introduces computational techniques involving numerical simulations and visualization. These skills will be applied to solve problems in a range of application areas. The programming language MATLAB will be used, along with the simulation environment NetLogo.

Credit points: 12 Contact hours: 3 per week Campus: Gardens Point
Teaching period: 2011 SEM-1 and 2011 SEM-2
needed to understand emergent properties of the system. This unit introduces some of the foundational principles commonly used to reason about the behaviour of computer-dependent systems at different levels of abstraction. Most of the techniques are derived from the field of Discrete Mathematics and are the foundation of the discipline called Computer Science.

Assumed knowledge: Basic familiarity with set theory (Venn diagrams and set operators), elementary algebra (polynomial and summation expressions, exponents and logarithms, etc) and simple probability concepts (permutations and combinations).

Prerequisites: INB104 or ENB246 Antirequisites: INN270 Equivalents: ITB006 Credit points: 12
Contact hours: 3 per week Campus: Gardens Point Teaching period: 2011 SEM-2

INB251 NETWORKS
Computer systems and communications networks are essential to the activities of modern organisations. When you graduate from a course in Information Technology, employers expect you to have a sound understanding of the terminology and concepts of computer systems, communications networks, and network services. This unit provides you with an introductory study of communications network technologies and network applications. The unit serves as an entry point to further specialised studies in the field of computer network systems.

Prerequisites: INN251 Equivalents: ITB006 Credit points: 12 Contact hours: 3 per week Campus: Gardens Point Teaching period: 2011 SEM-2

INB255 SECURITY
This unit aims to give you an understanding of the major issues in information security. You will be able to identify critical information security concepts and determine the information security implications of interactions between entities. You will have knowledge of a range of techniques for protecting information, and understand the limitations of these techniques. You will be aware of international information security management standards.

Prerequisites: ITB161, ITB523, ITB623, ITN161 and INN255 Equivalents: ITB730 Credit points: 12 Contact hours: 3 per week Campus: Gardens Point Teaching period: 2011 SEM-1

INB270 PROGRAMMING
This unit aims to give you a positive introduction to the skills required in solving computational problems and implementing solutions in a programming or scripting language. Although some theoretical aspects of computer programming are introduced briefly, the overall emphasis of the unit is programming practice. The unit emphasises generic programming concepts and related problem-solving strategies. The skills you learn in this unit will be applicable to a wide variety of commonly-used, industrially-significant programming and scripting languages.

Prerequisites: INB104 or ENB246 Antirequisites: INN270 Equivalents: ITB006 Credit points: 12 Contact hours: 3 per week Campus: Gardens Point Teaching period: 2011 SEM-1 and 2011 SEM-2

INB271 THE WEB
The aims of the unit are to give you a thorough understanding of what the web is, how it works and what it has to offer. Additionally, the unit aims to give you a general understanding of the skills and knowledge that will be required to ensure the successful implementation of business web applications. The unit is designed to familiarise you with the techniques that will enable you to become a knowledgeable user of the web and to use the web to demonstrate your understanding of the social, environmental and economic issues relating to web-based systems. The unit provides an introduction to the use of web programming and scripting languages.

Prerequisites: INB104 Antirequisites: INB373 and INN373 and ITB007 and ITB227 and ITN007 and ITN227 Credit points: 12 Contact hours: 3 per week Campus: Gardens Point Teaching period: 2011 SEM-1

INB272 INTERACTION DESIGN
This unit aims to give you an understanding of the major issues in information security. You will be able to identify critical information security concepts and determine the information security implications of interactions between entities. You will have knowledge of a range of techniques for protecting information, and understand the limitations of these techniques. You will be aware of international information security management standards.

Prerequisites: INB104 Antirequisites: INB373 and INN373 and ITB007 and ITB227 and ITN007 and ITN227 Credit points: 12 Contact hours: 3 per week Campus: Gardens Point Teaching period: 2011 SEM-1

INB301 THE BUSINESS OF IT
As an IT professional you are more and more evaluated in terms of the business value that you produce. This unit will prepare you for professional practice by making you "business savvy," i.e. giving you the business knowledge and skills that will help you with your future career and job. In particular the unit will address three themes: (1) career development tools, (2) entrepreneurship & innovation, and (3) business and IT strategy. You will be introduced to career development tools that enable you to self-manage your career and life. You will learn how to critically think about the requirements of a job and reflect upon your own experiences and learn how to communicate them. You will also learn about the entrepreneurial process.

