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

Year offered: 2010
Admissions: Yes
CRICOS code: 006384G
Course duration (full-time): 5 years
Domestic fees (indicative): 2010: CSP $3,200 (indicative) per semester
International Fees (indicative): 2010: $11,500 (indicative) per semester
Domestic Entry: February
International Entry: February
QTAC code: 419512
Past rank cut-off: 79
Past OP cut-off: 11
OP Guarantee: Yes
Assumed knowledge: English (4,SA) and Maths B (4,SA)
Preparatory studies: For information on acquiring assumed knowledge visit http://www.studentservices.qut.edu.au/apply/ug/info/knowledge.jsp
Total credit points: 480
Course coordinator: Dr R.Mahalinga-Iyer (Engineering), Mr Richard Thomas (Science & Technology)
Discipline coordinator: Dr Jasmine Banks (Engineering), Mr Richard Thomas (Information Technology Major)
Campus: Gardens Point

Course Description
This degree equips you to build and apply creative, innovative IT solutions across diverse industries. A hands-on, real world based curriculum gives you the opportunity to explore a wide range of areas within the two strands of this degree, and gain deep understanding within your chosen area speciality, such as networking, software engineering, data warehousing, business process modelling, enterprise systems, information management, web technologies, or digital societies. You will experience an innovative, hands-on approach to learning through projects where you develop IT systems. You will be able to gain entrepreneurial skills if you wish to learn how to develop an idea into a commercial opportunity. You learn to harness your creativity and people skills to maximise the impact of your technical know-how in the booming IT marketplace. It positions you for a challenging and rewarding career within the global economy. Full-time students are eligible for the Cooperative Education Program; paid industry work experience with credit towards your degree. Students are also offered many other work-integrated learning opportunities where you receive first-hand industry experience.

The engineering component consists of studies in electronic systems engineering while the information technology component concentrates on software engineering. These studies integrate into a cohesive course which gives a wide and advanced study of modern electronic and computing systems. This double degree produces computer and electronic engineers especially suited for the development and application of electronic and computer systems in all areas of industry.

Special Course Requirements
A candidate for the degree of Bachelor of Engineering (Electronics)/Bachelor of Information Technology must obtain at least 60 days of industrial experience in an engineering environment as part of the Work Integrated Learning unit.

International Students
English language requirements
In addition to the above academic entry requirements, international students must meet the University's English language requirements of IELTS of 6.5 (with no lower than 6.0 for any one band).

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).

Career Outcomes
Many graduates find employment in government instrumentalities such as communications, railways, electricity supply, hospitals, transport and in private organisations that are using electronics, electronic systems, computers and microprocessors to monitor, control, communicate and optimise processes and production.

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.

Recommended Study
Chemistry, Maths C and Physics.

The QUT Entry Bonus Scheme applies to students completing Year 12 or equivalent in 2009 and applying for entry in 2010.

QUT will award two bonus QTAC ranks for students who successfully complete Engineering Technology, Maths C or LOTE (Language Other Than English) in secondary school and apply to start a Bachelor of Engineering at QUT in 2010.

Professional Recognition
This degree meets the requirements for membership of Engineers Australia. Graduates of the Bachelor of Information Technology component meet the knowledge requirements for admission to the Australian Computer Society (ACS).

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 their Honours 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
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.

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 2010

<table>
<thead>
<tr>
<th>Year 1, Semester 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENB100</td>
</tr>
<tr>
<td>OR</td>
</tr>
<tr>
<td>INB103</td>
</tr>
<tr>
<td>ENB120</td>
</tr>
<tr>
<td>INB104</td>
</tr>
<tr>
<td>MAB125</td>
</tr>
<tr>
<td>OR</td>
</tr>
<tr>
<td>MAB126</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year 1, Semester 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENB130</td>
</tr>
<tr>
<td>ENB200</td>
</tr>
<tr>
<td>INB102</td>
</tr>
<tr>
<td>MAB126</td>
</tr>
<tr>
<td>OR</td>
</tr>
<tr>
<td>MAB127</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year 2, Semester 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENB240</td>
</tr>
<tr>
<td>ENB246</td>
</tr>
<tr>
<td>OR</td>
</tr>
<tr>
<td>INB101</td>
</tr>
<tr>
<td>ENB250</td>
</tr>
<tr>
<td>MAB127</td>
</tr>
<tr>
<td>OR</td>
</tr>
<tr>
<td>MAB233</td>
</tr>
</tbody>
</table>

