INFORMATICS SUBJECT DESCRIPTIONS

BIST400   **Internet Science & Technology IV**   **48cp**
               Honours

Annual   Wollongong   On Campus

Contact Hours: Refer Faculty

Prerequisites: Candidates who achieve a credit average or better in the Bachelor of Internet Science & Technology are eligible to enrol in an additional year of study towards a Bachelor of Internet Science and Technology (Honours).

Asessment: Refer Faculty

Subject Description: This Honours subject offers students the opportunity to study at an advanced level in areas of Internet Science and Technology. This subject will take advantage of specific knowledge and expertise within the Faculty. Students will acquire skills in communication and research methodology, as well as developing expertise in their chosen field of specialisation.

CSCI102   **Systems**   **6cp**

Spring   Wollongong   On Campus
Spring   Shoalhaven   On Campus
Spring   Batemans Bay   On Campus
Spring   Bega/ Moss Vale   On Campus

Contact Hours: 4 hours per week

Assessment: Workshop Reports 10%; Assignments 40%; Exam 50%.

Subject Description: CSCI102 establishes the position of Computer Science and Information Technology in a non-programming context. Areas introduced include Human-Computer Interface, Information Modelling, Intelligent Systems, Networks, Operating Systems, Software Design and Development and Professional ethics, rights and responsibilities.

CSCI103   **Algorithms and Problem Solving**   **6cp**

Autumn /Spring   Wollongong   On Campus
Autumn   Shoalhaven   On Campus
Autumn   Batemans Bay   On Campus
Autumn   Bega/ Moss Vale   On Campus

Contact Hours: 4 hrs lecture; 2 hrs laboratory/tutorial per week

Asessment: Assignments (40%) Examinations (60%)

Subject Description: CSCI103 introduces the basic concepts of algorithms and their relationship to data structures and problem solving. This subject emphasises problem solving techniques leading to the development of algorithms rather than their implementation or a formal mathematical treatment of algorithms. Topics include sorting, searching and counting problems and the principal algorithms used in their solution. Common approaches to algorithm development and analysis will be examined.

CSCI112   **Fundamentals of Computer Science**   **6cp**

Spring   Wollongong   On Campus

Contact Hours: 4 hours per week

Pre-requisites: CSCI111 or CSCI114

Assessment: 6 Assignments - 40%; Final Examination - 60%

Subject Description: The concepts of algorithms and computability together with techniques for analysis of the efficiency and complexity of algorithms are studied. Logical formalisms and their application in computing environments and the use of logical reasoning in establishing the correctness of implementations of algorithms are discussed. The abstract models such as finite state machines, pushdown automata and Turing machines are treated.

CSCI114   **Procedural Programming**   **6cp**

Autumn /Spring   Wollongong   On Campus
Autumn   Shoalhaven   On Campus
Autumn   Batemans Bay   On Campus
Autumn   Bega/ Moss Vale   On Campus
Autumn   Loftus   On Campus

Contact Hours: 4 hrs lecture; 2 hrs laboratory/tutorial per week

Asessment: Assignments (40%) Examinations (60%)

Subject Description: CSCI114 introduces the procedural approach to program design and implementation. Covers basic language constructs for defining variables of built-in types, flow control constructs and simple I/O. Explores functional decomposition as a design technique, and the implementation of functions. Introduces simple user-defined data types and aggregates.

CSCI121   **Computer Science 1B**   **6cp**

Spring   Wollongong   On Campus
Spring   Shoalhaven   On Campus
Spring   Batemans Bay   On Campus
Spring   Bega/ Moss Vale   On Campus

Contact Hours: 6 hours per week

Pre-requisites: CSCI111 or CSCI114

Restrictions: Note BUSS111 will NOT equip you for this subject's content

Assessment: Exam - 60%; Assignment - 40%

Subject Description: CSCI121 develops skills in object-based program design and implementation. Covers characterisation of abstract data types and their realisation as classes. Explores standard data types including lists, binary trees, queues.

Investigates implementation and efficiency of standard searching and sorting algorithms. Provides experience in the use of dynamic data structures.

CSCI124   **Object Programming**   **6cp**

Spring   Wollongong   On Campus

Contact Hours: 4 hrs lecture; 2 hrs laboratory/tutorial per week.

Prerequisites: CSCI111 or CSCI124 and CSCI103

Asessment: Exam 60%; Assignment 40%

Subject Description: CSCI124 develops skills in object-oriented program design and implementation. Covers characterisation of abstract data types and their realisation as classes. Explores the implementation of standard data types including lists, binary trees, queues. Investigates implementation of standard searching and sorting algorithms. Provides experience in the use of dynamic data structures.

CSCI203   Algorithms and Data Structures   6cp

Autumn   Wollongong   On Campus

Contact Hours: 3 hrs Lecture, 2 hrs Computer Lab per week.

Pre-requisites: CSCI121 or CSCI124

Assessment: Assignment 40%; Exam 60%

Subject Description: Approaches to analysing algorithm complexity, introduced in first year subjects, will be reviewed. The complexity class of algorithms will be introduced as one of the major consideration in problem analysis and program design. The use of abstract data types as a design technique, and their implementation in solutions to problems, will form a part of the practical work. Code will be implemented in the form of reusable C++ classes and/or C modules.

CSCI204   The C Family and Unix   6cp

Autumn / Spring   Wollongong   On Campus

Contact Hours: 6 hours per week

Pre-requisites: CSCI121 or CSCI 124

Assessment: Laboratory Assignments- 40%; Final Examination - 60%

Subject Description: Students will be introduced to the C programming language and the UNIX operating system. Particular attention will be paid to the differences that exist between C and C++ and ways in which C++ constructs can be implemented in C. The tools available in the UNIX environment for program development and maintenance will be covered plus the methods of interfacing code to operating system functions, and libraries such as the C++ Standard Template Library.

CSCI205   Development Methods & Tools   6cp

Spring   Wollongong   On Campus

Contact Hours: 5 hours per week

Pre-requisites: CSCI121

Assessment: Examination - 50%; Assignment - 50%

Subject Description: To provide students with practical skills and knowledge of systems analysis and design techniques. Students will be given instruction in a particular, standard analysis and design method. The techniques and phases of the selected method will be treated thoroughly and in detail. The instruction will utilise case studies, and it will be supported by Computer Aided Software Engineering (CASE) technology. In addition to individual learning, students will be introduced to group analysis and design activities.

CSCI212   Interacting Systems   6cp

Autumn   Wollongong   On Campus

Contact Hours: 5 hours per week

Pre-requisites: CSCI131 or CSCI121

Assessment: Assignments - 40%; Final Exam - 60%

Subject Description: This subject examines the relationships between the program and its environment: with the user via a consideration of HCI and graphical interfaces; with the computer via the operating system; with data via the file system and with other programs via the network.

CSCI213   Java Programming & the Internet   6cp

Autumn / Spring   Wollongong   On Campus

Contact Hours: 3 hours Lectures, 2 hours Labs per week.

Pre-requisites: CSCI121 or CSCI124

Assessment: Assignments - 50%; Exams - 50%

Subject Description: This subject provides: 1. an introduction to the Java language and some of its standard class libraries; 2. experience with object oriented design and implementation techniques; 3. an understanding of the Internet and its importance to modern software systems. Topics will include: Java language, subset of Java class libraries (windowing, graphics, networking, threads), object oriented design and implementation, Internet issues, basics of TCP/IP protocols, Web technologies, HTML and Javascript, CGI programming, introduction to security issues.

CSCI214   Distributed Systems   6cp

Spring   Wollongong   On Campus

Contact Hours: 4 hours per week.

Pre-requisites: CSCI121

Assessment: Assignments - 40%; Exam - 60%

Subject Description: CSCI214 introduces basic concepts of internetworking and distributed systems. Physical communications media are introduced, then the focus shifts to network protocols (TCP/IP), then client-server model and the sockets interface. Other topics to be covered include network addressing and security (firewalls). Real-world programming examples from Unix and Windows-NT environments will be presented. Students will undertake laboratory exercises on Linux-based PCs.

CSCI222   Systems Development   6cp

Not on offer in 2004

Prerequisites: CSCI102 and (CSCI124 or CSCI121)

Asessment: Assignments 40% Final Exam 60%

Subject Description: CSCI222 provides a framework for understanding and developing the necessary skills to successfully undertake the major third year software project. The emphasis of this subject is on the design and development process and its application to real world problems. The subject combines a formal introduction to the discipline of software engineering with a practical application of its methods.

CSCI235   Databases   6cp

Spring   Wollongong   On Campus

Contact Hours: 3 hours Lecture, 2 hours Computer Lab per week.

Pre-requisites: CSCI121

Assessment: Assignments 25%; Class tests 15%; Final Examination 60%.

Subject Description: This subject investigates three major areas of modern database systems: 1. design of relational databases; 2. programming of relational databases; 3. concurrency control and data recovery in database systems. Topics will include: Introduction to conceptual database modelling; Principles of relational database model; Structured Query Language (SQL) and its procedural extensions (PL/SQL, Embedded SQL, JDBC); Database server programming;

Normalization of relational databases; and Transaction management and recovery in database systems.

CSCI236   3D Modelling and Animation   6cp
Not on offer in 2004

Pre-requisites: 12 credit points of 200 level CSCI or IACT subjects

Exclusions: CSCI463

Assessment: 5 Laboratory Assignments - 40%; Final Examination - 60%

Subject Description: This subject provides students with a hands-on introduction to the use of computers for developing models of three-dimensional objects and viewing them in 3D as still images and animations. Topics covered include basic modelling primitives, from polygons to spline surfaces; tools to modify simple objects; surfacing concepts such as textures and bump maps; basic lighting of scenes; the animation process including key frames, articulated structures, camera movement and morphing; lighting effects such as volumetrics and radiosity. The subject uses the industry standard software package LightWave.

CSCI262   System Security   6cp
Spring   Wollongong   On Campus

Contact Hours: 3 hrs lecture, 1 hr tutorial per week.

Prerequisites: CSCI121 or CSCI124

Asessment: Assignments 40% Final examination 60%

Subject Description: The subject covers some fundamental computer security technologies in the following aspects: (1) Operating system security such as physical security, file protections, system abuses, attacks and protections; (2) Database security including data integrity, data recover, data encryption/ decryption, access control, and authentication; (3) Mobile code security including malicious logic, host and mobile code protection, mobile agents' security. (4) Intrusion detection; (5) Security policies; (6) Security management and risk analysis.

CSCI311   Software Process Management   6cp
Autumn   Wollongong   On Campus

Contact Hours: 4 hours per week.

Pre-requisites: CSCI205

Assessment: Assignments 50%; Examination 50%

Subject Description: Software development is a difficult and challenging task. Apart from the most trivial of problems, the software development process is generally a collaborative rather than an individual effort. To manage the development of complex software artifacts, various principles and practices of software engineering have been formulated. Acquainting students with the principles and practices of managing the software development process is the primary aim of this subject.

CSCI313   Professional Programming   6cp
            Practices
Not on offer in 2004

Pre-requisites: CSCI204

Assessment: Assignments 60%; Exam 40%

Subject Description: The aims of this subject are to assist students in refining their programming skills and to develop awareness of issues important to professional programmers.

The focus will be predominantly on programming in C++. Topics will include more advanced language features, tools, and libraries.

CSCI315   Database Design and Implementation   6cp
Autumn   Wollongong   On Campus

Contact Hours: 3 hrs lectures, 2 hrs lab class per week.

Pre-requisites: CSCI235

Assessment: 3 Assignments 30%; 2 class tests 20%; final examination 50%

Subject Description: This subject investigates the process of relational database design starting from conceptual database design, through logical database design up to and including physical database design, database tunning and administration. The topics will include conceptual database design based on Object Modelling Technique, methodologies for conceptual design, view integration, logical database design, database normalization and de-normalization, physical database design, generation of database applications, database tunning, design of distributed database systems.

CSCI317   Database Performance Tuning   6cp
Spring   Wollongong   On Campus

Contact Hours: 3 hrs lectures, 2 hrs lab class per week.

Prerequisites: CSCI235

Asessment: Assignments 20%; Tests 20%; Final exam 60%

Subject Description: The subject addresses the performance problems of relational database systems. In particular, it presents optimisation of query processing in relational database systems, performance tuning of database applications, transaction processing in database systems, optimisation of transaction processing, performance tuning of relational database servers, performance tuning of three tier database applications. Laboratory classes demonstrate the techniques used for elimination of performance problems in database systems. Oracle 9i database management system is used for demonstration purposes and all practical work in the subject.

CSCI321   Project   12cp
Annual   Wollongong   On Campus

Contact Hours: 1 hour lecture per week.

Pre-requisites: CSCI204 or CSCI213 and 18cp of 200 level IACT or CSCI subjects

Restrictions: Spring start is ONLY available to candidates who have 96cp of advance standing. As Web Enrolment is NOT possible for Spring start, see co-ordinators for details

Subject Description: Working in groups, students design, implement, and document a software system. Involves: project planning and scheduling, seminars and individual presentations, group coordination, research of proposed application domain, use of design methodologies, design documentation, coding, module and system integration, testing, verification, and implementation. A small number of project topics have been proposed. Students will form teams, each of which will design, implement and document a solution to one of the proposed projects. Teams will meet weekly with supervisors to discuss progress and problems.

CSCI322   Systems Administration   6cp

Spring   Wollongong   On Campus

Contact Hours: 4 hours per week

Pre-requisites: CSCI204 and 6 cp of 200-level CSCI subjects

Assessment: Assignments 40%; Final Examination 60%

Subject Description: This subject will cover the practical and theoretical aspects of system administration. The various resource areas which have to be managed will be discussed and examined, and the possible methods of monitoring and controlling them in various systems will be investigated. The features unique to both single processor and networked systems will be investigated.

CSCI323   Artificial Intelligence   6cp

Spring   Wollongong   On Campus

Contact Hours: 4 hours per week

Pre-requisites: CSCI202 or CSCI204 and 6cp of 200-level Computer Science subjects

Assessment: Final exam 60%, lab assignments 20%, project 20%

Subject Description: CSCI323 reviews the main components of Artificial Intelligence research including knowledge representation, reasoning, natural language understanding, and perception. Focuses on Expert Systems and the computational models they embody. Introduces the programming languages Lisp and Prolog.

CSCI324   Human Computer Interface   6cp

Spring   Wollongong   On Campus

Contact Hours: 3 hours per week

Pre-requisites: CSCI204 and 6cp 200 level CSCI subjects

Exclusions: not to count with IACT403

Assessment: Final Exam 40%; Assessment 60%

Subject Description: This subject examines the design evaluation and implementation of interactive computing systems for human use (HCI) and the major phenomena surrounding them. Also considered are joint performance of tasks by humans and machines, structure of human machine communication, social and organizational interactions with machine design, human capabilities to use machines including their learnability as well as algorithms and programming of the interface itself, engineering concerns that arise in designing interfaces, the process of specification design and implementation of interfaces and design tradeoffs.

**CSCI325   Software Engineering Formal   6cp
            Methods**

Autumn   Wollongong   On Campus

Contact Hours: 3 hours lectures per week

Pre-requisites: CSCI204

Co-requisites: CSCI311

Assessment: Exercise 30%; Essay 20%; Final Examination 50%

Subject Description: This subject introduces students to formal methods for software specification. The role of formal methods in the software development process is explained, and it is illustrated with case studies of the industrial application of formal methods. The subject uses the Z notation as an example of a formal specification technique, and software tools for the manipulation of Z specifications are introduced. Case studies in the application of formal methods to safety-critical and real-time software systems are presented.

CSCI333   Compilers   6cp

Not on offer in 2004

Pre-requisites: CSCI337

Subject Description: CSCI333 introduces the theories and practices of compiler and interpreter construction. Covers: lexical analysis, parsing, code generation, optimisation, symbol tables, and error detection.

**CSCI334   Interfacing and Real Time   6cp
            Programming**

Spring   Wollongong   On Campus

Contact Hours: 3 hours Lectures, 1 hour Computer Lab per week.