Prerequisites: INB103 or INB181 Equivalents: ITB254 Credit points: 12 Contact hours: 3 per week Campus: Gardens Point Teaching period: 2011 SEM-2
of identifying a business opportunity and how to take advantage of that opportunity. In addition, you will gain an understanding of core strategic concepts and models, discuss typical strategy tools and then apply them to the 'Business of IT'.

**Antirequisites:** ITB009  
**Assumed knowledge:** Completion of 120 credit points within BIT is assumed

**Credit points:** 12  
**Contact hours:** 4 per week  
**Campus:** Gardens Point  
**Teaching period:** 2011 SEM-1 and 2011 SEM-2

**INB304 SPECIAL TOPIC 3**

Traditional Artificial Intelligence (AI) aims at satisfying the Turing test, that is, it aims at making computers indistinguishable from humans. Computer games AI aims at giving Non-Player Characters (NPC) behavioural artefacts that complement a game narrative. Computer game AI is a special area of study that deals with algorithmic approaches to entertainment affects in NPC. Students will develop in this unit an understanding of problems, solutions and algorithms that generally defines the current state of computer game AI. The aim of this unit is to provide students with an intermediate level course in computer game AI that involves a set of the most relevant algorithms and their applications in the interactive entertainment and game industries.

**Prerequisites:** INB210 or ITB004 or INB122  
**Credit points:** 12  
**Contact hours:** 3 per week  
**Campus:** Gardens Point  
**Teaching period:** 2011 SEM-1 and 2011 SEM-2

**INB305 SPECIAL TOPIC 4**

INB305 BGIE Project Design Phase (P1) extends your work on the role, design, and plan of a computer game concept. The unit covers the conceptualisation and game design stages up to the game design pitch. If the project is given a green light by the assessment panel, it may be developed later in the P2 unit.

**Prerequisites:** INB371  
**Credit points:** 12  
**Contact hours:** 3 per week  
**Campus:** Gardens Point  
**Teaching period:** 2011 SEM-1 and 2011 SEM-2

**INB306 PROJECT 1**

This unit gives you the opportunity to apply, under appropriate guidance, the knowledge and skills gained in your course to date and to execute a substantial development project. The ability to apply technical knowledge and skills to real-life situations is essential for information technology professionals. A substantial project, under academic supervision, will develop your initiative and ability to apply your knowledge and skills in a professional capacity. Completing the project will also enable you to appreciate the complementary nature of the course material in total, particularly the need for careful project management.

**Prerequisites:** INB101, INB102, INB103, INB104 and INB201  
**Assumed knowledge:** As a minimum requirement you must have completed at least 132 credit points of IT units, including INB101, INB102, INB103, INB104, INB201, four breadth units, and at least two specialisation units.  
**Equivalents:** ITB230  
**Credit points:** 12  
**Contact hours:** 3 per week  
**Campus:** Gardens Point  
**Teaching period:** 2011 SEM-1, 2011 SEM-2 and 2011 SUM

**INB307 PROJECT 2**

This unit gives you the opportunity to apply, under appropriate guidance, the knowledge and skills gained in your course to date and to execute a substantial development project. The ability to apply technical knowledge and skills to real-life situations is essential for information technology professionals. A substantial project, under academic supervision, will develop your initiative and ability to apply your knowledge and skills in a professional capacity. Completing the project will also enable you to appreciate the complementary nature of the course material in total, particularly the need for careful project management.

**Assumed knowledge:** Assumed knowledge is completion of 192cp of which at least 144cp must be IT units  
**Equivalents:** ITB791  
**Credit points:** 12  
**Contact hours:** 3 per week  
**Campus:** Gardens Point  
**Teaching period:** 2011 SEM-1, 2011 SEM-2 and 2011 SUM

**INB308 PROJECT 3**

This unit gives you the opportunity to apply, under appropriate guidance, the knowledge and skills gained in your course to date and to execute a substantial development project. The ability to apply technical knowledge and skills to real-life situations is essential for information technology professionals. A substantial project, under academic supervision, will develop your initiative and ability to apply your knowledge and skills in a professional capacity. Completing the project will also enable you to appreciate the complementary nature of the course material in total, particularly the need for careful project management.

**Assumed knowledge:** Assumed knowledge is completion of 192 credit points of which at least 144 credit points must be for IT units  
**Credit points:** 12  
**Contact hours:** 3 per week  
**Campus:** Gardens Point  
**Teaching period:** 2011 SEM-1, 2011 SEM-2 and 2011 SUM
INB309 MAJOR PROJECT
This unit gives you the opportunity to apply, under appropriate guidance, the knowledge and skills gained in your course to date and to execute a substantial development project over two semesters. The ability to apply technical knowledge and skills to real-life situations is essential for information technology professionals. A substantial project, under academic supervision, will develop your initiative and ability to apply your knowledge and skills in a professional capacity. Completing the project will also enable you to appreciate the complementary nature of the course material in total, particularly the need for careful project management.