| Year 2, Semester 2 |
ENB150  Introducing Engineering Design
ENB242  Introduction To Telecommunications
ENB243  Linear Circuits and Systems
IT Breadth Option Unit

Year 3, Semester 1
ENB110  Engineering Statics and Materials
ENB241  Software Systems Design
IT Breadth Option Unit
ENB243  Linear Circuits and Systems
IT Breadth Option Unit

Year 3, Semester 2
ENB244  Microprocessors and Digital Systems
ENB245  Introduction To Design and Professional Practice
ENB343  Fields, Transmission and Propagation
IT Breadth Option Unit

Year 4, Semester 1
ENB301  Instrumentation and Control
ENB340  Power Systems and Machines
ENB342  Signals, Systems and Transforms
INB201  Scalable Systems Development
ENB344  Industrial Electronics
ENB345  Advanced Design and Professional Practice
MAB233  Engineering Mathematics 3
OR
Electrical Engineering Selective
IT Specialist Option Unit

Year 4, Semester 2
Year 5, Semester 1
ENB346  Digital Communications
OR
ENB350  Real-time Computer-based Systems
BEB801  Project 1
OR
INB309-1  Major Project
INB301  The Business of IT
IT Specialist Option Unit

Electrical Engineering Selectives
ENB448  Signal Processing and Filtering
ENB452  Advanced Power Systems Analysis
ENB453  Power Equipment and Utilisation
ENB456  Energy
ENB457  Controls, Systems and Applications
ENB458  Modern Control Systems

Full-time Course structure – Students commencing in 2009
Year 1, Semester 1
BEB100  Introducing Professional Learning
OR
INB103  Industry Insights
INB104  Building IT Systems
MAB131  Engineering Mathematics 1A
OR
MAB180  Engineering Mathematics 1B
PCB136  Engineering Physics 1C
Year 1, Semester 2
ENB101  Engineering Mechanics 1
ENB104  Engineering Materials
ENB240  Introduction To Electronics
ENB242  Introduction To Telecommunications
Year 2, Semester 1
ENB101  Engineering Mechanics 1
ENB104  Engineering Materials
ENB240  Introduction To Electronics
ENB242  Introduction To Telecommunications
Year 2, Semester 2
ENB243  Linear Circuits and Systems
INB101  Impact of IT
INB270  Programming
IT Breadth Option Unit
Year 3, Semester 1
ENB340 Power Systems and Machines
ENB342 Signals, Systems and Transforms
MAB233 Engineering Mathematics 3
   IT Breadth Option Unit

Year 3, Semester 2
ENB241 Software Systems Design
ENB244 Microprocessors and Digital Systems
ENB245 Introduction To Design and Professional Practice
   IT Breadth Option Unit

Year 4, Semester 1
ENB301 Instrumentation and Control
ENB350 Real-time Computer-based Systems
INB201 Scalable Systems Development
   IT Specialist Option Unit

Year 4, Semester 2
ENB343 Fields, Transmission and Propagation
ENB344 Industrial Electronics
ENB345 Advanced Design and Professional Practice
ENB346 Digital Communications

Year 5, Semester 1
BEB701 Work Integrated Learning 1
BEB801 Project 1
   OR
INB309-1 Major Project
INB301 The Business of IT
   IT Specialist Option Unit

Year 5, Semester 2
BEB802 Project 2
   OR
INB309-2 Major Project
   IT Specialist Option Unit
   IT Specialist Option Unit
   Electrical Engineering Selective

Electrical Engineering Selectives
ENB231 Materials and Manufacturing 1
ENB334 Design For Manufacturing

ENB350 Real-time Computer-based Systems
ENB352 Communication Environments For Embedded Systems
ENB436 Mechatronics System Design
ENB440 RF and Applied Electromagnetics
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
ENB455 Power Electronics
ENB456 Energy
ENB457 Controls, Systems and Applications
ENB458 Modern Control Systems
INB353 Wireless and Mobile Networks
INB860 Computational Intelligence for Control and Embedded Systems

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 Systems Architecture
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.