Pre-requisites: CSCI121

Assessment: 5 Assignments @ 8% - 40%; Final Examination (3 hours) - 60%

Subject Description: The emphasis of this subject is on low-level interfacing of computer peripherals in high-level languages. Students will be required to complete a number of practical assignments. Topics to be covered will include: (a) IBM PC Programmer s model; (b) interrupt handling; (c) I/O registers; (d) data input, error detection and correction, filtering, storage and output; and (e) programmable chips for digital, serial, analog and disk I/O, graphics, memory management and real-time clocks. It should be noted that according to Course Rule 003 {Interpretation Point 2 (t)} each credit point for a single session subject has the value of about 2 hours per week including class attendance. Therefore, the amount of time spend on each 6 credit point subject should be at least 12 hours per week, which includes lectures/tutorials/labs etc.

CSCI336   Computer Graphics   6cp

Autumn   Wollongong   On Campus

Contact Hours: 3 hours per week

Pre-requisites: CSCI204 and 6cp of 200-level CSCI subjects

Assessment: Laboratory Assignments 5 @ 8%-40%; Final Examination - 60%

Subject Description: Introduction to computer representation of lines and points; mathematical models; transformations in 2 and 3 dimensions; homogenous coordinate systems; fill algorithms; solid modelling; hidden line and surface algorithms; lighting models; and current trends.

**CSCI337   Organisation of Programming   6cp
            Languages**

Spring   Wollongong   On Campus

Contact Hours: 3 hours Lectures, 1 hour Computer Lab per week.

Pre-requisites: CSCI121 or CSCI124

Subject Description: CSCI337 develops an understanding of major programming paradigms including imperative, functional, logical, object-oriented, and procedural paradigms. Introduces formal language specification. Covers language definition and syntax; data types and data structures, control structures and data flow; run-time considerations; and interpreted languages.

CSCI361   Computer Security   6cp

Autumn   Wollongong   On Campus

Contact Hours: 3 hours lectures, 1 hour labs per week.

Pre-requisites: CSCI204 and 6cp of 200-level CSCI subjects

Assessment: Final exam - 70%; Laboratory Work - 30%

Subject Description: CSCI361 develops the knowledge and skills necessary to identify the security problems that may occur in a distributed computer environment, and then to devise means for countering the threats. Covers: Identification: passwords, challenge-response protocols Private Key; Cryptography: classical ciphers, Feistel cryptosystems Public; Key Cryptography: RSA, Merkle-Hellman, El-Gamal, Elliptic-Curve cryptosystems; Hashing: Birthday paradox, serial and parallel hashing, MD family, keyed hashing; Digital Signatures: generic, RSA, El-Gamal, blind, undeniable, fail-stop; Key Establishment; Protocols: classical key transport, DH agreement, Kerberos, SPX, STS protocol, BAN logic Access; Control: MAC, DAC, RBAC, implementations of access control, security kernel, Multics, UNIX, capabilities, access control lists; Network Security: IPsec, viruses, web security, copyright protection .

CSCI365   CSCI Honours Preliminary Project   6cp

Not on offer in 2004

Subject Description: A supervised reading course for prospective Honours students. Under direction of a member of academic staff, students undertake a reading or small research project in an area of Computer Science not available by coursework. Introduction to research methodology.

CSCI368   Network Security   6cp

Spring   Wollongong   On Campus

Contact Hours: 2 hrs lecture per week.

Prerequisites: CSCI361

Asessment: Assignment 40%; Exam 60%

Subject Description: This subject provides a survey of network security technologies, and explores them in practice. This includes but is not limited to, network-based threats, security failure in cryptographic and network protocols, authentication servers, certificates and public-key infrastructures, security provisions in communication protocols and standards, electronic mail security, firewalls and intrusion detection systems.

CSCI370   Special Topics in Computing   6cp
Science A

Autumn   Wollongong   On Campus

Contact Hours:

Pre-requisites: 12 credit points of CSCI or IACT @ 200 level

Subject Description: Topics selected from the areas of interest of staff members or visiting faculty. Consult the head of school for details.

CSCI371   Special Topics in Computing   6cp
Science B

Not on offer in 2004

Subject Description: Topics selected from the areas of interest of staff members or visiting faculty. Consult the head of school for details.

CSCI372   Special Topics in Computing   6cp
Science C

Not on offer in 2003

Subject Description: Topics selected from the areas of interest of staff members or visiting faculty. Consult the head of school for details.

CSCI373   Special Topics in Computing   6cp
Science D

Not on offer in 2003

Subject Description: Topics selected from the areas of interest of staff members or visiting faculty. Consult the Head of School for details.

CSCI399   Server Technology   6cp

Autumn   Wollongong   On Campus

Contact Hours: 4 hours per week

Pre-requisites: 12cp at 200 level

Assessment: Assessment - 30%; Final Examination - 70%

Subject Description: This subject provides a broad overview of the computing technologies that underlie e-commerce. Technical topics will include: protocols, web server configuration (Apache), introduction to domain name services (DNS), the Perl language, PHP scripting, and the Java technologies: servlets, Java Server Pages, Java/XML technologies, and a limited introduction to Enterprise Java Beans and .NET. Additional topics may include web services, peer to peer computing models, and other emerging technologies.

CSCI401   Computing Science IV Honours   48cp

Annual   Wollongong   On Campus

Pre-requisites: Candidates who achieve a credit average or better in the Bachelor of Computer Science or a major in computer science in another degree, are eligible to enrol in an additional years study towards a Bachelor of Computer Science (Honours) (BCompSc(Hons)).

Subject Description: The program of study for BCompSc(Hons), i.e., CSCI401 Computer Science IV Honours will include: 1. a 18 credit point project; 2. 30 credit points of 400/900 level subjects from the Computer Science Schedule; 3. With the permission of the Head of School, candidates may substitute up to 12 credit points of subjects with 300 level subjects from the the Computer Science Schedule or 400 level subjects from another discipline; 4. Attendance at a series of seminars on research methodology (including quantitative and qualitative analysis). Seminars will cover the purpose of research, formulating a research question, conducting a literature review and writing a research proposal. Students will learn how to design an appropriate research plan. Requirements for scholarly writing will also be discussed and the process of undertaking a research project will be analysed. Individual results for subjects attempted will not be released. Instead, the final result for CSCI401 will be calculated from the total results for the project and subjects.

CSCI405   Computer Science Joint Honours   24cp

Annual   Wollongong   On Campus

Assessment: written examination, seminar and thesis.

Subject Description: The thesis is usually integrated with the other academic unit. The subject comprises one half of CSCI401. A topic for the thesis will be determined in

consultation with the other academic unit. See the Computer Science co-ordinator for advice.

CSCI407   Corba and Enterprise Java   6cp

Spring   Wollongong   On Campus

Contact Hours: 2 hours Lectures plus independent work in the computer laboratories

Pre-requisites: 24 cp @ 300 level CSCI subjects

Exclusions: CSCI407

Assessment: A series of assignments totalling 100% with no one assignment exceeding 50% in value.

Subject Description: This subject introduces students to the "enterprise level" computing environments - Corba, and Enterprise Java Beans. It will also provide a more limited overview of general "web services" and related technologies. The emphasis is practical with students developing Corba applications with Java clients and C++ servers, and later creating and deploying complete EJB systems.

CSCI408   Distributed Java   6cp

Not on offer in 2004

Pre-requisites: 24cp@ 300level CSCI subjects

Exclusions: CSCI908

Assessment: A series of assignments totalling 100% with no one assignment exceeding 50% in value.

Subject Description: This subject provides students with a strong grounding in distributed object systems, using the inter-related Java based RMI, Jini, Javaspaces, and JXTA technologies as illustrations. The content will include an exploration of how to "objectify" a client-server distributed system, a reasonably detailed study of Java Remote Method Invocation, exploration of the Jini technology with emphasis on applications such as Javaspaces distributed computing, and an introduction to the latest Java based peer-to-peer systems.

CSCI425   Topics in Software Engineering   6cp

Autumn   Wollongong   On Campus

Contact Hours: 2 hours per week

Pre-requisites: 24cp @300 level

Assessment: Project Planning & Requirement Specifications - 20%; Project Architecture & Design - 10%; Project Testing - 20%; Configuration Management - 10%; Final Exam - 40%.

Subject Description: This subject examines the current state of software engineering both as an academic discipline and as a profession. The subject focuses on issues of requirements engineering, system procurement, and professional practice, and through case studies, the subject considers reasons for the failure and success of various software engineering projects.

CSCI444   Perception and Planning   6cp

Spring   Wollongong   On Campus

Contact Hours: 2 hours Lectures per week.

Pre-requisites: 24cp @300 level

Assessment: Assignments 100%

Subject Description: This subject explores ways in which a robot can combine data from variety of sensors to create or update a model of its environment, and then use this model to infer the consequences of proposed actions. The subject will cover the use of internal sensors, such as those measuring odometry and location, and external sensors including those for touch, vision, and range finding.

CSCI445   Parallel Computing   6cp

Not on offer in 2004

Pre-requisites: 24cp @300 level

Assessment: Assignments - 40%; Exam - 60%

Subject Description: This subject presents different approaches to the construction of parallel algorithms and computer architectures. Both theoretical and practical aspects are covered, emphasis is placed on identifying the suitability of the approaches for specific applications.

CSCI446   Multimedia Studies   6cp

Autumn   Wollongong   On Campus

Contact Hours: 2hrs lecture, 1hr lab per week

Pre-requisites: 24cp @300 level

Assessment: Assignment 100%

Subject Description: This subject studies the creation and programming of digital media for multimedia applications. Multimedia systems combine images, graphics, sound and text to interactively communicate information. Each of these media has its own standards, algorithms and file formats. The foundations strand examines the principles of how media is created. The programming strand explores the programming of multimedia applications, using a multimedia applications such as QuickTime for Java. The practical strand explores the acquisition, encoding and editing of digital video and audio with professional tools, such as Final Cut Pro.

CSCI450   Software Requirements and   6cp
**   Specifications**

Spring   Wollongong   On Campus

Contact Hours: 2 Lectures hours per week

Pre-requisites: 24cp @ 300 level

Assessment: Assignments - 50%; Examination - 50%

Subject Description: Software development can be viewed as an activity in which useful things are built to serve recognisable purposes. For software developers, these "useful things" are a special kind of machine known as software systems, and the "purpose" of these machines is to help solve problems in some application domain. This subject emphasises the importance of understanding the application domains that software systems interact with and the problems we try to solve in these domains.

The subject focuses on writing explicit and precise descriptions known as: (1) Requirements - descriptions of application domains and the problems to be solved there; (2) Specifications - descriptions of the interface between the machine and the application domain. The subject addresses techniques used to record, elicit, and reason about these descriptions. The subject examines the approach to Requirements and Specification techniques taken by a range of systems engineering methodologies. The concepts of method engineering are introduced and the role of software tools to support this activity is discussed.

CSCI457   Advanced Topics in Database   6cp
**   Management Systems**

Spring   Wollongong   On Campus

Contact Hours: 3 hours per week

Pre-requisites: 24cp @300 level

Assessment: Implementation Project - 20%; Mini Research Project - 30%; Final Examination - 50%.

Subject Description: This subject covers two advanced topics from modern database management systems: object-oriented databases and transaction management in database systems. The topics include the details such as design and implementation of object-oriented database systems, hybrid transaction management, optimistic transaction management, nested transactions, management of long transactions, and management of transaction in distributed systems.

CSCI463   Advanced Computer Graphics   6cp
Not on offer in 2004

Pre-requisites: 24cp @ 300 level

Exclusions: Not to count with CSCI236

Assessment: Assignment - 60% Examination - 40% (form of assessment to be confirmed with class)

Subject Description: In this subject students will learn how to use graphics techniques such as ray tracing and radiosity to produce highly realistic images with features such as shadows, reflection, refraction, texturing, penumbras and motion blur. The rendering algorithms and their underlying mathematics are covered with a practical component being the implementation of a ray tracer. Applications including scientific visualisation are also covered.

CSCI464   Neural Computing   6cp

Autumn   Wollongong   On Campus

Contact Hours: 2 hours per week

Pre-requisites: 24 cp @ 300 level

Assessment: Exam - 60%; Assignment - 40%

Subject Description: This subject introduces students to the basics of "soft" computing. Primary focus will be on artificial neural networks, with some attention also given to genetic algorithms, (evolutionary computing), fuzzy logic and neurofuzzy expert systems. These approaches will be compared and contrasted with heuristic, ruus-based artificial intelligence methods, such as decision trees and case-based reasoning. Several application areas will be discussed, primarily pattern recognition and/or classification.

CSCI465   Design and Analysis of Algorithms   6cp
Not on offer in 2004

Pre-requisites: 24cp @ 300 level

Assessment: Assessment - 50%; Exam - 50%.

Subject Description: The objective of this subject is to develop the knowledge, skills and techniques for designing and analysing algorithms. Topics to be studied include: review of standard algorithm designs including divide and conquer, the greedy method, etc; complexity analysis and comparison of algorithms, number theoretical algorithms.

CSCI466   Coding for Secure Communication   6cp
Not on offer in 2004

Pre-requisites: 24cp @ 300 level

Assessment: Assignment - 50%; Exam - 50%

Subject Description: This subject provides a fundamental understanding of information protection and efficient coding strategies that can be used to ensure correctness, security and authenticity of data. It uses entropy as the universal measure of information to analyse and explore fundamental bounds on the performance of secure and reliable storage and communication systems, and examine a range of coding schemes that form the main building blocks of such systems. It will include the following topics: i) redundancy in data and compression algorithm; ii) efficient error control strategies for secure and reliable communication and storage systems; and iii) coding methods for secrecy and authenticity.

CSCI467   Complexity Theory   6cp
Not on offer in 2004

Pre-requisites: CSCI361

Co-requisites: CSCI471

Assessment: Assignment - 50%; Exam - 50%

Subject Description: The subject introduces basic concepts of complexity theory. Topics include NP-completeness and NP-hardness, Cook's theorem and its implications concepts of indistinguishability and pseudorandomness, interactive proof systems and zero-knowledge protocols.

CSCI471   Advanced Computer Security   6cp

Spring   Wollongong   On Campus

Contact Hours: 2 hours lecture per week.

Pre-requisites: 24cp @300 level

Assessment: Assessment - 50%;Exam - 50%

Subject Description: This subject provides a review of computer security. Topics include: digital signatures, elliptic curve cryptography, El Gamal public key methods, the Advanced Encryption Standard (AES), Security Standards, Security Evaluation Standards, Linear Cryptanalysis, Differential Cryptanalysis.

ECTE101   Electrical Engineering 1   6cp

Spring   Wollongong   On Campus

Contact Hours: 78 hours per session.

Co-requisites: MATH142 or MATH161 or MATH188.

Exclusions: ELEC101

Assessment: See Subject Information Sheet those presented here are only a guide. Assessment: Practical attendance and performance - 10%; Practical (Reports) - 15%; Tutorial Tests - 7.5%; Tutorial Assignments - 7.5%; Examination - 60%.

Subject Description: ECTE101 aims to provide students with an understanding of the behaviour of basic electrical devices and circuits and with an introduction to the mathematical models used in computer, electrical, internet and telecommunications engineering. It will provide an introduction to electrical quantities and measurements; circuit analysis; electronic devices and circuits; an introductory overview of the frequency spectrum used for communications; the use of modulation and broadcast mediums, e.g., television and radio; wireless technology; and fixed networks. The practical component will cover basic electrical measuring, recording and display instruments; characteristics and measurements of circuit elements, analogue and digital electronic circuits, simple communications circuits.

ECTE150   Engineering Design and   6cp
             Management 1

Autumn / Annual   Wollongong   On Campus

Contact Hours: 78 hours per session.

Exclusions: ELEC150

Assessment: See Subject Information Sheet those presented here are only a guide. Examination (Lecture Material) - 50%; Reports/Presentation(s) - 10%; Tutorial/Practical Assignments - 15%; Team Exercise - 25%.