Prerequisites: INB309-1 (can be enrolled in the same teaching period)  
Antirequisites: ITB844  
Assumed knowledge: Completion of at least 144 credit points of IT units, including INB101, INB102, INB103, INB104, INB201, four breadth units, and at least two specialisation units is assumed knowledge.  
Credit points: 12  
Contact hours: 3 per week  
Campus: Gardens Point  
Teaching period: 2011 SEM-1, 2011 SEM-2 and 2011 SUM

INB309 MAJOR PROJECT
This unit gives you the opportunity to apply, under appropriate guidance, the knowledge and skills gained in your course to date and to execute a substantial development project over two semesters. The ability to apply technical knowledge and skills to real-life situations is essential for information technology professionals. A substantial project, under academic supervision, will develop your initiative and ability to apply your knowledge and skills in a professional capacity. Completing the project will also enable you to appreciate the complementary nature of the course material in total, particularly the need for careful project management.

Prerequisites: INB101 and INB102 and INB103 and INB104 and INB201  
Assumed knowledge: Completion of at least 144 credit points of IT units, including INB101, INB102, INB103, INB104, INB201, four breadth units, and at least two specialisation units is assumed knowledge.  
Equivalents: ITB844  
Credit points: 12  
Contact hours: 3 per week  
Campus: Gardens Point  
Teaching period: 2011 SEM-1, 2011 SEM-2 and 2011 SUM

INB311 ENTERPRISE SYSTEMS
The unit presents and discusses the Enterprise Systems Lifecycle model, orienting students to the requirements of addressing total cost of ownership, change management requirements and process modelling requirements in order to achieve business benefits. Concepts of Enterprise Systems success and associated enablers and barriers are also introduced. This unit introduces the technical architecture of complex 3-tiered client server environments. It seeks to show how an integrated complex database environment meets common business needs, and yet fails to meet the total Information Systems requirements.

Antirequisites: INN311  
Credit points: 12  
Contact hours: 3 per week  
Campus: Gardens Point  
Teaching period: 2011 SEM-2

INB312 ENTERPRISE SYSTEMS APPLICATIONS
The aim of this unit is to introduce one of the more complex and comprehensive Enterprise Systems applications. This unit introduces the business perspective and application processes of modules (such as FI, CO, PP, MM and S&D) and investigates the support provided by these systems and the integration between modules by following some of the major processes in a business. The unit enables you to experience both the business analyst view and the user's view of the system across a number of business processes.

Antirequisites: ITB233, INN312  
Credit points: 12  
Contact hours: 3 per week  
Campus: Gardens Point  
Teaching period: 2011 SEM-1

INB313 ELECTRONIC COMMERCE SITE DEVELOPMENT
This unit will enable you to specify, design, implement and maintain effective e-commerce applications. You will obtain a broad understanding of the potential of e-commerce and how it can be employed to benefit an organisation. You will get direct experience of creating an e-commerce storefront following a business to business (B to B) or business to consumer (B to C) model. You will also have an understanding of the computer systems that underpin e-commerce including payment systems and secure transactions.

Equivalents: ITB260  
Credit points: 12  
Contact hours: 3 per week  
Campus: Gardens Point  
Teaching period: 2011 SEM-2

INB320 BUSINESS PROCESS MODELLING
The aim of this unit is to introduce you to modern methodologies of business process modelling. A main objective is to increase your awareness of the conceptual foundation of modelling and for the capabilities of BPMN and available tools. You will learn how to use grammars and tools to build, maintain and communicate practically relevant process models.

Equivalents: ITB298  
Credit points: 12  
Contact hours: 3 per week  
Campus: Gardens Point  
Teaching period: 2011 SEM-2

INB321 BUSINESS PROCESS MANAGEMENT
The aim of this unit is to introduce you to modern methodologies of Business Process Management. A main objective is to increase your awareness of the close link between business requirements and IT capabilities, and the related fundamental role of business processes. This unit also seeks to develop logical thinking, an appreciation for conceptual models, and the capability to understand and deal with complex systems.

Antirequisites: INN321  Credit points: 12  Contact hours: 3 per week  Campus: Gardens Point  Teaching period: 2011 SEM-1

INB322 INFORMATION SYSTEMS CONSULTING
The aim of the unit is to develop your skills in the consulting engagement process. This unit will give you an appreciation of the management of consulting practices and an understanding of the consulting sector generally. This unit presents the tactical and strategic issues involved in management consulting, and in particular: client engagement. In the unit there is an emphasis on Information Systems (IS) related work. IS constitutes a substantial portion of consulting activity and cuts across all areas of business expertise. The unit examines the dynamics of IS consulting within the context of large consulting firms and familiarises students with the consulting engagement lifecycle.