INB101 Corporate Systems
INB102 Data Management and Security
INB103 Business Analysis
INB104 Business Intelligence
INB120 Corporate Systems
INB210 Databases
INB220 Business Analysis
INB250 Systems Architecture
INB251 Networks
INB255 Security
INB270 Programming
INB271 The Web
INB272 Interaction Design

Electrical Engineering Selectives
ENB231 Materials and Manufacturing 1
ENB334 Design For Manufacturing
UNIT SYNOPSISES

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).

Prerequisites: 192cp of completed studies Credit points: 12 Campus: Gardens Point Teaching period: 2010 SEM-1, 2010 SEM-2 and 2010 SUM

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).

Prerequisites: MAB126 or MAB131 or MAB180 Equivalents: EEB213 Credit points: 12 Contact hours: 4 per week Campus: Gardens Point Teaching period: 2010 SEM-2

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: CEB109 Credit points: 12 Contact hours: 4 per week Campus: Gardens Point Teaching period: 2010 SUM

ENB104 ENGINEERING MATERIALS
Atomic Bonding; Crystal Structure; Elastic Deformation; Elasticity Case Study; Plastic Deformation; Defects; Alloing 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: MAB131 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: 2010 SEM-1 and 2010 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: 2010 SEM-1 and 2010 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.

**Prerequisites:** ENB103 or ENB120

**Equivalents:** ENB104 or MAB126

**Assumed knowledge:** ENB110 is assumed knowledge.

**Credit points:** 12

**Contact hours:** 4 per week

**Campus:** Gardens Point

**Teaching period:** 2010 SEM-2

**ENB150 INTRODUCING ENGINEERING DESIGN**

Assumed knowledge: ENB110 is assumed knowledge.

Credit points: 12

Contact hours: 4 per week

Campus: Gardens Point

Teaching period: 2010 SEM-2

**ENB200 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

**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: 2010 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: 2010 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, requirement definition, software design, human-computer interaction, implementation, audits, and maintenance. Software design principles and techniques are presented as well as real-time system design. CASE development tools are briefly introduced as well as object oriented programming for which a structured Object Oriented Analysis and Design are considered.

Prerequisites: ENB246 or INB104

Equivalents: EEB612

Credit points: 12

Contact hours: 4 per week

Campus: Gardens Point

Teaching period: 2010 SEM-2

**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: 2010 SEM-1

**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: 2010 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:** 2010 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:** EE584  **Credit points:** 12  **Contact hours:** 4 per week  **Campus:** Gardens Point  **Teaching period:** 2010 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:** 2010 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

**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:** 2010 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:** 2010 SEM-2

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

**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  **Contact hours:** 4 per week  **Campus:** Gardens Point  **Teaching period:** 2010 SEM-1
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. Fri’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: 2010 SEM-1

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

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: 2010 SEM-2

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: 2010 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: EEB566 Credit points: 12 Contact hours: 4 per week Campus: Gardens Point Teaching period: 2010 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: 2010 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: 2010 SEM-1

ENB440 RF AND APPLIED ELECTROMAGNETICS
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.  
**Equivalents:** EEB961  
**Credit points:** 12  
**Contact hours:** 5 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 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:** 2010 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  
**Teaching period:** 2010 SEM-2

---

**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:** 2010 SEM-2

---

**ENB448 SIGNAL PROCESSING AND FILTERING**

This unit gives a comprehensive introduction to the representation and processing of signals distorted or corrupted by noise, and the systems needed to process them. Techniques for estimating signal parameters for the detection of signals in the presence of noise will be discussed. The methods presented will be tested on real data drawn from different engineering applications, such as wireless communications, biomedical EEG signals and brain models, speech and music synthesis, and radars.