Subject Description: The aim of ECTE150 is to provide students with an introduction to the communication, management and teamwork skills required of professional engineers. The subject will examine the role played by electrical engineers in society, their responsibility to the environment, and will show the importance of the professional code and ethics. Lectures will also examine and introduce management topics relevant to engineers. Laboratory activities will introduce basic measurement and computing skills.

ECTE181   WWW Engineering   6cp

Autumn   Wollongong   On Campus

Contact Hours: 78 hours per session.

Assessment: See Subject Information Sheet those presented here are only a guide. Final examination - 60%, Assignment - 25% and Practical - 15%.

Subject Description: The aim of this subject is to provide students with a practical introduction to the World Wide Web and to a variety of tools useful in engineering the WWW. Topics covered will include: embedded servers; relevant standards; multimedia content and formats in use on the WWW, for example, MPEG, JPEG and ZIP compression formats; practical applications of compression; and modular level engineering of Java programs.

ECTE182   Internet Technology 1   6cp

Spring   Wollongong   On Campus

Contact Hours: 2 hr Lecture, 1hr Tutorial, 3hr Practical per week.

Asessment: See Subject Information Sheet those presented here are only a guide. Final examination - 60%, assignment - 25% and practical - 15%.

Subject Description: This subject introduces students to the fundamentals of computer communications. These fundamentals are then used to outline the Internet Architecture, and describe its key components. Following this, the operation of the World Wide Web (WWW) will be detailed. Topics covered include packet switching, switched networks, layered protocols, Local and Wide Area networks, WWW operation, network components (e.g., routers), access technologies (e.g., modems). Laboratory exercises will illustrate key computer communications concepts.

ECTE195   Design and Management   6cp

Autumn   Wollongong   On Campus

Contact Hours: 71.5 hours per session.

Exclusions: ELEC150, ELEC195

Assessment: See Subject Information Sheet those presented here are only a guide. Examination (Lecture Material) - 30%; Tutorials - 30%; Seminars - 20%; Practical - 20%

Subject Description: This subject provides an introduction to the communication, management and team work skills necessary to implement typical IT projects for students in the BIST degree. It also seeks to provide students with communication and experimentation skills. Accompanying laboratory activities will introduce students to basic skills and concepts needed for internet performance measurements and monitoring.

ECTE202   Circuits and Systems   6cp

Annual   Wollongong   On Campus

Contact Hours: 65 hours per session.

Prerequisites: ECTE101 and (MATH142 or MATH162 or MATH188)

Co-requisites: MATH201 or MATH283

Exclusions: ELEC201, ELEC202

Assessment: See Subject Information Sheet those presented here are only a guide. Tutorial assignments - 20%; Tests - 10%; Final Examinations - 70%.

Subject Description: Topics covered will include: dependent sources; circuit analysis techniques; operational amplifiers; feedback; energy storage elements L, C; natural, forced and complete response of first and second order circuits; steady state sinusoidal circuits-phasors; frequency response, Bode diagrams and filters; Laplace and Fourier approaches to system and signal analysis; and block and signal flow diagrams.

ECTE212   Electronics and Communications   6cp

Spring   Wollongong   On Campus

Contact Hours: 58.5 hours

Pre-requisites: ELEC101 or ECTE101

Co-requisites: ELEC202 or ECTE202

Exclusions: ELEC211, ELEC212

Assessment: See Subject Information Sheet those presented here are only a guide. Tutorial assignments 10%; Laboratory work and Test 30%; Final Examination 60%.

Subject Description: The aims of this subject are: to provide students with an opportunity to develop an understanding of electronic circuit design using operational amplifiers as the building blocks and with an ability to analyse circuits using conventional methods; to introduce analogue modulation techniques and the circuit implementations required for analogue communications. Topics covered will include: using ideal operational amplifiers to construct: inverting and non-inverting amplifiers; summing amplifiers; integrators; comparators with and without hysteresis; peak detectors; and scaling adders; Digital-to-Analogue and Analogue-to-Digital conversion; determine the effect of the frequency response of non-ideal operational amplifiers and the effects of positive and negative feedback; signal representation in time and frequency domains; analogue modulation techniques (AM, FM); electronic circuit implementations of modulators and demodulators (AM, FM).

ECTE222   Power Engineering 1   6cp

Spring   Wollongong   On Campus

Contact Hours: 58.5 hours per session.

Pre-requisites: ELEC101 or ECTE101

Co-requisites: ELEC202 or ECTE202

Exclusions: ELEC221, ELEC222

Assessment: See Subject Information Sheet those presented here are only a guide. Mid session test - 10%; Laboratory work and Test - 30%; Final Examination - 60%.

Subject Description: Topics covered include: Typical power system loads; basic structure of a power system; electric power generation; single and three phase systems. Power system equipment: transformers, switch gear and protection. Installation practice: voltage drops, power factor correction, tariffs, safety, earthing, protection equipment rating. Power quality: system disturbances, equipment susceptibility, improvement and instrumentation.

ECTE233   Digital Hardware 1   6cp

Autumn   Wollongong   On Campus

Contact Hours: 58.5 hours

Pre-requisites: ECTE150 or ECTE195 or CSCI111

Exclusions: ELEC231, ELEC233

Assessment: See Subject Information Sheet those presented here are only a guide. Tutorial Tests - 10%; Laboratory work and test - 30%; Final examination - 60%.

Subject Description: Topics covered will include: combinational logic, simplification of logic expressions, Karnaugh maps; sequential logic, flip-flops, registers, clock, timing and synchronisation problems; sequential machines, Mealy and Moore machines, timing diagrams and state tables. Students will also be required to become proficient at writing simple programs for a microcontroller.

ECTE250   Engineering Design and   6cp
**   Management 2**

Spring/ Annual   Wollongong   On Campus

Contact Hours: 42 hours

Pre-requisites: ECTE150 or MGMT110; and MATH142 or MATH162 or MATH188

Co-requisites: ECTE202

Exclusions: ELEC250

Assessment: See Subject Information Sheet those presented here are only a guide. Examination (Lecture Material) - 30%; Reports (one per team per session) - 30%; Presentations (two per session) - 20%; Project Deliverables (two per session) - 20%.

Subject Description: ECTE250 will consist of a structured team design activity covering the first four phases of a product design cycle; conceptualisation, functional/target specification, design specification and detailed design. Products will be selected from a central theme. The team activity will be supplemented by lectures covering such areas as project planning, contracts/law, budgeting, quality, industrial and community relations, engineering ethics and social consequences. Student teams will undertake the entire project using staff as 'costed' advisors.

ECTE281   Embedded Internet Systems   6cp

Spring   Wollongong   On Campus

Contact Hours: 4.5 hours Lecture/Tutorial/Practical per week

Pre-requisites: ECTE101 or ECTE191 or ECTE196 or ECTE182

Assessment: See Subject Information Sheet those presented here are only a guide. Final examination - 60%;   Individual and/or group assignments (involving theoretical and practical/laboratory projects) - 30%; Oral presentation - 10%

Subject Description: The aim of this subject is to provide students with an understanding of the concepts and typical applications of embedded internet real-time systems. In addition, the methodologies and tools used to design and develop embedded internet real-time systems will also be covered. The subject will cover Web servers in embedded systems, embedded system configuration, real-time embedded databases, design for embedded internet, wireless embedded internet systems including WAP and Bluetooth technologies.

ECTE282   Internet Systems   6cp

Autumn   Wollongong   On Campus

Contact Hours: 4.5 hours per week

Pre-requisites: ECTE101 or ECTE196

Assessment: See Subject Information Sheet those presented here are only a guide. Final Exam - 60%; Assignments - 20%; Laboratory - 20%

Subject Description: This subject will examine Internet protocols, technologies and performance issues. In particular, the link layer technologies that underpin the Internet will be considered. Topics will include: TCP/IP, IP Addressing, Address Resolution Protocol (ARP), Asynchronous Transfer Mode (ATM), Ethernet, Gigabit Ethernet, Frame Relay, Congestion Control/Flow Control. The role of various standards bodies, e.g., Internet Engineering Task Force (IETF) and the International Telecommunications Union (ITU), will be examined. Laboratory exercises will illustrate the operation of key Internet protocols.

ECTE283   Internet Technology 2   6cp

Spring   Wollongong   On Campus

Contact Hours: 4.5 hours Lecture/Tutorial/Practical per week

Pre-requisites: ECTE101 or ECTE196

Assessment: See Subject Information Sheet those presented here are only a guide. Final Exam - 60%; Assignments - 20%; Laboratory - 20%

Subject Description: This subject examines recent Internet developments, particularly in access systems, quality of service deployment and scalable architectures. Emerging applications, such as Internet Telephony and Universal Multimedia Access (UMA) will be studied in depth, as well as the protocols that underpin them (e.g., routing, coding). Topics will include: OSPF, BGP4, Mobile IP, Integrated Services, Differentiated Services, Wireless Access Protocols, Simple Network Management Protocol (SNMP), Media Coding Schemes, RSVP, H.323 and SIP. Advanced laboratory exercises will illustrate the operation of various internet protocols.

ECTE290   Fundamentals of Electrical   6cp
**   Engineering**

Spring   Wollongong   On Campus

Contact Hours: 58.5 hours per session,

Pre-requisites: MATH141 or MATH161 or MATH187

Co-requisites: PHYS142 or PHYS143

Exclusions: ELEC290

Assessment: See Subject Information Sheet those presented here are only a guide. Practical Attendance and Performance - 13%; Practical Reports - 7%; Tutorial Assignment and Mid-session Test - 20%; Examination - 60%.

Subject Description: ECTE290 is offered as a servicing subject to students undertaking Bachelor of Engineering Degrees within the Faculty of Engineering. The aim of this subject is to provide students in other Engineering disciplines with an introduction to some basic concepts of electrical circuits, electrical measurements, instrumentation, data logging, and heavy current devices.

ECTE301   Digital Signal Processing 1   6cp

Spring   Wollongong   On Campus

Contact Hours: 4.5 hours per week.

Prerequisites: Year 1 subjects or equivalent, ECTE212

Exclusions: ELEC301

Assessment: See Subject Information Sheet those presented here are only a guide. Tutorial Assignments - 10%; Laboratory Work and Test - 30%; Final Examination - 60%.

Subject Description: Topics covered will include: sinusoids, spectrum representation, sampling and aliasing, FIR filters, frequency response, Z transform, bilinear transform, IIR filters, and spectral analysis.

ECTE313   Electronics   6cp

Annual   Wollongong   On Campus

Contact Hours: 57 hours per session.

Pre-requisites: Year 1 subjects or equivalent, ECTE202 and ECTE212

Co-requisites: ECTE344

Exclusions: ELEC311, ELEC313

Assessment: See Subject Information Sheet those presented here are only a guide. Tutorial Assignments - 10%; Laboratory work and Test - 30%; Final Examination - 60%.

Subject Description: Topics covered will include: analysis and design of: multistage amplifiers, feedback amplifiers, sinusoidal oscillators, analogue filters, non-linear circuits and power amplifiers.

ECTE323   Power Engineering 2   6cp

Autumn   Wollongong   On Campus

Contact Hours: 58.5 hours

Prerequisites: Year 1 subjects or equivalent, ECTE222 or MATH201 or MATH283

Exclusions: ELEC322

Assessment: See Subject Information Sheet those presented here are only a guide. Mid session test - 10%; Laboratory work and Test - 30%; Final Examination - 60%.

Subject Description: Topics covered will include: induction and dc machines; elements of electric motor drives; power electronics.

ECTE333   Digital Hardware 2   6cp

Spring   Wollongong   On Campus

Contact Hours: 58.5 hours per session.

Pre-requisites: Year 1 subjects or equivalent, ECTE233

Exclusions: ELEC332, ELEC333

Assessment: See Subject Information Sheet those presented here are only a guide. Tutorials - 10%; Laboratory Work and Test - 30%; Final Eamination – 60%.

Subject Description: Topics covered will include: computer architecture, central processing unit, memory (ROM and RAM), input/output devices; basic computer organisation, binary data and instruction codes, machine and assembly languages - instruction set, direct and indirect addressing; building computer systems from commercially available parts such as micro-processors and micro-controllers, static and dynamic memory, A/D and D/A converters, digital I/O, and serial communication integrated circuits.

Students will also be required to become proficient at interfacing a micro-controller with digital hardware and writing programs to control the hardware.

ECTE344   Control Theory   6cp

Autumn   Wollongong   On Campus

Contact Hours: 58.5 hours

Prerequisites: Year 1 subjects or equivalent, ECTE202 and (MATH201 or MATH283)

Exclusions: ELEC343, ELEC344

Assessment: See Subject Information Sheet those presented here are only a guide. Tutorial Assignments - 10%; Laboratory Work and Test - 30%; Final Examination - 60%.

Subject Description: Topics covered will include: mathematical modelling of physical systems; signal flow and state space representation of systems; steady state and transient analysis; root locus; frequency response analysis using Nyquist and Bode; design of PID, lag, lead, controllers using Bode and root locus methods; multiloop control.

ECTE350   Engineering Design and   6cp
Management 3

Annual   Wollongong   On Campus

Contact Hours: 38 hours

Pre-requisites: ECTE250

Co-requisites: 15 credit points at 300-level ECTE subjects

Exclusions: ELEC350

Assessment: See Subject Information Sheet those presented here are only a guide. Examination (Lecture Material) - 30%; Reports (one per team per session) 30%; Presentations (two per session) - 20%; Project Deliverables (two per session) - 20%.

Subject Description: ECTE350 will consist of a structured team design activity covering the final four phases of a product design cycle; continued detailed design, prototyping, testing/conformance, and sales/marketing. The team activity will be supplemented by lectures covering such areas as social and ethical considerations, psychology/ergonomics, accountancy, marketing, sales, and engineering test methodology. Student teams will undertake the entire project using staff as 'costed' advisers. In contrast with ELEC250, this subject emphasises the technical achievements of the group project.

ECTE363   Communication Theory   6cp

Autumn   Wollongong   On Campus

Contact Hours: 4.5 hours per week.

Prerequisites: ECTE212 and (MATH142 or MATH162 or MATH188)

Co-requisites: MATH201 or MATH283 or STAT131**Exclusions:** ELEC361, ELEC363

Assessment: See Subject Information Sheet those presented here are only a guide. Tutorials - 10%; Laboratory work and Test - 30%; Final Examination - 60%.

Subject Description: Topics covered will include: Gauss' and Stokes' theorems; Maxwell's equations, wave equation, plane wave propagation, Poynting vector; fundamentals of waveguide and antenna design; noise temperature, gain, figure of merit; microwave propagation; digital modulation schemes; error correction coding; TDMA and CDMA.

ECTE364   Telecommunications Networks 1   6cp

Autumn   Wollongong   On Campus

Contact   Hours: 54   hours
Prerequisites: MATH122 or MATH142 or MATH162 or MATH188 or STAT131

Exclusions: ELEC362, ELEC364

Assessment: See Subject Information Sheet those presented here are only a guide. Tutorials - 10%; Laboratory work and Test - 30%; Final Examination - 60%.

Subject Description: The aim of ECTE364 is to provide students with an understanding of the techniques that are used to provide communication between computer systems. Topics covered will include: coding, error detection and correction, serial communications, packet switching, protocols, modems, and computer networks.

ECTE371   Mechatronics Design   6cp

Annual   Wollongong   On Campus

Contact Hours: 1 hour Lecture, 2 hours Seminar per week.

Prerequisites: ENGG261

Co-requisites: ECTE344 and 12 credit points at 300-level MECH subjects

Assessment: See Subject Information Sheet those presented here are only a guide.

Examination (Lecture Material) 30%; Reports (one per team per session) 30%; Presentations (two per session) 20%; Project Deliverables (two per session) 20%

Subject Description: ECTE371 will include a structured team design activity covering the phases of a mechatronics product design cycle; including detailed design, prototyping, testing/conformance, and sales/marketing. Student teams will undertake the entire project using staff as 'costed' advisers.

ECTE381   Internet Engineering 1   6cp

Spring   Wollongong   On Campus

Contact Hours: 4.5 hours per week.