Antirequisites: ITB264, ITN264  Assumed knowledge: Completion of 96 credit points of an Undergraduate study is assumed knowledge  Credit points: 12  Contact hours: 3 per week  Campus: Gardens Point  Teaching period: 2011 SEM-1

INB335 INFORMATION RESOURCES
This unit will help you to understand the structure of the information environment, to reflect upon the information resources you discover, and to develop the ability to find appropriate information for future problem solving. You will develop your skills in identifying, accessing, evaluating and retrieving information resources to meet specific information needs. The unit will also help you develop skills in teamwork and oral and written communication.

Antirequisites: INN335  Equivalents: ITB322  Credit points: 12  Contact hours: 3 per week  Campus: Gardens Point  Teaching period: 2011 SEM-2

INB340 DATABASE DESIGN
The aim of this unit is to help you develop your knowledge, understand a formal specification tool (ORM) for modelling information systems unambiguously and to apply this formal technique to conceptualise information systems found in many real-world application domains.

Prerequisites: INB210 or ITB004  Antirequisites: ITB229  Credit points: 12  Contact hours: 3 per week  Campus: Gardens Point  Teaching period: 2011 SEM-1

INB341 SOFTWARE DEVELOPMENT WITH ORACLE
This unit aims to develop a sound understanding of database creation, installation, administration, management, security, back up/recovery and application development. The unit aims to develop practical skills in each of these elements, using appropriate Oracle software.

It is expected that students undertaking this unit will have prior knowledge of relational database terminology and concepts, be thoroughly able to develop SQL for querying, updating and creating tables, and have a sound knowledge of database design.

Prerequisites: INB210 or ITB004 or INB122  Equivalents: ITB223  Credit points: 12  Contact hours: 3 per week  Campus: Gardens Point  Teaching period: 2011 SEM-2

INB342 ENTERPRISE DATA MINING AND DATA ANALYSIS
This unit will provide a comprehensive theoretical coverage of various topics in data and web mining. In addition there will be a significant practical component using hands on tools to solve real-world problems. Specifically, we will consider techniques from machine learning, data mining, text mining, and information retrieval to extract useful knowledge from data which are used for business intelligence, document databases, site management, personalization, and user profiling. This unit will first cover a detailed overview of the mining process and techniques, and then concentrate on applications of these techniques to web, e-commerce, document databases and data from advanced applications.

Prerequisites: INB122 or INB210 or INB340 or AYB114  Antirequisites: INN342  Equivalents: ITB239  Credit points: 12  Contact hours: 3 per week  Campus: Gardens Point  Teaching period: 2011 SEM-2

INB343 ADVANCED DATA MINING AND DATA WAREHOUSING
Data warehousing and mining have been well recognized as the dominating techniques for using databases in the future. This unit discusses the concepts, structures and algorithms of data warehousing and mining, e.g., data architecture and quality, data warehouse and data mart, data cubes, OLAP, patterns, association rules and decision tables. Through this study, students will be able to demonstrate knowledge and skills of designing, developing and implementing data warehousing components in SQL environments. It also
enables students to design systems and tools that provide services to data management and analysis, such as data warehouses, data mining tools, business intelligence based systems, smart information use systems, and data processing systems.

**Prerequisites:** INB210  
**Antirequisites:** INN343  
**Credit points:** 12  
**Contact hours:** 3 per week  
**Campus:** Gardens Point  
**Teaching period:** 2011 SEM-1

**INB344 SEARCH ENGINE TECHNOLOGY**

**Prerequisites:** INB371  
**Assumed knowledge:** Intermediate programming experience with intermediate-level knowledge of data structures and algorithms  
**Credit points:** 12  
**Teaching period:** 2011 SEM-1

**INB345 MOBILE DEVICES**

This unit provides the opportunity for exploring new and emerging mobile devices and wireless technology including iPhone, Netbook, 3G, WiMax, and RFID. Students will critically review and understand how they can be used for current contexts such as government, business, education and social community, as well as emerging 'wilderness' environments with no power and wired communication. Students will appreciate the impacts of these devices and be inspired for the current and future opportunities in ICT usage trends.