**Prerequisites:** ENB342  
**Assumed knowledge:** MAB233 is assumed knowledge.  
**Equivalents:** EEB941  
**Credit points:** 12  
**Contact hours:** 4 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-2

---

**ENB452 ADVANCED POWER SYSTEMS ANALYSIS**

The aim of this unit is to introduce you to the basic topics of power system analysis relevant to engineers involved in both operations and planning. Specific tasks will be evaluation of faults on lines, load flow and stability analyses using commercial packages.

**Prerequisites:** ENB340  
**Assumed knowledge:** ENB301 is assumed knowledge.  
**Credit points:** 12  
**Contact hours:** 3 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-2

---

**ENB453 POWER EQUIPMENT AND UTILISATION**

The unit emphasises the use of relevant standards to the specification and design of electrical equipment for the use of electrical energy supply for buildings and lighting. Design approaches emphasise current engineering practise.

**Prerequisites:** ENB340  
**Credit points:** 12  
**Contact hours:** 4 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-2

---

**ENB454 POWER SYSTEM MANAGEMENT**

The aim of this subject is to develop skills in the operational management and the overall system management of Power systems. There are many decisions to be made in the context of imperfect information. This subject provides tools to provide a degree of structure to the decision process, whether at purchase time or in daily operation. These tools cover the areas of risk analysis, reliability and asset management and extend to the operational areas of utilization of equipment and quality of supply. The outcome is to achieve a balance between maintenance and capital purchases between investment and reliability.

**Prerequisites:** ENB340  
**Credit points:** 12  
**Contact hours:** 3 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-1
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:** 2010 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:** MAB126 or MAB180 or MAB131 are assumed knowledge.  **Equivalents:** EEB911  **Credit points:** 12  **Contact hours:** 3 per week  **Campus:** Gardens Point  **Teaching period:** 2010 SEM-2

ENB457 CONTROLS, SYSTEMS AND APPLICATIONS
Control systems are playing an increasingly important role in process control, energy management and utility management. This unit is concerned with the application of advanced control systems with an emphasis on physical architectures and implementations. Topics covered include control system actuators, sensors and controllers, control system architectures, human machine interfacing, adaptive control strategies and intelligent control.
**Prerequisites:** ENB301  **Credit points:** 12  **Contact hours:** 4 per week  **Campus:** Gardens Point  **Teaching period:** 2010 SEM-2

ENB458 MODERN CONTROL SYSTEMS
This unit introduces the student to the following concepts: Discrete time control systems and their design, state space 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:** 2010 SEM-1 and 2010 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:** ITB361, INN101  **Credit points:** 12  **Contact hours:** 3 per week  **Campus:** Gardens Point  **Teaching period:** 2010 SEM-1 and 2010 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.
**Antirequisites:** ITB005  **Credit points:** 12  **Contact hours:** 3 per week  **Campus:** Gardens Point  **Teaching period:** 2010 SEM-1 and 2010 SEM-2

INB103 INDUSTRY INSIGHTS
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:** ITB002  **Credit points:** 12  **Contact hours:** 3 per week  **Campus:** Gardens Point  **Teaching period:** 2010 SEM-1 and 2010 SEM-2
INB104 BUILDING IT SYSTEMS
This team-based unit is an integrated introduction to information technology designed to engage, inspire and inform and will demonstrate the important role that technical system design and development plays in achieving robust operation of a large variety of technological solutions. This unit will give you substantial hands-on, practical learning experiences and will motivate you through engagement in the creative, explorative and meaningful development of technological artefacts that operate in real world contexts.

**Prerequisites:** (INB102 or ITB005) and (INB104 or ITB001)  
**Assumed knowledge:** Completion of 36cp of Breadth units is assumed knowledge  
**Credit points:** 12  
**Contact hours:** 3 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-2

INB120 CORPORATE SYSTEMS
Corporate Systems Management is a growing area where people can make a difference to the way organisations and societies operate. In key business domains, such as Government, Health, Finance, Utilities and Primary Industries, Corporate Systems Managers play a vital role in directing the socio-technical systems that affect everyone's lives. This unit will help students to gain an overview of these major roles and key business domains in order to set the scene for their future studies and help them to match their emerging professional interests with potential career directions.