Prerequisites: ECTE292 or ECTE283 or ECTE364

Co-requisites: ECTE364

Assessment: See Subject Information Sheet those presented here are only a guide. Examination (Lecture Material) - 65%; Tutorials - 5%; Assignments - 15% and Practicals (including reports) - 15%.

Subject Description: The aim of this subject is to provide students with an understanding of the structure of the Internet and its basic engineering challenges. The subject covers the following topics: Internet architecture, Synchronous Digital Hierarchy and Gigabit Ethernet, Asynchronous Transfer Mode, the overlay and peer architectures, Multi-Protocol Label Switching, the principles of optical transmission, optical networking and photonic switching and introduction to traffic engineering and network planning.

ECTE391   Internet Technology Project   6cp
Not on offer in 2004

Pre-requisites: INFO202 and WAM of > 70 at the end of Year 2 full-time.

Assessment: See Subject Information Sheet those presented here are only a guide. Oral Presentation - 30%; Project and Report - 70%.

Subject Description: ECTE391 requires students to work on individual projects that may involve some background reading

and analysis, the development of hardware and/or the development of software. It will involve weekly tutorial sessions; a seminar presentation and report writing.

The aim of this subject is to provide an opportunity for students who have achieved the required pre-requisite to undertake an individual project and develop their initiative.

ECTE392   Wireless Internet   6cp

Autumn   Wollongong   On Campus

Contact Hours: 4.5 hours per week

Prerequisites: ECTE291 or ECTE282

Co-requisites: ECTE364

Assessment: See Subject Information Sheet those presented here are only a guide. Examination - 70%; Tutorials and Assignments - 30%.

Subject Description: The aim of this subject is to provide students with the knowledge to evaluate current and emerging trends in wireless networks in relation to the Internet. The following topics will be covered: wireless local area networks, personal area networking, mobility in the internet, wireless access protocols, internet in second and third generation mobile networks.

ECTE401   Fast Signal Processing Algorithms   3cp

Autumn   Wollongong   On Campus

Contact Hours: 4 hours weeks 1-6.

Pre-requisites: Year 2 subjects or equivalent, ELEC301 or 311 or ECTE301

Exclusions: ELEC402, ELEC401

Assessment: See Subject Information Sheet those presented here are only a guide. Written Examinations - 70%; Assignments - 30%.

Subject Description: The aim of this subject is to extend the digital signal processing knowledge gained in ELEC301 Digital Signal Processing 1. It forms a useful basis for subsequent DSP applications subjects. The contents will consist of: Discrete Transforms, including: FFT, DFT, DCT, etc.; Wavelet transforms; Filter Design and Structures and Multirate Signal Processing (Interpolation, Decimation ,etc.).

ECTE402   Stochastic Signal Processing   3cp
Not on offer in 2004

Pre-requisites: Year 2 subjects or equivalent, ELEC301 or 311 or ECTE301

Exclusions: ELEC402

Assessment: See Subject Information Sheet those presented here are only a guide. Written Examinations - 70%; Assignments - 30%.

Subject Description: The aim of this subject is to extend the digital signal processing knowledge gained in ELEC301 Digital Signal Processing 1. It forms a useful basis for subsequent DSP applications subjects. The contents will consist of: stochastic signals; least squares analysis, including optimal linear filters; spectral analysis, including linear predictive analysis; and basic scalar quantisation schemes (e.g., PCM, DPCM, ADPCM).

ECTE403   Image and Video Processing   3cp

Spring   Wollongong   On Campus

Contact Hours: 4 hours weeks 8-13.

Pre-requisites: Year 2 subjects or equivalent, ELEC301 or 311 or ECTE301

Assessment: See Subject Information Sheet those presented here are only a guide. Written Examinations - 70%; Assignments - 30%.

Subject Description: The aim of this subject is to extend the digital signal processing knowledge gained in ELEC301 Digital Signal Processing 1. The contents will consist of: applying digital signal processing in image and video processing applications.

ECTE404   Adaptive Signal Processing   3cp

Autumn   Wollongong   On Campus

Contact Hours: 3 hours weeks 8-13.

Pre-requisites: Year 2 subjects or equivalent, ELEC301 or 311 or ECTE301

Exclusions: ELEC403

Assessment: See Subject Information Sheet those presented here are only a guide. Written Examinations - 70%; Assignments - 30%.

Subject Description: The aim of this subject is to extend the digital signal processing knowledge gained in ELEC301 Digital Signal Processing 1. The contents will consist of: applying digital signal processing in adaptive signal processing (echo cancellation, channel equalisation, etc.) applications.

ECTE405   Speech and Audio Processing   3cp

Spring   Wollongong   On Campus

Contact Hours: 4 hours weeks 1-7.

Pre-requisites: Year 2 subjects or equivalent, ELEC301 or 311 or ECTE301

Exclusions: ELEC403

Assessment: See Subject Information Sheet those presented here are only a guide. Written examinations 70%; Assignments 30%.

Subject Description: The aim of this subject is to extend the digital signal processing knowledge gained in ELEC301 Digital Signal Processing 1. The contents will consist of: applying digital signal processing in speech and audio processing applications.

ECTE411   AC-Sourced Power Electronics   3cp
Not on offer in 2004

Pre-requisites: Year 2 subjects or equivalent, ELEC323 or 322 or 323 or ECTE323

Co-requisites: ELEC313 or 311 or ECTE313

Exclusions: ELEC411

Assessment: See Subject Information Sheet those presented here are only a guide. Written Examinations - 70%; Assignments - 30%.

Subject Description: Topics covered in this subject include: ac-sourced power electronics devices and their main applications, ac to dc power conversion and its industrial applications, ac voltage controllers, high power conversion in electric power utilities, harmonics and current research developments.

ECTE412   DC-Sourced Power Electronics   3cp

Autumn   Wollongong   On Campus

Contact Hours: 3 hours weeks 1-7.

Pre-requisites: Year 2 subjects or equivalent, ELEC222 or ECTE222

Co-requisites: ELEC313 or 311 or ECTE313

Exclusions: ELEC412

Assessment: See Subject Information Sheet those presented here are only a guide. Written Examinations 70%; Assignments 30%.

Subject Description: This subject will study power conversion circuits with dc-supplies and using modern power switching devices. Topics covered include: power switching devices and their application (diode, MOSFET, IGBT, gto), dc-dc conversion (choppers), including switch-mode power supplies, dc-ac conversion using inverters, including methods of pulse width modulation.

ECTE413   Micro-Electronics   3cp
Not on offer in 2004

Pre-requisites: Year 2 subjects or equivalent, ELEC313 or 311 or ECTE313

Assessment: See Subject Information Sheet those presented here are only a guide. Written Examinations - 70%; Assignments 30%.

Subject Description: The aim of this subject is to extend the electronics knowledge gained in ELEC313 Electronics. Topics covered will include: theory of operation of BJT and FET devices; the use of FET devices in analogue and digital circuits; CMOS logic family; oscillators; high frequency amplifiers; VLSI design techniques; gate arrays; programmable logic devices; memory cells. The practical component will consist of using Electronics Simulation Packages to (a) model circuits and examine their behaviour; (b) perform a logical design, (c) program the design into a programmable device and test its performance.

ECTE421   Power Quality   3cp

Spring   Wollongong   On Campus

Contact Hours: 3 hours weeks 8-13.

Pre-requisites: Year 2 subjects or equivalent, ECTE222

Co-requisites: ECTE301

Assessment: See Subject Information Sheet those presented here are only a guide. Written Examinations - 70%; Assignments - 30%.

Subject Description: This subject will study the different types of systems which can propagate in the electric power supply, their origins and their effects on sensitive equipment such as computers, telecommunications systems, PLCs and variable speed drives.

The disturbances include harmonics, voltage sags, capacity switching transients, voltage unbalance, etc. Topics discussed will include: the ability of equipment to emit disturbances, its susceptibility, industry standards and design techniques to ensure standards are met.

ECTE422   Power Quality Monitoring   3cp
Not on offer in 2004

Pre-requisites: Year 2 subjects or equivalent, ELEC323 or 322 or ECTE323

Assessment: See Subject Information Sheet those presented here are only a guide. Written Examinations - 70%; Assignments - 30%.

Subject Description: This subject will treat measurement techniques and waveform interpretation relevant to the operation of sensitive equipment with a non-ideal power supply. The different types of waveform disturbances and their characterisation will be discussed, such as harmonics, inter-harmonics, flicker and voltage sag. Relevant standards for signal analysis will be examined and their approach justified. There will also be a treatment of transducers.

ECTE423   Power Systems   3cp

Autumn   Wollongong   On Campus

Contact Hours: 3 hours weeks 1-7.

Prerequisites: Year 2 subjects or equivalent, ECTE222

Assessment: See Subject Information Sheet those presented here are only a guide. Written Examinations - 70%; Assignments - 30%.

Subject Description: Topics covered in this subject include: an introduction to power systems comprising thermal and hydro power stations, transmission lines and distribution systems, renewable energy, other energy sources such as solar energy, windmills, sea waves and geothermal, computer applications in power systems planning, design, control and operation, review of basic analysis tools, reactive power management, load flow and fault analysis and flexible ac transmission technology, and environmental considerations.

ECTE424   Power System Abnormalities   3cp
Not on offer in 2004

Prerequisites: Year 2 subjects or equivalent, ECTE222

Assessment: See Subject Information Sheet those presented here are only a guide. Written Examinations - 70%; Assignments - 30%.

Subject Description: Topics covered include: reliability concerns, insulation requirements and protection methods of energy systems. The design aspect of energy systems for reliable and economical energy supply, internal and external overvoltage protection of energy systems and terminal equipment, stability limits of energy systems and the application of electromagnetic transient programmes (EMTP) for insulation co-ordination will be discussed.

ECTE425   Industrial Drives and Actuators   3cp

Autumn   Wollongong   On Campus

Contact Hours: 3 hours weeks 8-13.

Pre-requisites: Year 2 subjects or equivalent, ECTE222

Co-requisites: ECTE344

Assessment: See Subject Information Sheet those presented here are only a guide. Written Examinations - 70%; Assignments - 30%.

Subject Description: Topics covered in this subject include: selection of dc, ac motors (induction and/or permanent magnet) and actuators for industrial applications and the design of closed loop speed control systems for dc and ac motors. In ac motor control, field orientation will be given particular emphasis.

ECTE426   Power Equipment Design   3cp

Spring   Wollongong   On Campus

Contact Hours: 3 hours weeks 1-7.

Pre-requisites: Year 2 subjects or equivalent, ELEC323 or 322 or ECTE323

Assessment: See Subject Information Sheet those presented here are only a guide. Written Examinations - 70%; Assignments 30%.

Subject Description: Topics covered in this subject include: design aspects of transformers, ac motors and generators and industrial actuators for motion control. The design and analysis of magnetic circuits to meet requirements such as: torque/weight ratio, losses, heating and cooling will be addressed. Essentials of electromagnetic analysis using simulation software (e.g., finite element methods) will be covered.

ECTE431   Real-Time Computing   3cp

Autumn   Wollongong   On Campus

Contact Hours: 24 hours

Pre-requisites: Year 2 subjects or equivalent, ELEC333 or 332 or ECTE333

Assessment: See Subject Information Sheet those presented here are only a guide. Written Examinations - 70%; Assignments - 30%.

Subject Description: The aim of this subject is to extend the digital hardware knowledge gained in ECTE333 Digital Hardware 2. Topics covered will include: real-time operating systems; interrupts; interfacing to real world signals; use of A/D and D/A converters; multi-tasking, multi-threading; clocks and timers; and direct digital control. The practical component will consist of writing real-time programs on DSP and micro-controller computer systems.

ECTE432   Computer Systems   3cp

Autumn   Wollongong   On Campus

Contact Hours: 24 hours

Pre-requisites: Year 2 subjects or equivalent, ELEC333 or 332 or ECTE333

Exclusions: ELEC432

Assessment: See Subject Information Sheet those presented here are only a guide. Written Examinations 70%; Assignments 30%.

Subject Description: The aim of this subject is to extend the digital hardware knowledge gained in ECTE333 Digital Hardware 2. Topics covered will include: CPU organisation; complex instruction sets; reduced instruction sets; I/O structures; interrupts; direct memory access; intelligent peripherals; interfacing to real world signals; use of A/D and D/A converters; multi-processors; parallel DSP architectures. The practical component will consist of writing programs on micro-controller computer systems.

ECTE441   Intelligent Control   3cp

Spring   Wollongong   On Campus

Contact Hours: 24 hours – weeks 1-7

Pre-requisites: Year 2 subjects or equivalent, ELEC344 or 343 or ECTE344

Exclusions: ELEC443

Assessment: See Subject Information Sheet those presented here are only a guide. Written Examinations - 70%; Assignments - 30%.

Subject Description: The subject provides the knowledge and skills required to model, analyse and design a system using intelligent methods. The contents will consist of: introduction to fuzzy systems, introduction to artificial neural network, crisp

fuzzy control systems, adaptive fuzzy control systems, and neuro-fuzzy control systems.

ECTE442 Computer Controlled Systems 3cp
Not on offer in 2004

Pre-requisites: Year 2 subjects or equivalent, ELEC344 or 343 or ECTE344

Exclusions: ELEC443

Assessment: See Subject Information Sheet those presented here are only a guide. Written Examinations - 70%; Assignments - 30%.

Subject Description: This subject provides the knowledge and skills required to model, analyse and design computer controlled systems in the z-domain. The contents will consist of: Discrete time state space modelling of system, stability analysis in state space, controllability and observability, pole placement design and state feedback, state observer design.

ECTE443 Digital Control 3cp
Not on offer in 2004

Pre-requisites: Year 2 subjects or equivalent, ELEC344 or 343 or ECTE344

Exclusions: ELEC443

Assessment: See Subject Information Sheet those presented here are only a guide. Written Examinations - 70%; Assignments - 30%.

Subject Description: This subject provides the knowledge and skills required to model, analyse and design computer controlled systems in the z-domain.

The contents will consist of: Impulse sampling, stability analysis in the Z-domain, root locus analysis and design in the Z-domain, W-transformation, frequency response analysis and design in the Z-domain and current research developments.

ECTE444 Identification and Optimal Control 3cp
Not on offer in 2004

Pre-requisites: Year 2 subjects or equivalent, ELEC344 or 343 or ECTE344

Exclusions: ELEC444

Assessment: See Subject Information Sheet those presented here are only a guide. Written Examinations - 70%; Assignments - 30%.

Subject Description: The subject provides the knowledge and skills required to identify the model of a system and optimise its performance. The contents will consist of: system identification using the least square method and quadratic performance index; quadratic optimal control; Kalman filters; and applications of genetic algorithms in system identification and optimal control.

ECTE457 Thesis 18cp

Annual   Wollongong   On Campus

Contact Hours: 48 hours

Pre-requisites: All subjects to the end of Year 3 or equivalent

Co-requisites: 18 credit points at 400-level or CSCI311 and 12 credit points at 400-level

Exclusions: ELEC457

Assessment: The mark for each session will be calculated according to the following formula: Sessional mark = 0.6 * (Supervisor's mark out of 100%) + 0.3 * (Co-Supervisor's mark out of 100%) + 0.1 * (Seminar Presentation out of 100%) - Penalty points. Final mark = 0.35 * (Autumn Session mark out of 100%) + 0.65 * (Spring Session mark out of 100%).

Subject Description: ECTE457 requires students to work on individual projects which may involve some background reading and analysis, the development of hardware, the development of software, or an experimental program. It will involve weekly tutorial sessions; presentation of seminars; and writing of reports. The aim of this subject is to provide an opportunity for students to undertake a major engineering project and develop their initiative.

ECTE461 Telecommunications Queueing 3cp
Theory

Autumn   Wollongong   On Campus

Contact Hours: 24 hours – weeks 1-7.