**Credit points:** 12  
**Contact hours:** 3 per week  
**Campus:** Gardens Point  
**Teaching period:** 2011 SEM-1

**INB346 ENTERPRISE 2.0**

Web technologies and applications are reshaping contemporary organisations. By 2009 it has been predicted that more than 80% of organisations will have blogs and more than 50% of organisations will have wikis as part of their business solutions and strategies. Furthermore, with the advent of Cloud Computing, many companies are outsourcing key business functions to external web applications. The successful contemporary organisation requires expertise in not just business and management practice but in the critical design, use and consequences of new and emerging technologies. This unit will explore the ways in which IT has impacted on how organisations design and deliver activities and services internally and externally. The aim of this unit is to provide you with an understanding of how web 2.0 is changing the way contemporary organisations function.

**Credit points:** 12  
**Contact hours:** 3 per week  
**Campus:** Gardens Point  
**Teaching period:** 2011 SEM-2

**INB347 WEB 2.0 APPLICATIONS**

Web 2.0 applications enable the user to be control. The unit will provide the opportunity for students to explore web 2.0 applications including blogs, wikis, social networking, social tagging, podcasts, gaming, storytelling and virtual worlds such as second life. Students will critically consider the many and varied web applications and how they can be used in different contexts such as government, small and medium size businesses, non-profit organisations, educational institutions and community groups.

**Credit points:** 12  
**Contact hours:** 3 per week  
**Campus:** Gardens Point  
**Teaching period:** 2011 SEM-1

**INB350 INTERNET PROTOCOLS AND SERVICES**

An understanding of the theoretical and practical concepts of network protocols and services is highly useful and relevant to network engineers and others working in the Information Processing industries. This unit introduces you to Internet protocols and the design, implementation and operation of network based applications. Theory and practical skills taught in this unit will be useful if you intend undertaking further networking units.

**Prerequisites:** INB251 or ITB006 or ITB510  
**Antirequisites:** ITB624, ITB629, ITB720, ITN525, ITN667, ITN720  
**Credit points:** 12  
**Contact hours:** 3 per week  
**Campus:** Gardens Point  
**Teaching period:** 2011 SEM-1

**INB351 UNIX NETWORK ADMINISTRATION**

The aim of this unit is to provide students with a working knowledge of the technical aspects and theory of network administration and management. The unit uses the Unix environment as the learning platform for attaining technical skills and for the development of problem solving skills necessary to be a successful networking professional.

**Prerequisites:** INB350  
**Equivalents:** ITB721, ITB625, ITB535, ITB525  
**Credit points:** 12  
**Contact hours:** 3 per week  
**Campus:** Gardens Point  
**Teaching period:** 2011 SEM-2

**INB352 NETWORK PLANNING**

The unit draws together subject matter from a number of different networking-related areas. The aim of the unit is to assemble the previously acquired knowledge and techniques and apply it in a cohesive fashion to the task of network planning.

**Prerequisites:** INB350  
**Antirequisites:** ITB551, ITB628, ITB722, INN352, ITN551, ITN722, ENN523  
**Credit points:** 12  
**Contact hours:** 3 per week  
**Campus:** Gardens Point  
**Teaching period:** 2011 SEM-2

**INB353 WIRELESS AND MOBILE NETWORKS**

This unit provides you with the skills to be able to design and understand the issues involved with different types of wireless communications systems. It develops your knowledge of Wide Area Networks (WANs), Local Area
Networks (LANs) and Personal Area Networks (PANs) as well as skills in programming for mobile handsets. You will also develop knowledge of the different types of wireless communications technologies available and when each is most applicable in a particular situation.

Prerequisites: INB251 or ITB006  
Assumed knowledge: Networks or equivalent networking knowledge is assumed knowledge  
Equivalents: ITB723  
Credit points: 12  
Contact hours: 3 per week  
Campus: Gardens Point  
Teaching period: 2011 SEM-1

INB355 CRYPTOLOGY AND PROTOCOLS
Cryptographic techniques are widely used to implement computer and network security. As an IT security professional you may be required either to evaluate or implement information systems using cryptographic algorithms and protocols. This elective unit covers the main cryptographic technical concepts including encryption, digital signatures and cryptographic protocols.

Antirequisites: ITB646, ITB548, ITB566  
Assumed knowledge: Maths B or equivalent is assumed knowledge.  
Equivalents: ITB732  
Credit points: 12  
Contact hours: 3 per week  
Campus: Gardens Point  
Teaching period: 2011 SEM-1

INB365 SYSTEMS PROGRAMMING
Systems programming is an essential part of any computer-science education. This unit uses operating system concepts to teach the foundations of systems programming and advanced concepts for producing softwares that provide services to computer hardware. Through this study, you will be able to demonstrate knowledge of the principles and techniques of process management, memory and file management, protection & security, and distributed systems.