**Prerequisites:** ITB360  
**Credit points:** 12  
**Contact hours:** 3 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-1

INB123 PROJECT MANAGEMENT PRACTICE
Successful businesses use Project Management (PM) processes to structure the implementation, upgrades and process improvement activities undertaken within organisations. This unit investigates project management processes and analyses, combines and applies the basic elements and tools of successful projects to ICT cases. With a focus on contemporary organisations, the unit covers activities such as communication and risk management, change management, recording keeping and project reporting. The unit covers practical, relevant and topical PM issues delivered as a complex project activity.

**Prerequisites:** 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:** 2010 SEM-2

INB201 SCALABLE SYSTEMS DEVELOPMENT
TBA

**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

INB205 SPECIAL TOPIC 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.

**Prerequisites:** INB255, INB351 and INB365  
**Assumed knowledge:** Basic computer security knowledge, a good understanding of the use of Unix operating systems, computer networking and Programming experience (such as Python, C#, C, Java).  
**Other requisites:** Students must have completed 192 credit points towards their bachelor degree. Students must have a GPA of 5.5  
**Credit points:** 12  
**Contact hours:** 3 per week  
**Campus:** Gardens Point

INB210 DATABASES
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.
Assumed knowledge: Students are expected to have solid IT background knowledge (e.g., completion of at least 192 credit points)  
Equivalents: ITB004, ITB115  
Credit points: 12  
Contact hours: 3 per week  
Campus: Gardens Point  
Teaching period: 2010 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).

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

INB250 SYSTEMS ARCHITECTURE
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 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. Such techniques are especially important in the context of safety-, security- or mission-critical systems.

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).  
Credit points: 12  
Contact hours: 3 per week  
Campus: Gardens Point  
Teaching period: 2010 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.

Antirequisites: ITB006  
Credit points: 12  
Contact hours: 3 per week  
Campus: Gardens Point  
Teaching period: 2010 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.

Antirequisites: ITB161, ITB523, ITB623 and ITN161  
Equivalents: ITB730  
Credit points: 12  
Contact hours: 3 per week  
Campus: Gardens Point  
Teaching period: 2010 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: ITB003, ITB112, ITB411, INN270  
Credit points: 12  
Contact hours: 3 per week  
Campus: Gardens Point  
Teaching period: 2010 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 and basic skills in developing dynamic web applications, including an appreciation of the variety of implementation technologies available. Through an understanding of how web technologies have evolved to date, you will appreciate the necessity for lifelong learning and become an insightful predictor of future developments in this area. You will learn to critically analyse technological alternatives in order to adapt to and innovate with technologies that presently do not exist. You will appreciate the business or organizational context within which web applications exist and be skilled in communicating within that environment. You will appreciate the social and ethical issues relating to web based systems including accessibility, globalization, privacy, and piracy.

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: 2010 SEM-1

INB272 INTERACTION DESIGN
The aim of this unit is to provide you with an understanding of the theory, practices and challenges associated with the development of creative interactive design and human computer interaction.

Prerequisites: INB103 or INB181  Equivalents: ITB254
Credit points: 12  Contact hours: 3 per week  Campus: Gardens Point  Teaching period: 2010 SEM-2

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 planning and job applications, (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 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

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.

Credit points: 12  Contact hours: 3 per week  Campus: Gardens Point  Teaching period: 2010 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: 2010 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:** 2010 SEM-1, 2010 SEM-2 and 2010 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:** 2010 SEM-1, 2010 SEM-2 and 2010 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:** 2010 SEM-1, 2010 SEM-2 and 2010 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 and four Breadth option and one specialisation option units is assumed knowledge.  
**Equivalents:** ITB844  
**Credit points:** 12  
**Contact hours:** 3 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-1, 2010 SEM-2 and 2010 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.