Pre-requisites: Year 2 subjects or equivalent, ELEC364 or ECTE364 or ECTE485/483 or ELEC362 or ELEC469

Exclusions: ELEC460

Assessment: See Subject Information Sheet those presented here are only a guide. Written examinations 70%; Assignments 30%.

Subject Description: The aim of this subject is to provide students with telecommunication engineering skills including analysis of delay and loss queueing systems, undertake Markov modelling and analysis, and calculate blocking probabilities of telephone switching equipment. Topics covered will include: queueing theory, Markov chain analysis, throughput and congestion analysis, Erlang and Engset distributions, blocking probability and overflow traffic.

ECTE462 Telecommunications System 3cp
Modelling

Autumn   Wollongong   On Campus

Contact Hours: 24 hours – weeks 8-13.

Pre-requisites: Year 2 subjects or equivalent, ELEC364 or ECTE364 or ECTE485/483 or ELEC362 or ELEC469

Exclusions: ELEC460

Assessment: See Subject Information Sheet those presented here are only a guide. Written Examinations - 70%; Assignments 30%.

Subject Description: The aim of this subject is to provide students with telecommunication engineering skills including skills to analyse and dimension telephone exchanges, trunk lines, Internet switches and circuit and packet switched networks. Topics covered will include: telephone and data networks and systems, mixed voice and data queueing systems, optimal capacity allocation, direct and alternate routing.

ECTE463 Transmission Systems 3cp
Not on offer in 2004

Pre-requisites: Year 2 subjects or equivalent, ELEC363 or 361 or ECTE363

Exclusions: ELEC463

Assessment: See Subject Information Sheet those presented here are only a guide. Written examinations 70%; Assignments 30%.

Subject Description: Topics covered include: Maxwell's equations, wave propagation in transmission lines, the Smith chart, wave guides and optical fibres. The aim of this subject is

to provide methods of characterising distributed passive transmission media such as transmission lines, wave guides, and fibre optics.

ECTE464   Antennas and Propagation   3cp
Not on offer in 2004

Pre-requisites: Year 2 subjects or equivalent, ELEC363 or 361 or ECTE363

Exclusions: ELEC463

Assessment: See Subject Information Sheet those presented here are only a guide. Written Examinations - 70%; Assignments - 30%.

Subject Description: Topics covered include: wave propagation in the air and signal radiation and antennas. The aim of this subject is to provide methods of characterising antenna systems for use in communications.

ECTE465   Wireless Communications   3cp
Not on offer in 2004

Pre-requisites: Year 2 subjects or equivalent, ELEC363 or 361 or ECTE363

Assessment: See Subject Information Sheet those presented here are only a guide. Written Examinations - 70%; Assignments - 30%.

Subject Description: The aim of this subject is to introduce wireless communication systems, including cellular telephony, personal communications, and wireless local area networks. The contents will consist of: mobile radio channel characterisation, channel access techniques used in wireless systems and error control coding. The taught concepts will be illustrated by examples of existing wireless communication systems and those being developed.

ECTE466   Spread Spectrum Communications   3cp
Not on offer in 2004

Pre-requisites: Year 2 subjects or equivalent, ELEC363 or 361 or ECTE363

Assessment: See Subject Information Sheet those presented here are only a guide. Written Examinations 70%; Assignments - 30%.

Subject Description: The aim of this subject is to teach students the theory and highlight the major problems involved in application of spread-spectrum communications. The contents will consist of: basic spread-spectrum techniques, principles of code division multiple access (CDMA), design of spreading sequences, and detection techniques for CDMA. The taught concepts will be illustrated by examples of existing spread-spectrum communication systems.

ECTE467   Mobile Networks   3cp
Not on offer in 2004

Pre-requisites: Year 2 subjects or equivalent, ELEC364 or ECTE364 or ECTE485/483 or ELEC362 or ELEC469

Assessment: See Subject Information Sheet those presented here are only a guide. Written examinations 70%; Assignments 30%.

Subject Description: The aim of this subject is to provide students with the knowledge to evaluate current and emerging mobile networks. Topics covered will include: analogue and digital mobile networks, roaming in mobile networks, GSM standards and principles, GSM network structure, call hand-over analysis, mobility in the Internet, emerging third generation mobile networks.

ECTE468   Error Control Coding   3cp
Not on offer in 2004

Pre-requisites: Year 2 subjects or equivalent, ELEC301 or 363 or ECTE301 or 363

Assessment: See Subject Information Sheet those presented here are only a guide. Written Examinations - 70%; Assignments - 30%.

Subject Description: The subject includes general concepts of information transmission and covers error-correction techniques applied to data transmission over error-prone (noisy) channels. Topics covered are forward error correction schemes like linear codes, cyclic codes, block codes (e.g. BCH and Reed-Solomon codes), and convolutional codes, as well as error control for channels with feedback, e.g. automatic repeat request (ARQ) coding.

ECTE471   Robotics Manipulators   3cp
Spring   Wollongong   On Campus

Contact Hours: 24 hours – weeks 1-7.

Pre-requisites: Year 2 subjects or equivalent, ELEC344 or 343 or ECTE344

Exclusions: ELEC473

Assessment: See Subject Information Sheet those presented here are only a guide. Written examinations 70%; Assignments 30%.

Subject Description: The subject provides the knowledge and skills required to model, analyse, design and employ a robotics manipulator. The contents will consist of: Industrial robots as a component of automation, mathematical modelling of a robotics arm, direct and inverse kinematics model, direct and inverse dynamics model, trajectory planning, robot control.

ECTE472   Robotics Sensory Control   3cp
Spring   Wollongong   On Campus

Contact Hours: 24 hours – weeks 8-13

Pre-requisites: Year 2 subjects or equivalent, ELEC344 or 343 or ECTE344

Co-requisites: ELEC313 or ELEC311 or ECTE313

Exclusions: ELEC473

Assessment: See Subject Information Sheet those presented here are only a guide. Written Examinations - 70%; Assignments - 30%.

Subject Description: This subject provides the knowledge and skills required to design appropriate sensors for the intelligent operation of robotics systems. Topics covered include: intelligent operation of robots, industrial vision, hand-eye control of a robot, tactile sensors, force sensors, ultrasound sensors, and other sensors.

ECTE481   Internet Protocols   3cp
Not on offer in 2004

Pre-requisites: Year 2 subjects or equivalent, ELEC364 or ECTE364 or ECTE485/483 or ELEC362 or ELEC469

Assessment: See Subject Information Sheet those presented here are only a guide. Written Examinations - 70%; Assignments - 30%.

Subject Description: This subject will provide students with an understanding of protocols used in the computer networks.

Examples will be drawn from existing networks including the Internet. Students will learn what computer network protocols are and how they work today, and how they are likely to evolve in the future. Topics to be studied will include: LAN medium access control protocols, congestion/flow/error control, routing, addressing, and internetworking. There will be both written and programming assignments, including a project involving the design and implementation of an exemplar protocol.

ECTE482   Internet Engineering   3cp

Spring   Wollongong   On Campus

Contact Hours: 3 hours weeks 8-13

Pre-requisites: Year 2 subjects or equivalent, ELEC364 or ECTE364 or ECTE485/483 or ELEC362 or ELEC469

Assessment: See Subject Information Sheet those presented here are only a guide. Written Examinations - 70%; Assignments - 30%.

Subject Description: This subject will provide students with an understanding of the design and operation of computer networks, with emphasis on the Internet. Students will learn what networks are and how they work today, and how they are likely to evolve in the future. Topics to be studied will include: design and operation of the Internet (including IPv4, OSPF, BGP, Mobile IP, CIDR, mobile IP, IPv6, TCP, and UDP), the role of ATM in the Internet (including the use of MPOA and MPLS), and mechanisms for engineering networks to provide QoS (such as RSVP, RTP, ATM service classes, and IETF DiffServ). There will be both written and programming assignments.

ECTE483   Computer Networking   3cp

Not on offer in 2004

Pre-requisites: Year 2 subjects or equivalent

Exclusions: ELEC364

Assessment: See Subject Information Sheet those presented here are only a guide. Written Examinations - 70%; Assignments - 30%.

Subject Description: The aim of this subject is to provide students with an understanding of the techniques that are used to provide communication between computer systems. Topics covered will include: modems, addressing, routing, interworking and congestion control in computer networks.

ECTE484   Network Design and Analysis   3cp

Contact Hours: Not on offer in 2004

Pre-requisites: Year 2 subjects or equivalent, ELEC364 or ECTE364 or ECTE485/483 or ELEC362 or ELEC469

Assessment: See Subject Information Sheet those presented here are only a guide. Written Examinations - 70%; Assignments - 30%.

Subject Description: The aim of this subject is to provide students with the engineering skills to analyse multi-service packet switched networks and systems. Topics covered will include: simulation and numerical techniques in queueing, software tools for analysis of queueing systems and networks, queueing performance analysis of Internet, ATM and mobile multi-service networks.

ECTE485   Internet Communications   3cp

Spring   Wollongong   On Campus

Contact Hours: 3 hours weeks 1-7

Pre-requisites: Year 2 subjects or equivalent

Exclusions: ELEC364, ECTE364

Assessment: See Subject Information Sheet those presented here are only a guide. Written Examinations - 70%; Assignments - 30%.

Subject Description: The aim of this subject is to provide students with an understanding of the techniques that are used to provide communication between computer systems. Topics covered will include: layered protocol architectures, circuit and packet switching, asynchronous and synchronous transmission, coding, error detection and correction and flow control.

ECTE486   Telecommunications Network   3cp
             Management

Spring   Wollongong   On Campus

Contact Hours: 3 hours weeks 1-7

Pre-requisites: Year 2 subjects or equivalent, ELEC363 or 361 or ECTE363

Exclusions: ELEC468

Assessment: See Subject Information Sheet those presented here are only a guide. Written Examinations - 70%; Assignments - 30%.

Subject Description: The aims of this subject are to provide students with an understanding of the technical issues of telecommunications management and to provide practical hands-on experience of network configuration and management systems. Topics covered will include: private and public communications systems; LANs and SNMP; general management issues; and international standards.

ECTE491   Computer Architectures   6cp

Autumn   Wollongong   On Campus

Contact Hours: 48 hours

Pre-requisites: ELEC333 or 332 or ECTE333

Exclusions: ELEC431/432 ECTE431/432

Assessment: See Subject Information Sheet those presented here are only a guide. Written Examinations - 70%; Assignments - 30%

Subject Description: The aim of this subject is to extend the digital hardware knowledge gained in ECTE333 Digital Hardware 2. Topics covered will include: CPU organisation; complex instruction sets; reduced instruction sets; I/O structures; interrupts; direct memory access; intelligent peripherals; interfacing to real world signals; use of A/D and D/A converters; real-time operating systems; multi-tasking, multi-threading; multi-processors; parallel DSP architectures; clocks and timers; and direct digital control. The practical component will consist of writing real-time programs on DSP and micro-controller computer systems.

ECTE492   Intelligent and Optimal Control   6cp

Not on offer in 2004

Pre-requisites: ELEC343 or 344 or MECH365 or ECTE344

Exclusions: ELEC441/444, ECTE441/444

Assessment: See Subject Information Sheet those presented here are only a guide. Written Examinations - 70%; Assignments - 30%

Subject Description: The subject provides the knowledge and skills required to analyse and design a system using intelligent

methods and optimise its performance. The contents will consist of: introduction to fuzzy systems and artificial neural networks, crisp fuzzy, adaptive fuzzy and neuro-fuzzy control systems; system identification using the least square method and quadratic performance index; quadratic optimal control; Kalman filters; and applications of genetic algorithms in system identification and optimal control.

ECTE494   Robotics   6cp

Spring   Wollongong   On Campus

Contact Hours: 48 hours

Pre-requisites: ELEC332, 343 or 333, 344 or MECH226 or ECTE333, 344

Exclusions: ELEC473, ECTE471/472

Assessment: See Subject Information Sheet those presented here are only a guide. Written Examination - 70%; Assignments - 30%

Subject Description: The aim of ECTE494 is to provide students with an opportunity to study the basic principles and concepts of robotics and its application in modern manufacturing systems. Topics covered will include: survey of industrial robot types; strengths and weaknesses of actual robots; the robot as a component of automation; automation and labour relations; vision, tactile and other sensors; design criteria for robots; and the kinematics and dynamics of manipulator arms.

IACT201   Information Technology and   6cp
Citizens' Rights

Autumn	Wollongong	On Campus
Autumn	Shoalhaven	On Campus
Autumn	Batemans Bay	On Campus
Autumn	Bega/ Moss Vale	On Campus

Contact Hours: 3 hours per week

Pre-requisites: 24cp @100 level

Assessment: To be advised - refer Subject Outline.

Subject Description: IACT201 will examine the information technology industry which encompasses: telecommunications; computing; broadcasting and publishing. It will analyse the encroachment of industry activities that use electronic media on: citizens' rights in matters of data surveillance; freedom of access to information and ownership of intellectual property. The extent to which technical solutions to these problems can and cannot be provided will be discussed and alternative non-technical (eg administrative or regulatory) solutions will also be treated. An investigation of the current legal safeguards, their legislative histories and the need for new legislation will be covered.

IACT202   The Structure and Organisation   6cp
of Telecommunications

Spring	Wollongong	On Campus
Spring	Shoalhaven	On Campus
Spring	Batemans Bay	On Campus
Spring	Bega/ Moss Vale	On Campus

Contact Hours: 3 hours per week

Pre-requisites: IACT101 OR CSCI102 or CSCI111

Assessment: Class participation - 20%; Weekly Tutorial Report - 20%; Seminar Presentation - 10%; Examination - 50%.

Subject Description: The aim of the subject is to provide students with an introduction to the technologies and regulatory structures which constitute the modern telecommunications system. Under regulatory components, the variety of telecommunications services and related regulatory concepts and structures are discussed. Under technological components, the following issues are dealt with: telecommunications standards; new network services; and basic components of the telecommunications system such as the public switched network, the radio frequency spectrum, mobile telephony and satellites.

IACT301   Information and Communication   6cp
Security Issues

Spring   Wollongong   On Campus

Contact Hours: 3 hours per week

Pre-requisites: IACT201

Assessment: Assignment 1- 10%;   Seminar presentation + seminar - 40% Exam - 50%

Subject Description: This subject will examine current controls, both legislative and technical, aimed at maintaining data integrity, ease of access to information, and protection of ownership, in the light of on going developments in computer security, multimedia communications, international electronic networks, and electronic publishing. The subject will cover communication security; issues relating to the monitoring of international agreements; OECD guidelines for security of information; maintaining privacy provisions; password security; and future IT developments and their implications for monitoring intellectual property rights and communication security.

IACT302   Corporate Network Planning   6cp

Autumn   Wollongong   On Campus

Contact Hours: 3 hours Lecture / Tutorial, 2 hours labs per week.

Pre-requisites: IACT202 or ELEC211 or ELEC212 or ECTE211 or ECTE212

Assessment: made up of Strategic network plan; Seminar presentation; Tutorial Paper and Final Examination.

Subject Description: This subject explores telecommunications network planning from a strategic perspective. Topics covered will include: (1) Fundamental Networking Concepts: standards, protocols, architectures and technologies (2) Fundamental Data Networking Concepts: network topologies, network devices, wireless networking, security and applications (3) Fundamental Voice Networking Concepts: history, network classifications, the telephone system and voice communications, architectures, cellular networks (4) Convergence Of Voice And Data In Telecommunications: frame/cell relay, broadband networks, emerging technologies.

IACT303   World Wide Networking   6cp

Spring   Wollongong   On Campus

Contact Hours: 3 hours per week

Pre-requisites: IACT101 or CSCI102 or CSCI213 or BUSS110 or CSCI111

Assessment: Examination - 40%; Participation - 20%; Proposal for Web - 5%; Group Seminar & Paper - 15%; Web Pages - 20%.

Subject Description: This subject investigates the issues listed in the schedule below within the context of world wide networking. Emphasis will be placed on group work with students required to participate in problem solving communications tasks. Web based activities will be an essential

element in the conduct of this subject. Other activities may include: the setting up and conduct of a video-conference with students at another University, the running of a bulletin board or Internet mailing list or the maintenance of a World Wide Web site. Contributions to this subject have been made by several members of staff within the School.