Prerequisites: INB270 or ITB003 or INB371  
Antirequisites: ITB745, ITB706, INN365  
Assumed knowledge: Fundamentals of computer architecture; high level programming languages (such as C, C++, Java Python) is assumed knowledge.  
Credit points: 12  
Contact hours: 3 per week  
Campus: Gardens Point  
Teaching period: 2011 SEM-2

INB370 SOFTWARE DEVELOPMENT
Understanding software development is an integral part of the IT industry for software engineers. Software development relies on object technologies, programming techniques and numerous code libraries provided by language developers and third party vendors. Integrated Development Environments, unit testing frameworks, automated and continuous build tools and versioning systems are all becoming part of the tool set modern software developers must be familiar with. This unit is designed to introduce these technologies and techniques to show how software can be rapidly developed.

Prerequisites: INB270 or ITB003  
Credit points: 12  
Contact hours: 3 per week  
Campus: Gardens Point  
Teaching period: 2011 SEM-1

INB371 DATA STRUCTURES AND ALGORITHMS
The purpose of this unit is to ensure that you have a sound knowledge of modern programming techniques and their use in providing medium-scale software solutions. This unit will teach you to decompose a problem and produce a modular solution to a programming task. The principles to analyse algorithms for efficiency will also be introduced. In addition, you will acquire the necessary skills for you to use the tools available in common development environments, such as Microsoft Visual Studio.

Prerequisites: INB270 or ITB003  
Antirequisites: ITB711, ITB702, INN371  
Credit points: 12  
Contact hours: 3 per week  
Campus: Gardens Point  
Teaching period: 2011 SEM-1

INB372 AGILE SOFTWARE DEVELOPMENT
This unit introduces you to the software development process. You will look at each of the major activities involved in developing a software system. You will also learn how to manage and control the software development process for a large project when a number of team members are involved in the development. This unit develops the professional practice of working on large software systems.

Prerequisites: INB370  
Antirequisites: INN372, ITB612, ITB712  
Assumed knowledge: Good programming, debugging, testing and software development skills.  
Credit points: 12  
Contact hours: 3 per week  
Campus: Gardens Point  
Teaching period: 2011 SEM-2

INB373 WEB APPLICATION DEVELOPMENT
This unit will provide you with an understanding of the issues, structure and technologies used for developing web-based systems. The unit will provide you with the theoretical and practical skills needed to develop enterprise critical applications designed with an n-tier architecture using state of the art technologies. A comparative technology approach is taken, including an analysis of how web technologies have evolved to date, in order to identify common themes and to better enable you to comprehend and critically evaluate future web technology offerings.

Prerequisites: INB271 or ITB007  
Antirequisites: INN271, INN373  
Equivalents: ITB716 and ITN716  
Credit points: 12  
Contact hours: 3 per week  
Campus:
INB374 ENTERPRISE SOFTWARE ARCHITECTURE
This unit aims to introduce you to the field of enterprise architecture. It attempts to give you a grounding in the basic knowledge and skills required by an enterprise architect. This includes a solid understanding of the IT challenges currently facing medium to large size organizations, the theory and technologies currently used to address them and an appreciation of the business imperative for which they are utilized.

Prerequisites: INB270 or ITB003    Equivalents: ITB717
Credit points: 12    Contact hours: 3 per week    Campus: Gardens Point    Teaching period: 2011 SEM-1

INB381 MODELLING AND ANIMATION TECHNIQUES
The development of computer graphics tools is a significant application within the IT, Games and related industries, relying heavily on software engineering methodologies. These tools, such as CAD systems, 3D modelling systems and games engines, are used in such industries as advertising, engineering, manufacturing, simulation for education and training, computer games, film special effects, etc. Modelling techniques are intrinsic to a 3D graphics system, especially one used for real time animation. With increased CPU and GPU power, the ability to animate in real time is allowing more sophisticated interaction and the merger of games/simulation and film. The unit will provide you with the knowledge and skills to use an industry standard graphics API to implement graphics applications and to develop a basic real time animation system using an industry standard language.

Prerequisites: INB371 and MAB281    Equivalents: ITB746
Credit points: 12    Contact hours: 3 per week    Campus: Gardens Point    Teaching period: 2011 SEM-2

INB382 REAL TIME RENDERING TECHNIQUES
This unit will provide you with knowledge and skills in basic to advanced techniques in real-time rendering using shading languages. You will be able to implement a high-quality real-time rendering system in an industry standard API.