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

### INB320 BUSINESS PROCESS MODELLING

The aim of this unit is to introduce you to modern methods and tools of business process management. These skills will be applied to the most complex, comprehensive and relevant IT applications. This unit also seeks to develop logical thinking 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:** 2010 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:** 2010 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.

**Equivalents:** ITB322  
**Credit points:** 12  
**Contact hours:** 3 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 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:** 2010 SEM-1

### INB341 SOFTWARE DEVELOPMENT WITH ORACLE

Oracle Corporation is the leading supplier of database software. 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: 2010 SEM-2

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: 2010 SEM-1

INB346 ENTERPRISE 2.0
This unit will help you to acquire the skills and knowledge required to critically explore and utilise applications within diverse contexts and organisations.

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

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: ITB264, ITB629, ITB720, ITN525, ITN667, ITN720 Credit points: 12 Contact hours: 3 per week Campus: Gardens Point Teaching period: 2010 SEM-1

INB351 COMPUTER 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: 2010 SEM-2

INB352 NETWORK PLANNING AND DEPLOYMENT
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      Credit points: 12      Contact hours: 3 per week  Campus: Gardens Point  Teaching period: 2010 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      Antirequisites: ITN723      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: 2010 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: 2010 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      Antirequisites: INN365, ITB745, ITB706      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: 2010 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 or INN270      Credit points: 12      Contact hours: 3 per week  Campus: Gardens Point  Teaching period: 2010 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: 2010 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:** 2010 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:** INN373  
**Equivalents:** ITB716 and ITN716  
**Credit points:** 12  
**Contact hours:** 3 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-2

**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:** 2010 SEM-2

**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:** 2010 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:** 2010 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.

**Antirequisites:** ITB847  
**Credit points:** 12  
**Contact hours:** 3 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-1

**MAB125 FOUNDATIONS OF ENGINEERING MATHEMATICS**

This unit introduces and reviews the elementary concepts of function, calculus, matrices and vectors with special reference to engineering related problems where appropriate. Topics covered include the algebra of complex numbers, elementary functions 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, MAB120, MAB180

**MAB126 MATHEMATICS FOR ENGINEERING 1**

This unit extends the areas of function and calculus introduced in MAB125 by introducing series representations for functions and more advanced methods of differentiation and integration for functions of one variable. A strong connection to engineering related problems is made by introducing the use of differential equations in modelling, and exploring appropriate methods of solution, including the use of Fourier series and Laplace Transform methods. Practical calculations of volumes and surface areas of solids of revolution extend your interpretations of the definite integral. Taylor and Fourier series are introduced as a means of approximating functions by sums of polynomials and periodic functions.

**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:** 2010 SEM-1, 2010 SEM-2 and 2010 SUM

**MAB127 MATHEMATICS FOR ENGINEERING 2**

This unit extends the areas of function, calculus, matrices and vectors introduced in MAB125 by introducing functions of more than one variable, partial derivatives and multiple integrals, vector valued functions, and matrix methods for the solution of systems of ordinary differential equations. Each of these topics is realised by contextualised engineering related 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:** 2010 SEM-1, 2010 SEM-2 and 2010 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 2B**

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 3**


**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 is mostly introductory statistics for engineering but also includes a small component on foundations of computational mathematics. Statistics includes: the planning, execution, analysis and reporting of data investigations; use of a statistical package; modelling data; relationships between variables; estimation; confidence intervals; tolerance limits; hypothesis testing; fitting and
investigating relationships; regression; design and analysis of experiments; risk; random variables; special distributions; linear combinations of correlated variables; reliability. The introduction to computational mathematics includes: function approximation; polynomial interpolation; numerical solution of ordinary differential equations.

**Prerequisites:** MAB131 or MAB182 or MAB121 or MAB126 or MAB127  
**Antirequisites:** BSB123  
**Credit points:** 12  
**Contact hours:** 4 per week  
**Campus:** Gardens Point  
**Teaching period:** 2010 SEM-1

**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