IACT304   eBusiness Fundamentals   6cp

Autumn   Wollongong   On Campus

Contact Hours: 3 hours per week

Pre-requisites: 12 cp at 200 level in IACT or CSCI

Exclusions: IACT305 or CSCI370

Assessment: Essay - 15%; Seminar Presentation - 10%; Tutorial Participation - 10%; Essay - 25%; Examination - 40%.

Subject Description: This subject aims to provide students with an understanding of eBusiness fundamentals. Today most businesses compete in a global environment and a sound strategy for online business is essential to facilitate this. This subject covers key areas of eBusiness, including: business-to-consumer, business-to-business and business-to-government electronic commerce (EC); online business models and electronic payment systems (EPS) and EC technology basics. Standards, regulation and policy, security and social and economic issues will also be considered in the contexts of business Intranets, Extranets and the Internet. The subject also provides an introduction to the 'Patterns for eBusiness' approach to eBusiness analysis and design.

IACT305   eBusiness Technologies   6cp

Autumn   Wollongong   On Campus

Contact Hours: 3 hours per week

Pre-requisites: 12 cp at 200 level of IACT or CSCI

Exclusions: IACT304 or CSCI370 or ITCS938

Assessment: Mid Session Test - 10%   Assignment - 30% Exam - 60%

Subject Description: The subject explores the technology being adopted by organisations and the various means of maximising business potential using Internet technology, including eBusiness (B2B, B2C, B2G etc.). The focus of the course is from the IT professional perspective, giving the student a feel for what is required in a commercial business environment. The technology aspects will cover both developing in house software, as well as selecting 'best practice' outsourced options. Comparisons are drawn between the two adoption methods, and the student is engaged by scenario role playing as part of the group assignments.

IACT401   IT Strategic Planning   6cp

Autumn   Wollongong   On Campus

Contact Hours: 3 hours per week

Pre-requisites: 24cp @ 300 level

Exclusions: IACT901

Assessment: Tutorial Readings - Report - 10%; Tutorial Participation - 10%; Essay (2000 words) - 20%; Critique IT Strategic Plan - 40%; Seminar - 20%.

Subject Description: The subject is essentially about the application of technology for competitive advantage. Throughout the subject, the spotlight will be trained on techniques and frameworks for "thinking strategically about a company's technological orientation". A wide spectrum of business and technology issues will be covered that address the problems and issues surrounding the analysis and development of an IT strategic plan.

IACT402   Applied Project Management   6cp

Autumn   Wollongong   On Campus

Contact Hours: 3 hours Lectures per week

Pre-requisites: 24cp @ 300 level

Assessment: Assessment - 40% Examination - 60%

Subject Description: IACT402 deals with the efficient management of a medium size project to ensure that a project meets deadlines and is within its budget. It covers the process of planning, directing and controlling the development of an IT project. Topics covered will include project management tools, software and techniques; expectations management matrices; and use of people management (the subtle art of delegation and accountability). Students will test the principles on the plan, design and implementation of a medium size project.

IACT403   Human Computer Interface   6cp

Spring   Wollongong   On Campus

Contact Hours: 3 hours per week

Pre-requisites: 24cp @ 300 level

Exclusions: CSCI324

Assessment: Final Exam - 40%; Assessment - 60%

Subject Description: IACT403 examines the design evaluation and implementation of interactive computing systems for human use (HCI) and the major phenomena surrounding them. Also considered are joint performance of tasks by humans and machines, structure of human machine communication, social and organizational interactions with machine design, human capabilities to use machines including their learnability as well as algorithms and programming of the interface itself, engineering concerns that arise in designing interfaces, the process of specification design and implementation of interfaces and design tradeoffs.

IACT404   International Telecommunications   6cp
            Policy Issues
Not on offer in 2004

Pre-requisites: 24cp @ 300 level

Subject Description: IACT 404 provides students with an understanding of the policy issues relating to the emergence of political, economic and technological change in international telecommunications. The interdisciplinary foundations of telecommunications policy are examined. Issues in the development of telecommunications policy in Australia and overseas are reviewed as well as the regulatory frameworks adopted by different countries (eg. Australia and the United States) and regions (eg. European Union and South East Asia).

IACT405   Information Technology and   6cp
            Innovation

Autumn   Wollongong   On Campus

Pre-requisites: 24cp @ 300 level

Assessment: Examination - 40%; Tutorial/seminar assignments - 40%; Essay - 20%

Subject Description: The rapid development of information technology networks has prompted governments to develop national policies to promote the growth of services in these areas. Innovation in information technology and its effective use

is now seen to underpin international competitiveness. Successful innovation policies are now central to the future viability of industry and nations alike. This subject addresses key themes such as: the importance of innovation to the economy and the firm; the links between information, information technology and innovation; and, the development of effective national policies to promote industrial innovation. Issues such as the role of multinationals, transborder data flows and research and development are discussed in this context.

IACT406   Strategic eBusiness Solutions   6cp

Spring   Wollongong   On Campus

Contact Hours: 3 hours per week

Pre-requisites: IACT304 or CSCI370

Exclusions: ITCS436 or ITCS450

Assessment: Project - Part A 20%; Project- Part B 30%; Seminar Presentation 10%; Tutorial Participation 10%; Examination 30%

Subject Description: This subject aims to provide students with an understanding of how to design integrated solutions for eBusiness using a pattern-oriented approach. Enterprises, both large and small, as well as government institutions, are increasingly becoming reliant upon eBusiness infrastructure. Knowing the strategic business and technology principles and practices related to the design process is becoming increasingly important for a given organisation. This subject will cover business scenarios including electronic data interchange (EDI), supply chain management (SCM), enterprise application integration (EAI), customer relationship management (CRM), sales force automation (SFA); and knowledge management systems (KM).

IACT416   Organisational Issues in   6cp
Information Technology

Not on offer in 2004

Pre-requisites: 24cp @ 300 level

Assessment: Seminar presentation - 15%; Seminar paper - 15%; Essays - 70%.

Subject Description: IACT416 aims to provide the student with an understanding of issues related to the combination of management, workers and information technology. Students will gain an appreciation of the complexity of the issues involved in decision making when people and technology are concerned. Students will also develop an understanding across commerce and industry of the parallels that exist in the development, implementation and application of information and communication technology. Effect on organisational information flows of growth in size and complexity: the management and technological response. Information technology as a catalyst in codifying work procedures and creating new organisational structures. Hierarchical versus horizontal approaches to information management. Management theory and IT. Industrial use of IT and parallels with office sector usage. Implications of broadband networks for traffic integration and subsequent application in commerce and industry.

IACT417   Information Management   6cp

Autumn   Wollongong   On Campus

Contact Hours: 3 hours per week

Pre-requisites: 24 cp @ 300 level

Assessment: Group Project Proposal - 10%; Group Seminar 15%; Participation - 10%; Examination - 40%; Group Report/Project - 25%

Subject Description: This subject focuses on the importance of information as a resource, on which the knowledge base of successful organisations is dependent. While the main focus of the subject is information management within the organisation, a broader context is important. National and international issues relating to information access will be addressed. These include: standards relating to electronic storage and retrieval of electronic documents (digital archiving); legal protection for information as an economic good (for example as patents, copyright and other forms of intellectual property); and social and ethical issues (eg privacy and security) relating to information management

IACT418   Corporate Network Management   6cp

Autumn   Wollongong   On Campus

Contact Hours: 3 hours per week

Pre-requisites: 24cp @ 300 level

Assessment: Major Project - 40%; Seminar Presentation - 10%; Tutorial Paper - 10%; Final Examination - 40%

Subject Description: The subject investigates the documentation and management of telecommunications networks. Topics to be covered include 1. Documenting the Network: requirements capture and specification, functional specification, design specification, documenting the network configuration 2. Managing the Network: influences on the network, management architectures and standards, performance management, fault management, disaster management, managing changes in a network, cost minimisation management and 3. Corporate and Regulatory Requirements: management teams, operations and support, standards and protocols.

IACT419   Online Information Services   6cp

Spring   Wollongong   On Campus

Contact Hours: 3 hours per week

Pre-requisites: 24cp @ 300 level

Assessment: Practical Work - 20%; Essays - 30%; Project or Report - 30%; Seminar and Seminar Paper - 20%.

Subject Description: This subject examines the emergence of electronic information supermarkets and the changes in ownership that have taken place within the online information industry as mass media conglomerates have entered the field. Other aspects covered include: the role of government in the development of online databases and networks; the creation of "value-added" products through re-formatting, marketing and electronic delivery of information; the future of public information sources such as libraries and government data collection and publication agencies in a changing online environment; and the potential of network developments such as AARNet, the Internet, and NREN in the delivery of online information resources. Some practical experience in the use of electronic information services is provided including Australian and international databases and computer networks.

IACT422   Case Studies in Information   6cp
Technology Applications

Spring   Wollongong   On Campus

Pre-requisites: 24cp @ 300 level

Subject Description: IACT422 examines leading edge technological developments and the issues arising from the innovative uses of such technology. This subject covers innovative and new applications of information technology to create services and systems, eg electronic banking, video

conferencing, multimedia, EDI and CD-ROM. In order to provide a thorough background and understanding of an application, normally only one case will be studied in the subject in any one semester. Cases that may be covered include, multimedia, EDI and EFTPOS.

IACT424 Corporate Network Design and 6cp Implementation

Spring Wollongong On Campus

Contact Hours: 3 hours per week

Pre-requisites: 24cp @ 300 level

Assessment: Major project - 40% Seminar presentation - 10% Tutorial Paper - 10%; - Final Examination - 40%

Subject Description: The subject investigates the design and implementation of a telecommunications network plan. Topics to be covered include (1) The Need for Planning and the Planning Process: planning teams, strategic planning, the network plan, security planning and implementation planning. (2) The Design Process: design teams, translating the plan into design criteria, requirements capture and specification, design requirements and criteria, choosing topographies and architectures, evaluating plans (3) The Implementation Process: implementation teams, validating implementation plans, managing people and technology, managing the implementation process.

IACT426 Information Society, Knowledge 6cp Work and Information Technology

Not on offer in 2004

Pre-requisites: 24cp @ 300 level

Assessment: Examination - 30%; Seminar presentation - 10%; Seminar paper - 10%; Essay - 25%; Project - 25%

Subject Description: The subject examines the concept of 'information society' and its measurement. It also examines the changing structure of the workforce with an investigation of the place and role of knowledge workers in the labour force being a core element. An examination of the trends affecting knowledge workers in Australia, and internationally, with respect to increasing credentialism, life-long learning and issues relating to their education and training will be undertaken. The introduction and application of IT affects each of these areas is therefore another critical component of study.

IACT430 Special Topics in Information and 6cp Communication Technology

Autumn Wollongong On Campus

Contact Hours: 3 hours per week.

Pre-requisites: 24 @300 level

Subject Description: This is an elective subject usually undertaken in the Honours year of the BInfoTech degree, and is also available to students from other disciplines. IACT430 aims to provide the student with an understanding of topics at the forefront of the discipline. Topics will be selected from areas of interest of staff members or visiting staff members to the School. These will include topics in the application of information and communication technology.

IACT433 Special Topics in 6cp Telecommunications Issues

Not on offer in 2004

Pre-requisites: 24cp @ 300 level

Subject Description: Topics will be selected from areas of interest of staff members or visiting staff members to the School in the area of telecommunications. IT is a rapidly changing area. This subject will allow investigation into topics at the forefront of the discipline.

IACT441 IT Research Methodology 6cp

Autumn Wollongong On Campus

Contact Hours: 3 hours per week

Pre-requisites: WAM of 67.5 & approval from Head of School

Assessment: Annotated bibliography, Research proposal, Methodology - 40%; Exam - 40%; Workshop participation - 20%

Subject Description: IACT441 will cover the following topics on IT research methodology: What is Research (Purpose of thesis components); Research Methods; Literature Review - Critical Reading, Annotated bibliography and note taking; Survey Methods; Quantitative Methodologies (Results etc); Literature Review - Structure, Writing Up and Presentation Skills Satisfactory attendance at workshops is a requirement for the successful completion of this subject as is attendance at the Postgraduate Forum, held usually during week 8 of Autumn Session

IACT450 Research Report 18cp

Spring Wollongong On Campus

Pre-requisites: a grade of 75% or better in IACT441

Exclusions: IACT440

Subject Description: This is an Honours year subject of the BInfoTech degree, only available to students enrolled for honours from year 2000 onwards. It is a research project conducted under the supervision of academic staff in the school.

IACT451 IT Project 12cp

Not on offer in 2004

Prerequisites: IACT301 and IACT302 plus at least 12 credit points of 300 level subjects

Asessment: Problem definition and Project Plan (20%) Group Presentation/Seminar (10%) Project diaries (20%) Final report (50%)

Subject Description: This subject is a group project, conducted under the supervision of an academic staff member(s). Staff members will propose real-world IT projects ranging from the selection and implementation of IT to the development and implementation of software systems. Involves: project planning, group coordination, seminars and individual presentations, research of proposed application domain, preparation of reports and, depending on the project, various system development methodologies. Students will form teams, each of which will design, implement and document a solution to one of the proposed projects. Teams will meet weekly with supervisors to discuss progress and problems.

INFO202 Project 6cp

Annual	Wollongong	On Campus
Spring	Dubai	On Campus

(Feb-May 04)

Contact Hours: 2 hours Lecture/Tutorial per week for half each session

Pre-requisites: CSCI111 and ECTE195

Co-requisites: CSCI213 and ECTE291 or ECTE283

Exclusions: ECTE250

Assessment: See Subject Information Sheet those presented here are only a guide. Examination (Lecture Material) - 30%; Reports (one per team per session) - 30%; Presentations (two per session) - 20%; Project Deliverables (two per session) - 20%.

Subject Description: This subject is a multi-disciplinary group project in which students will form groups to design and implement a project which is related to internet science and technology. The project will be supervised by staff from the Faculty of Informatics.

INFO303 Advanced Project 12cp

Annual	Wollongong	On Campus
Autumn / Spring	Dubai	On Campus

(Sept 03-June 04)

Pre-requisites: INFO202, and WAM > 70 in level 200 subjects

Assessment: See Subject Information Sheet those presented here are only a guide. Examination (Lecture Material) - 30%; Reports (one per team per session) - 30%; Presentations (two per session) - 20%; Project Deliverables (two per session) - 20%.

Subject Description: This subject provides an opportunity for more capable students to do a group multi-disciplinary project in an area related to internet science and technology. It will allow students to learn how to communicate with one another in teamwork, in collaboratively executive a large internet related project.

INFO401 Mathematics and Finance 12cp
Honours Project

Annual	Wollongong	On Campus

Contact Hours: 2 hours per week

Pre-requisites: WAM greater than or equal to 67.5 after completing 144 cp of the course.

Assessment: Examination of written work, and a seminar.

Subject Description: This is a project conducted under the supervision of one or more relevant members of academic staff. The topic of the work is determined jointly by the student and supervisor.

INFO402 Mathematics and Economics 12cp
Honours Project

Annual	Wollongong	On Campus

Contact Hours: 2 hours week per week.

Pre-requisites: WAM greater than or equal to 67.5 after completing 144 cp of the course.

Assessment: Examination of written work, and a seminar.

Subject Description: This is a project conducted under the supervision of one or more relevant members of academic staff. The topic of the work is determined jointly by the student and supervisor.

INFO403 Computer Bioinformatics 24cp
Honours Project

Annual	Wollongong	On Campus

Contact Hours: 1 hour per week

Pre-requisites: WAM greater or equal to 67.5 after completing 144cp of the course

Restrictions: only available to Computer Bioinformatics candidates

Assessment: Examination of written work; Seminar presentation

Subject Description: This is a research project conducted under the supervision of one or more relevant members of academic staff. The topic of the work is determined jointly by the student and supervisor.