Prerequisites: INB371, INB381 and MAB281    Antirequisites: ITB648 and ITB649    Equivalents: ITB747
Credit points: 12    Contact hours: 3 per week    Campus: Gardens Point    Teaching period: 2011 SEM-1

INB385 MULTIMEDIA SYSTEMS
This unit will explore the concepts underpinning multimedia systems and the role played by these technologies in the overall knowledge of a computer professional. You will learn to: design and develop different kinds of interactive multimedia applications; understand the bank of knowledge in cultural developments surrounding the emergence of multimedia technologies; analyse design and processes that contribute to the production of a creative work, using contemporary hardware and software technologies; develop the creative potential of temporal media forms and their placement and use within new media works; understand principles and conventions associated with the interpretation and production of meaning through interactive visual representation.

Prerequisites: INB103 or ITB002    Antirequisites: ITB257
Credit points: 12    Contact hours: 3 per week    Campus: Gardens Point    Teaching period: 2011 SEM-1

INB386 ADVANCED MULTIMEDIA SYSTEMS
This advanced level unit will give you high level design and development skills in some of the current and emerging areas of the new media. Web delivered applications, stand-alone systems and installations will be included. It will endeavour to give you an in-depth understanding of interactive Multimedia Systems. You will be given the theoretical basis and practical skills to motivate you in the design and creation of a state-of-the-art system in this discipline. In the process it will encourage a professional team approach appropriate to the industry environment.

Prerequisites: INB385 (Special considerations may apply)    Equivalents: ITB259, ITN259
Credit points: 12    Contact hours: 3 per week    Campus: Gardens Point    Teaching period: 2011 SEM-2

INB860 COMPUTATIONAL INTELLIGENCE FOR CONTROL AND EMBEDDED SYSTEMS
This is a specialisation unit in the area of Infomechatronics that introduces five methods from the field of computational intelligence and relates them to applications on real time control and embedded systems. The methods are: Knowledge Base Systems, Fuzzy Control, Neural Networks, Reinforcement Learning and Evolutionary Computation. The unit is also intended to teach the specific design and programming skills that will enable you to solve problems using computational intelligence methods in real-time embedded systems. It is assumed that you already have knowledge of programming.

Assumed knowledge: Knowledge of a programming language like Python, Java or C is assumed.    Equivalents: ITB847
Credit points: 12    Contact hours: 3 per week    Campus: Gardens Point    Teaching period: 2011 SEM-1

MAB125 FOUNDATIONS OF ENGINEERING MATHEMATICS
A sound understanding of the language and techniques of mathematics is essential for any quantitative discipline. This unit provides an introduction to the aspects of mathematics especially applicable to engineering and is directed at those students whose mathematics preparation does not include Maths C or an equivalent. For this purpose, it's located in first semester of the first year of your course. This unit introduces you to the fundamental mathematical ideas of function, calculus, vectors and matrices, through the use of contextualised engineering related problems. In solving these problems you will develop both an understanding of the mathematical concepts and competency in appropriate solution methods.

**Antirequisites:** MAN120  
**Assumed knowledge:** Grade of at least Sound Achievement in Senior Mathematics B (or equivalent) or MAB105 is assumed knowledge  
**Equivalents:** MAB100, MAB120, MAB180  
**Credit points:** 12  
**Contact hours:** 4 per week  
**Campus:** Gardens Point  
**Teaching period:** 2011 SEM-1, 2011 SEM-2 and 2011 SUM

**MAB126 MATHEMATICS FOR ENGINEERING 1**

Building upon the foundations established in MAB125 or Senior Maths C, this unit addresses the significant role of mathematical modelling using differential equations for the description and resolution of simple and complex problems relevant to the discipline of engineering. The formulation and solution of such problems is supported by appropriate advanced mathematical concepts used for function approximation, differentiation and integration. The unit is located in first year for application in core engineering units throughout the rest of the course. Undertaking this unit will allow you to develop your problem solving skills, especially in the context of mathematical techniques applied to ordinary differential equations used to model engineering relevant problems.  

**Antirequisites:** MAN121  
**Assumed knowledge:** Grade of at least Sound Achievement in Senior Mathematics C (or equivalent) or MAB125 or MAB180 or MAB120 is assumed knowledge  
**Equivalents:** MAB111, MAB121, MAB131, MAB182  
**Credit points:** 12  
**Contact hours:** 4 per week  
**Campus:** Gardens Point  
**Teaching period:** 2011 SEM-1, 2011 SEM-2 and 2011 SUM

**MAB127 MATHEMATICS FOR ENGINEERING 2**

Building upon the foundations established in MAB125 or Senior Maths C, this unit addresses the significant role of mathematical modelling using vectors, matrices and multivariable calculus for the description and resolution of simple and complex problems relevant to the discipline of engineering. The formulation and solution of such problems is supported by appropriate advanced mathematical concepts used for function approximation, differentiation and integration. You will complete this unit in first year or first semester of second year depending on your initial maths background. Undertaking this unit will allow you to develop your problem solving skills, especially in the context of advanced mathematical techniques applied to vectors and matrices used to model engineering relevant problems.  