INFO411 Data Mining and Knowledge 6cp
Discovery

Spring	Wollongong	On Campus

Contact Hours: 2 hours per week

Pre-requisites: 36 cp (Knowledge of mathematical and statistical notation at an introductory level.)

Assessment: Projects and Assignments - 40%; Exam - 60%

Subject Description: Introduction to Data Mining and Knowledge Discovery, Data Bases and Warehouses, Data Structures, Exploratory Data Analysis Techniques, Association Rules, Artificial Neural Networks, Tree Based Methods, Clustering and Classification Methods, Regression Methods, Overfitting and Inferential Issues, Use of Data Mining packages.

INFO412 Mathematics for Cryptography 6cp

Autumn	Wollongong	On Campus

Contact Hours: 4 hours per week

Assessment: Assignments - 15%; Class Tests - 15%, Final Examination - 70%.

Subject Description: Logic: informal propositional logic, circuit theory. Natural Deduction style proofs in propositional & predicate logic. Interpretations & Models. Nonclassical logics. Number Theory: elementary number theory, modular exponentiation, discrete logarithms, Galois arithmetic & polynomials, error correcting codes & cryptography. Elliptic curves, groups for cryptography. Combinatorics: combinatorial probability, Knapsack problem, network and graph theory, combinatorial designs, game theory & linear programming applied to cryptography.

INFO413 Information Theory 6cp

Spring	Wollongong	On Campus

Contact Hours: 3 hours per week.

Pre-requisites: MATH121 or MATH122 or (MATH187 and MATH188), or (MATH141 and MATH142).

Assessment: Assignments - 16%, Test - 20%, Final Examination - 64%

Subject Description: The following is a selection of topics which may vary. The idea of probability, entropy, inequalities involving entropy, data compression, Huffman and Fano codes, information sources, McMillan's theorem, communication and capacity, block codes, Shannon's theorems, applications to other areas which may include communication, linguistics, genetics and financial investment.

ITCS201   Markup Languages   6cp

Autumn   Wollongong   On Campus

Contact Hours: 1 hr lecture, 2 hrs tutorial/ laboratory per week.

Asessment: Assignments - 70% Final exam - 30%

Subject Description: XML (eXtensible Markup Language) can be regarded as a language for creating other languages. In this capacity XML has rapidly become ubiquitous in very many diverse areas of IT and is now regarded as an essential core area of knowledge for every IT practitioner. The primary aims of this subject are to enable students to acquire practical proficiency in exploiting XML and to be able to explain the relevance of XML for many IT and Business contexts. In addition to being a new area of study, by studying XML students can extend or re-inforce their understanding of related study areas, e.g., the students can develop their understanding of data modelling and object-orientation (via XML schemas and XML transformations). As a secondary aim (a minor but relevant part of the subject) the subject will provide a basic practical proficiency in manipulating HTML and hence construction of elementary web pages.

ITCS301   Exploiting Collaborative Technologies 6cp

Not on offer in 2004

Prerequisites: 12 cp at 200 level in IACT or CSCI or ITCS

Asessment: Assignments - 70% Final exam - 30%

Subject Description: Students learn how to practically exploit Collaborative Technologies within eBusiness contexts. The concepts of Collaboration and the details of Collaborative Technologies will be investigated and explained from different eBusiness perspectives including the eBusiness Solutions perspective and the Patterns for eBusiness perspective. Examples of focus will include collaborative tools and techniques to support Knowledge Management and to support eLearning within an eBusiness solutions framework.Collaboration patterns will include modern variants of traditional categories including contextual (asynchronous) collaboration and interactive (synchronous) collaboration.Includes a practical focus ie a laboratory component that explores working with advanced collaborative applications including (for example) QuickPlace, Virtual Classroom, and various extensions to the J2EE (Java 2 Enterprise Edition) platform. The subject will exploit collaborative team approaches to practical assignts.

ITCS429   Concepts and Issues in Healthcare   6cp
            Computing

Spring   Wollongong   On Campus

Contact Hours: 1 hour lecture, 2 hour tutorial per week.

Pre-requisites: 24cp @ 300 level

Exclusions: IACT430 or IACT432 or IACT929

Assessment: Assignment 100%

Subject Description: This subject examines the essential concepts of health computing, limitations of technology, issues of privacy and security, economics of healthcare computing, managing healthcare computing projects, evaluation methods in medical informatics, knowledge engineering in health informatics, risk assessment in health informatics and the important issues involved in computer applications in healthcare.

ITCS430   Introduction to Health Informatics   6cp

Autumn   Wollongong   On Campus

Contact Hours: 1 hour Lecture, 2 hours Tutorial per week.

Pre-requisites: 24cp @ 300 level

Exclusions: IACT430 or IACT432 or ITCS930

Assessment: Assignment 100%

Subject Description: The subject covers clinical decision making and decision support systems and how health informatics and health information systems can assist. Topics include decision-making and decision-support systems in healthcare; the reasons for the necessity of systematically processing data, information and knowledge in medicine and healthcare; benefits and constraints of using information and communication technology; principles of practice evaluation and evidence-based care; evaluation methods; processing and evaluating information including analysis of business processes, bio-statistics and epidemiology; the application of statistics; computer concepts; characteristics of health information systems; healthcare systems; patient management; primary care systems and knowledge management.

ITCS431   Advance Web Application   6cp
            Development

Spring   Wollongong   On Campus

Contact Hours: 3 hours per week

Pre-requisites: 24cp @ 300 level

Assessment: Assignments Final exam

Subject Description: This subject is an advanced web applications development subject utilizing the visual basic integrated development environment. Requirements analysis and component solution architectures for e-commerce applications will be studied and solutions implemented utilizing advanced features of VB IDE. See Subject Outline for details

ITCS432   Web Design   6cp

Spring   Wollongong   On Campus

Contact Hours: 2 hours Lectures, 1 hour Lab

Pre-requisites: 24cp @300 level

Assessment: Assignments 100%

Subject Description: This subject introduces students to the design and programming of multi-tier web sites, where dynamic pages present data from databases. Programming will be done with frameworks, such as Apple Web Objects to create web applications that support dynamic web pages and object models of databases. Topics include the design and creation of user process, site architecture, elegant page layouts and simple site navigation. Pages will be designed and content created with professional web tools, such as Adobe web tools. Emphasis is placed on user process, good media design, clean architecture and efficient algorithms.

ITCS436   Detailed Design of Integrated   6cp
            Solutions for eBusiness

Spring   Wollongong   On Campus

Contact Hours: 3 hours per week

Prerequisites: IACT305 & CSCI213 or CSCI399 & CSCI213

Exclusions: ITCS450 or IACT406 or ITCS936

Assessment: Assignment 50%; Exam 50%

Subject Description: This subject develops the students' understanding of the system development process by taking the

student through all the phases of analysis design and construction of an eBusiness solution. The methods adopted provide an in-depth understanding of the logistical problems associated with gathering user requirements, and analysis and design, using the 'Patterns for eBusiness' method.

ITCS450   Patterns for eBusiness   6cp

Autumn   Wollongong   On Campus

Contact Hours: 3 hours per week

Pre-requisites: 12 cp at 200 level of IACT or CSCI

Exclusions: IACT406 or ITCS436 or CSCI370

Assessment: Assignments - 60%; Exam - 40%.

Subject Description: This subject explores advanced 'pattern-oriented' approaches to the design and development of eBusiness solutions. The 'Patterns for eBusiness' initiative provides a conceptual framework that can be exploited at all stages in the eBusiness software lifecycle.

In particular, this conceptual framework and vocabulary bridges the communications gap between business analysts and systems developers seeking to devise integrated solutions for eBusiness.

ITCS451   Web Services for Dynamic eBusiness 6cp

Spring   Wollongong   On Campus

Contact Hours: 3 hours per week

Pre-requisites: IACT305 or CSCI399

Exclusions: ITCS951

Assessment: Assignments - 60%; Exam - 40%.

Subject Description: Web Services are at the core of what is being termed the next generation of eBusiness. The term 'Web Services' refers to the set of standard protocols and associated technologies that enable software applications to communicate with each other across the Internet. To effectively exploit the potential of Web Services requires appropriate effort in the proper design of business processes and service architectures.

MATH110   Advanced Mathematics 1   6cp

Autumn/ Spring   Wollongong   On Campus

Contact Hours: 4 hours per week

Assessment: Assignments - 10%; mid-session test - 20 %; Final Examination - 70%.

Subject Description: Several areas of maths: Algebra (involves solving systems of equation using matrix methods, determinants and applications); Vector geometry (involves the idea of vectors and applications to geometry) Polar coordinates; Calculus (involves solution techniques for first and second order differential equations).

MATH111   Applied Mathematical Modelling 1   6cp

Spring   Wollongong   On Campus

Spring   Loftus   On Campus

Contact Hours: 6 hours per week

Prerequisites: Either a mark of at least 80 in MATH151 OR (in the NSW HSC Examination) Mathematics Band 4; or Mathematics Ext 1.**Co-requisites:** MATH188 or MATH142

Assessment: Laboratory Reports - 18%; Midsession Exam - 41%, Final examination - 41%.

Subject Description: Emphasises the physical, mathematical, numerical and computational aspects of the modern usage of Applied Mathematics in Science, Engineering and Industry. It is

strongly recommended for the students who are majoring in Industrial and Applied Mathematics. Real-world problems are tackled as idealised mathematical systems, the mathematical problem is solved and the results interpreted

MATH121   Discrete Mathematics   6cp

Autumn   Wollongong   On Campus

Autumn   Loftus   On Campus

Contact   Hours: 6   hours   per   week

Prerequisites: Either a mark of at least 80 in MATH151 OR (in the NSW HSC Examination) Mathematics Band 4; or Mathematics Ext 1.

Assessment: Assignments - 20%; Mid-Session Tests - 20%, Final Examination - 60%.

Subject Description: Students will be introduced to the spirit of mathematical inquiry and critical analysis, and encouraged to develop the ability to apply mathematical principles to the formulation and solution of problems. This is done through the use of non-calculus techniques, especially those of logic and number theory. This subject is well suited to computer science students.

MATH122   Probability and Logic   6cp

Spring/ Autumn   Dubai   On Campus

Autumn   Wollongong   On Campus

Contact Hours: 4 hours Lectures, 1 hour Tutorial per week

Exclusions: not to count with MATH121 or STAT131.

Assessment: Exam - 70%; Assignments - 30%

Subject Description: MATH122 consists of two sections: 1) Probability and Statistics: counting, modelling variability tree diagrams, conditional probability, discrete and continuous random variables, central limit theorem, statistical literacy. 2) Logic and Set Theory: propositional logic, truth tables, tautology, negation, algebraic laws, deduction, proofs, basic set theory, equivalence relations, functions, partial order, linear order.

MATH141   Mathematics 1C Part 1   6cp

Autumn   Wollongong   On Campus

Autumn   Loftus   On Campus

Contact Hours: 6 hours per week

Prerequisites: Either a mark of at least 65 in MATH151 OR in NSW HSC Examination: Mathematics - no minimum mark restriction

Exclusions: MATH101, MATH141 and MATH187 are not to count together.

Assessment: Assignments - 10%; Tests - 30%; Final Examination - 60%.

Subject Description: MATH141 is an alternative core subject for candidates whose HSC mathematics background is weaker than that required for MATH187. The aim of this subject is to develop ideas, concepts and skills in mathematics, especially applied skills, for application in later subjects. Main topics covered are matrix algebra, determinants, vectors, and differential and integral calculus. Computer Aided Learning modules on background material are available .

MATH142   Mathematics 1C Part 2   6cp

Spring   Wollongong   On Campus

Spring   Loftus   On Campus

Contact Hours: 6 hours per week

Pre-requisites: Either MATH141 or MATH161 OR a mark in the range 45 to 54 in MATH187

Exclusions: MATH101, MATH162 and MATH188 are not to count together.

Assessment: Assignments - 10%; Tutorial Quizzes - 10%; Mid-Session Test - 20%; Final Examination - 60%.

Subject Description: MATH142 is a core subject continuing on from MATH141. The aim of this subject is to develop ideas, concepts and skills, especially applied skills, in mathematics for application in later subjects. Main topics covered are further calculus, differential equations, numerical mathematics, sequences and series of numbers and complex numbers. Computer Aided Learning modules are available.

Students who do sufficiently well in MATH142 may proceed to relevant 200 level mathematics subjects.

MATH151   General Mathematics 1A   6cp

Autumn	Wollongong	On Campus
Summer 2004/05	Wollongong	On Campus

Contact Hours: 6 hours per week
Prerequisites: NSW HSC Examination: any mathematics- but enrolment is not permitted if the student achieved Mathematics Band 4 or better, or completed Mathematics Ext 1 or Ext 2.

Exclusions: Not to count with any one of MATH101, MATH141, MATH142, MATH187, or MATH188 unless satisfactorily completed prior to satisfactory completion of any of MATH101, MATH141, MATH142, MATH187, or MATH188 respectively.

Assessment: Tests - 30%; Final Examination - 70%.

Subject Description: MATH151 is intended for candidates registered for courses in the Faculty of Science who do not meet the pre-requisite for the subject MATH187. It introduces topics in algebra, trigonometry, co-ordinate geometry, vectors, functions, and calculus. The material is presented in a self-contained manner with a view to further applications in Science subjects.

MATH161   Mathematics 1E Part 1   6cp

Spring	Wollongong	Flexible

Prerequisites: Either a mark of at least 65 in MATH151 OR in NSW HSC Examination: Mathematics - no minimum mark restriction

Exclusions: Not to count with MATH101, MATH141, MATH143, MATH144, MATH187.

Assessment: Assignments 10%; In-Session Tests - 30%; Final Examination - 60%.

Subject Description: The content of MATH161 involves several areas of Mathematics. These areas are: Calculus which includes real functions, and an introduction to differentiation and integration; Polar co-ordinates; Algebra, which includes solving systems of equations using matrix methods, determinants and applications; and Vector Geometry, which involves vectors and their applications to geometry.

MATH162   Mathematics 1E Part 2   6cp

Summer 2004/05	Wollongong	Flexible

Pre-requisites: Either MATH161 or MATH141 or MATH187

Exclusions: Not to count with MATH101, MATH142, MATH143, MATH144, MATH188.

Assessment: Assignments - 10%; Tests - 30%; Final Examination - 60%.

Subject Description: The content of MATH162 involves several areas of Mathematics. These areas are: Calculus, which includes further integration, applications of integration, and first and second order differential equations; Complex Numbers; Further Calculus, which includes an elementary introduction to sequences and series and their convergence.

MATH187   Mathematics 1A Part 1   6cp

Autumn	Wollongong	On Campus
Autumn	Loftus	On Campus

Contact Hours: 6 hours per week

Prerequisites: Either a mark of at least 80 in MATH151 OR (in the NSW HSC Examination) Mathematics Band 4; or Mathematics Ext 1.

Exclusions: MATH101, MATH141 and MATH187 are not to count together.

Assessment: Assignments - 10%; Test - 20%; Final Examination - 70%.

Subject Description: The pair of subjects MATH187 and MATH188 make up the core for 100 level subjects. They are needed for most 200 level subjects in Mathematics and Applied Statistics. Students not wishing to proceed to 200 level mathematics may just study MATH187. MATH187 is available to students in all disciplines. This subject aims to develop ideas, concepts and skills in mathematics for application in subjects that require MATH187 as a co- or pre-requisite. Main topics are matrix algebra, determinants, vectors, and differential and integral calculus. Assistance is available for students with a weak background in mathematics.

MATH188   Mathematics 1A Part 2   6cp

Spring	Wollongong	On Campus
Spring	Loftus	On Campus

Contact Hours: 6 hours per week

Pre-requisites: Either MATH187 OR a mark of at least 65 in MATH141

Exclusions: MATH101, MATH142 and MATH188 are not to count together.

Assessment: Assignments - 10%; Test - 20%; Final Examination - 70%.

Subject Description: MATH188 is a core subject continuing on from MATH187. The aim of this subject is to develop ideas, concepts and skills in mathematics for application in later subjects. Main topics covered are further calculus, differential equations, sequences and series of numbers, numerical mathematics and complex numbers. This subject is required for most 200 level Mathematics and Applied Statistics subjects.