**Assumed knowledge:** Grade of at least Sound Achievement in Senior Mathematics C (or equivalent) or MAB125 or MAB120 or MAB131 or MAB182 is assumed knowledge  
**Equivalents:** MAB112, MAB122, MAB132  
**Credit points:** 12  
**Contact hours:** 4 per week  
**Campus:** Gardens Point  
**Teaching period:** 2009 SEM-1, 2009 SEM-2 and 2011 SUM

**MAB131 ENGINEERING MATHEMATICS 1A**

This unit includes the following: trigonometry, complex numbers, differentiation with applications, integration with applications, matrices, linear systems and vector algebra. Students must have completed at least four semesters of both Senior Mathematics B and C with an exit level of Sound Achievement (or equivalent).  

**Prerequisite(s):** At least SA in both Senior Mathematics B and Senior Mathematics C or MAB100  
**Credit points:** 12  
**Contact hours:** 4 per week  
**Campus:** Gardens Point  
**Teaching period:** 2009 SEM-1  
**Incompatible with:** MAB180

**MAB132 ENGINEERING MATHEMATICS 2A**

This unit includes the following: vector calculus; differentiation of vectors; velocity and acceleration; relative velocity; vector algebra; equivalent systems of forces; functions of several variables; partial derivatives; hyperbolic functions; inverse functions; inverse trigonometric and hyperbolic functions; partial derivatives; numerical methods; differential equations; multiple integrals; areas and volumes; Laplace transforms; Fourier series.  

**Prerequisite(s):** MAB131  
**Credit points:** 12  
**Contact hours:** 4 per week  
**Campus:** Gardens Point  
**Teaching period:** 2009 SEM-2  
**Incompatible with:** MAB182

**MAB180 ENGINEERING MATHEMATICS 1B**

This unit includes: sine and cosine functions; logarithmic functions; exponential functions; complex numbers; determinants; vector algebra in 2 and 3 dimensions; derivatives and their applications (differentiation, chain rule, higher derivatives); integrals and their applications. Students must have completed four semesters of Senior Mathematics B with an exit level of Sound Achievement, or have passed MAB105 (or equivalent). Incompatible with MAB131. Students with an exit level of High Achievement or better in Senior Mathematics C are advised to take MAB131.  

**Prerequisite(s):** At least SA in Senior Mathematics B (four semesters) or equivalent or MAB105  
**Credit points:** 12  
**Contact hours:** 4 per week  
**Campus:** Gardens Point  
**Teaching period:** 2009 SEM-1 and 2009 SEM-2  
**Incompatible with:** MAB131, HA in Senior Mathematics C
MAB182 ENGINEERING MATHEMATICS 2B
Prerequisite(s): MAB180
Credit points: 12
Contact hours: 4 per week
Campus: Gardens Point
Teaching period: 2009 SEM-1, 2009 SEM-2 and 2009 SUM
Incompatible with: MAB112, MAB132

MAB233 ENGINEERING MATHEMATICS 3
This unit will provide you with the foundation knowledge and skills to carry out a statistical data investigation including defining the problem, planning the investigation, collecting and analysing data, and reporting conclusions in context. It will also provide you with foundation knowledge and concepts of probability, random variables and distributions for further learning in engineering.
Prerequisites: MAB131 or MAB182 or MAB121 or MAB126 or MAB127
Antirequisites: BSB123, MAB101, MAN101
Credit points: 12
Contact hours: 4 per week
Campus: Gardens Point
Teaching period: 2011 SEM-1 and 2011 SEM-2

PCB136 ENGINEERING PHYSICS 1C
This introductory unit covers: dynamics (motion in 1D, vectors, Newton's Laws, motion in 2D (including circular motion), uniform circular motion, work, energy and power potential energy and conservation of energy, linear momentum and collisions); waves (oscillatory motion, wave motion, sound waves, superposition and standing waves); geometrical optics (reflection, refraction, dispersion, Huygens' principle, image formation by mirrors and lenses, optical instruments); physical optics (interference of light, diffraction); thermal physics (temperature, thermometry, thermal expansion, heat and thermal energy, heat capacity and specific heat, latent heat, heat transfer).
Credit points: 12
Contact hours: 4 per week
Campus: Gardens Point
Teaching period: 2009 SEM-1 and 2009 SEM-2