MATH201   Multivariate and Vector Calculus   6cp

Autumn	Wollongong	On Campus
Autumn	Loftus	On Campus

Contact Hours: 4 hours per week
Prerequisites: One of MATH101 or MATH188 or MATH283 or (a mark of at least 65 in MATH142 or MATH162) or enrolment in course code 762A.

Assessment: Assignments - 6%; Mid-Session Test - 34%, Final Examination - 60%; Lab Assignments Compulsory.

Subject Description: MATH201 is one of four core 200 level Mathematics subjects and is a prerequisite for many 300 level

subjects in Mathematics and Statistics. This subject extends the calculus of one variable to the calculus of more than one variable. Applications are given to maxima and minima, multiple integrals, vector calculus, line, surface and volume integrals, and to geometrical problems.

MATH202   Differential Equations 2   6cp

Spring   Wollongong   On Campus
Spring   Loftus   On Campus
Contact Hours: 4 hours per week

Prerequisites: One of MATH101 or MATH188 or (a mark of at least 65 in MATH142 or MATH162) or enrolment in course code 762A.

Co-requisites: MATH201

Assessment: Assignments - 22%; Mid-Session Test - 13%; Final Examination - 65%.

Subject Description: MATH202 is one of four core 200 level Mathematics subjects. This subject introduces the student to various special functions and differential equations and to techniques (both analytic and numerical) for their solution. Topics covered include exact first order equations, Gamma, Beta and Error functions, Laplace transforms, Fourier series, separation of variables for pde s, basic numerical techniques, computer packages, and comparative accuracy of numerical techniques.

MATH203   Linear Algebra   6cp

Autumn   Wollongong   On Campus
Contact Hours: 4 hours per week

Prerequisites: One of MATH101 or MATH188 or MATH283 or (a mark of at least 65 in MATH142 or MATH162) or enrolment in course code 762A.

Assessment: Assignments - 27%; Final examination - 70%; Tutorial/Lab Participation - 3%.

Subject Description: MATH203 is one of four core 200 level Mathematics subjects The study of systems of linear equations is important not only to mathematicians but also to scientists and engineers. Study of these systems is done both theoretically and numerically with geometrical interpretations given. It aims to build on students knowledge of matrix algebra and vector analysis.

MATH204   Complex Variables and Group   6cp
Theory

Spring   Wollongong   On Campus
Contact Hours: 4 hours per week

Prerequisites: One of MATH101 or MATH188 or (a mark of at least 65 in MATH142 or MATH162) or enrolment in course code 762A.

Co-requisites: MATH201

Assessment: Assignments - 10%; Mid-Session Test - 20%; Final Examination - 70%.

Subject Description: MATH204 is one of four core 200 level Mathematics subjects. It is of substantial value to science and other students. The study of Complex Variables extends the calculus of functions of a real variable to functions of a complex variable. Group Theory studies basic algebraic properties common to many mathematical systems and is currently applied in the areas of physics, geology and computer science.

MATH212   Applied Mathematical Modelling 2   6cp

Spring   Wollongong   On Campus
Contact Hours: 4 hours per week

Prerequisites: One of MATH101 or MATH188 or MATH283 or (a mark of at least 65 in MATH142 or MATH162) or enrolment in course code 762A.

Assessment: Mid-session Test - 30%; Final examination - 70%.

Subject Description: MATH212 is a subject in the applied mathematics strand. The subject provides insight into the process of Applied Mathematical Modelling in two important areas, heat transfer and Newtonian mechanics, though the modelling skills will be transferable to other areas. The main mathematical technique used is that of solving ordinary differential equations.

MATH222   Continuous and Finite Mathematics   6cp

Autumn   Wollongong   On Campus
Prerequisites: One of MATH101 or MATH188 or (a mark of at least 65 in MATH142 or MATH162) or enrolment in course code 762A.

Co-requisites: MATH201

Assessment: Assignments - 24%; Class Participation - 6%; Final examination - 70%.

Subject Description: MATH222 is for students who wish to continue in the mathematical analysis strand. Continuous Mathematics is concerned with the continuation of concepts introduced in first year calculus, including those of convergent sequence, continuous function and the integral of a function. Finite Mathematics is strictly independent of earlier work, but is related to first year algebra.

MATH235   Mathematics Project A   6cp

Autumn / Spring   Wollongong   On Campus
Contact Hours: 2 hours per week
Pre-requisites: 24 credit points at 100 level including MATH110

Restrictions: This subject is only for students enrolled in the BMath(Advanced) degree

Assessment: Projects - 60%; Test - 10%, Final Exam - 30%

Subject Description: The subject is a project individually chosen for the student, at a level appropriate to the 200 classification. The content may consist of (1) a placement in business or industry where substantial use is made of mathematical techniques; or (2) a project directed towards independent investigation by the student, written and/or oral presentations, and substantial interaction of the student with the supervisors of the project and other members of staff; or (3) a project directed to mastery of a mathematical package or language, with specific use of the package or language in some application or area of mathematics; or (4) a project of research collaboration with a member or members of staff, of which written and spoken presentation would be a part. Other projects which are appropriate but not primarily in one of these single categories may occur, such as a project combining features of (1) and (2).

MATH253   Linear Algebra   4cp

Autumn   Wollongong   On campus
Contact Hours: 4 hours per week

Pre-requisites: MATH188 a mark of at least 65 in MATH142.

Exclusions: MATH203

Assessment: Assignments - 27%; Final Examination - 70%; Tutorial/Lab Participation - 3%.

Subject Description: MATH253 is 2/3 of the subject MATH203. The aim of MATH253 is to build on students' knowledge of matrix algebra and vector analysis, and provide a strong foundation in the mathematics of linear algebra, with an appreciation of the applications that motivate it. The study of systems of linear equations is important not only to mathematicians but also to scientists and engineers. MATH253 will include study of these systems with geometrical interpretations being given. It includes vector spaces, subspaces, linear dependence, basis, dimension and inner product spaces. This will be followed by eigenvalues and eigenvectors and their central role to the diagonalization of matrices. Linear transformations and their basic properties will be discussed.

MATH283   Mathematics IIE for Engineers Part 1   6cp

Autumn   Wollongong   On Campus

Contact Hours: 4 hours per week

Pre-requisites: One of MATH101 or MATH142 or MATH144 or MATH162 or MATH188

Exclusions: Not to count with MATH202 or MATH261 or MATH281.

Assessment: Assignments - 20%; Mid-Session Test - 10%, Final Examination - 70%.

Subject Description: MATH283 is a subject for Bachelor of Engineering students. The subject consists of two topics, Differential Equations and Statistics. Each topic is worth 50% of the final mark. Differential Equations deals with new techniques, including the Laplace transform, Fourier series, and special functions (the gamma, beta and error functions). Statistics gives an introduction to statistical computing, and to basic statistical techniques, including mathematical models for describing variation in experimental situations.

MATH291   Differential Equations   3cp

Spring   Wollongong   On Campus

Contact Hours: 3 hours per week

Pre-requisites: MATH101 or MATH188 or a mark of at least 65 in MATH142.

Co-requisites: MATH201

Exclusions: Not to count with MATH202.

Assessment: As for MATH202. (Assignment 10%, test 20%, final exam 70%)

Subject Description: Linear second and higher order differential equations, solution of differential equations by Laplace transform methods. Fourier series, and some special functions (gamma, beta and error functions) will be introduced, together with an introductory solution method to boundary value problems (separation of variables).

MATH292   Numerical Analysis   3cp

Spring   Wollongong   On Campus

Pre-requisites: MATH101 or MATH188 or a mark of at least 65 in MATH142.

Co-requisites: MATH201

Assessment: As for MATH202. (Assignments - 20%, Test - 10%, Final Exam - 70%).

Subject Description: Basic numerical techniques for the solutions of differential equations, with application of computer packages, will also be covered. Students will also be expected to assess the comparative accuracy of these techniques.

MATH293   Complex Variables   4cp

Spring   Wollongong   On Campus

Contact Hours: 3 hours per week

Pre-requisites: One of MATH101 or MATH188 or a mark of at least 65 in MATH142.

Exclusions: Not to count MATH204.

Assessment: Assignment - 10%, Mid-Session Test - 20%, Final Examination - 70%

Subject Description: Complex functions, power series, analytic functions, Laurent series, singularities, residues, contour integration, Cauchy's theorem, Residue theorem and applications, conformal transformations.

MATH294   Group Theory   2cp

Spring   Wollongong   On Campus

Contact Hours: 3 hours per week

Pre-requisites: One of MATH101 or MATH188 or a mark of at least 65 in MATH142.

Exclusions: MATH204

Assessment: Assignments - 10%; Mid-Session Test - 20%; Final Examination 70%.

Subject Description: Group Theory consists of a careful study of the fundamental properties of groups using the following concepts: order, finite groups, subgroups, cosets, group homomorphisms and group isomorphisms. This study leads to an important result in Group Theory called Lagrange's theorem.

MATH302   Differential Equations 3   6cp

Spring   Wollongong   On Campus

Contact Hours: 3 hours per week

Pre-requisites: MATH283 or MATH202

Assessment: Assignments 10%, Mid-session test 20%, Final Examination 70%.

Subject Description: Many physical problems in the world are modelled with differential equations. This subject extends the knowledge of the student to various types of equations and to their solution. Techniques used widely in many areas of physical science are developed in this subject. Topics include Laplace and Fourier transforms, series solutions, and Hypergeometric and Bessel functions.

MATH305   Partial Differential Equations   6cp

Autumn   Wollongong   On Campus

Contact Hours: 3 hours per week

Pre-requisites: MATH201, 202 and 203

Assessment: Laboratory - 10%; Assignments -5%; Final Examination - 85%.

Subject Description: MATH305 is in a central area of mathematics, as many physical problems in the world are modelled with partial differential equations. Various types of equations and their solutions are discussed. As many equations cannot be solved in analytical form, numerical methods of solution also are considered. The aim is to develop high level mathematical ability and problem solving skills.

MATH312   Applied Mathematical Modelling 3   6cp

Autumn   Wollongong   On Campus

Contact Hours: 3 hours per week

Pre-requisites: MATH202 or (MATH283 and ENGG252)

Assessment: Assignments - 10%; Mid-Session Test - 20%, Final Examination - 70%.

Subject Description: MATH312 builds on work and knowledge originating in MATH111 and MATH212 and shows how to undertake mathematical modelling of many scientific and engineering processes and problems arising in industry. Main foci are: continuum mechanics, including deformation of materials; linear elasticity, including basic concepts of the stress-strain relation; and fluid mechanics.

MATH313   Industrial Mathematical Modelling   6cp

Spring   Wollongong   On Campus

Contact Hours: 3 hours per week

Pre-requisites: MATH202 or (MATH283 and MECH343)

Assessment: Case study project - 30%; Tutorial participation - 10%; Final examination - 60%.

Subject Description: MATH313 is designed to develop mathematical modelling skills by the examination of case studies relevant to industry. The basic equations are derived from first principles and used to study the transfer of mass and heat, diffusion, solidification and combustion.

In addition, the subject aims to improve oral presentation skills by making tutorial participation an assessable component of the subject.

MATH317   Financial Calculus and Logistics   6cp

Autumn   Wollongong   On Campus

Contact Hours: 3 hours per week

Pre-requisites: MATH202 and (STAT131 or STAT231)

Assessment: Assignments - 30%; Final examination - 70%.

Subject Description: MATH317 is an elective subject available to students enrolled in the degree courses primarily offered within this School. The subject consists of two sections: Financial Calculus: This is an introductory mathematical modelling course into the rapidly accelerating area of financial derivatives. It explores the properties of options and provides a theoretical framework within which these options can be valued and hedged. Logistics: This section introduces general principles of mathematical logistics, using inventory modelling as the main example.

MATH321   Numerical Analysis   6cp

Spring   Wollongong   On Campus

Contact Hours: 3 hours per week

Pre-requisites: MATH202 and MATH203

Assessment: Laboratory Reports - 20%; Assignments - 10%; Final Examination - 70%.

Subject Description: MATH321 is designed to extend the ideas developed in MATH202 and MATH203 as to how numerical and computational mathematics can be used to solve problems that have no analytic solution. The foci are problems in linear algebra and applications to real world problems. Specific techniques include algorithms for calculating eigenvalues and eigenvectors of a matrix.

MATH322   Algebra   6cp

Autumn   Wollongong   On Campus

Contact Hours: 3 hours per week

Pre-requisites: Either MATH204 or MATH222

Assessment: Assignments - 14%; Mid-Session Test - 16%; Final Examination - 70%.

Subject Description: MATH322 has been designed to develop clear and critical understanding, problem-solving skills and a capacity for rigorous argument. It builds on the group theory section of MATH204, and to a lesser extent upon the finite mathematics section of MATH222. An aim is to develop an appreciation of some of the concepts of modern algebra, including the work leading to the classification of finite simple groups completed around 1980.

MATH323   Topology and Chaos   6cp

Spring   Wollongong   On Campus

Contact Hours: 3 hours per week

Pre-requisites: MATH222

Assessment: Assignments - 30%; Final Examination - 70%.

Subject Description: MATH323 aims to develop critical understanding and problem-solving skills in the context of topology and chaos theory. It is intended to convey some of the impact of chaos theory in other areas and encourage interest of the student in phenomena such as the Koch curve. Some concepts discussed are notions of distance, dynamical systems, fractals and the Mandelbrot set.

MATH325   Wavelets   6cp

Not on offer in 2004

Prerequisites: MATH201 and MATH203;   MATH222 is desirable but not essential.

Asessment: Assignments 15%; mid-session exam 15%, Final examination 70%.

Subject Description: The theory of wavelets is a branch of mathematical analysis which has developed rapidly over the last 15 years. Wavelets are widely and increasingly important in applications, and at the same time their study permits an accessible introduction to some of the key ideas of modern mathematical analysis. Major topics covered include inner product spaces and the notion of convergence in inner product spaces, Hilbert spaces and Fourier series in Hilbert spaces, the Haar wavelet, and techniques for the construction and analysis of wavelets in general.

MATH345   Mathematics Project B   6cp

Autumn / Spring   Wollongong   On campus

Contact Hours: 3 hours per week

Pre-requisites: 24 credit points at 200 level

Restrictions: This subject is only for students enrolled in the BMath(Advanced) degree

Assessment: Assessment will depend upon the content and circumstances of the project, and will be specified in advance for each student. Assessment may include: (1) a written report; (2) a spoken presentation; (3) evaluation of performance in a business or industrial placement; (4) evaluation in part by examination; and (5) assignments

Subject Description: The subject is a project individually chosen for the student, at a level appropriate to the 300 classification. The content may consist of (1) a placement in business or industry where substantial use is made of mathematical techniques; or (2) a project directed towards

independent investigation by the student, written and/or oral presentations, and substantial interaction of the student with the supervisors of the project and other members of staff; or (3) a project directed to mastery of a mathematical package or language, with specific use of the package or language in some application or area of mathematics; or (4) a project of research collaboration with a member or members of staff, of which written and spoken presentation would be a part. Other projects which are appropriate but not primarily in one of these single categories may occur, such as a project combining features of (1) and (2).

MATH371 Special Topics in Industrial and Applied Mathematics 3 — 6cp

Spring / Autumn

Contact Hours: 3 hours per week

Assessment: Assessment methods will be determined after specification of objectives.

Subject Description: Entry to this subject is at the discretion of the Head of the School of Mathematics and Applied Statistics. This subject may not be offered in any particular year. MATH371 is one of a number of elective subjects available to students enrolled in the degree courses offered by the School. The aim of this subject is to provide students with specialist applied mathematical skills. Topics will be selected from the areas of interest of staff members of the School or visiting staff members.

MATH372 Special Topics in Mathematical Analysis 3 — 6cp

Autumn/ Spring   Wollongong   On Campus

Contact Hours: 3 hours per week

Pre-requisites: At discretion of Head of School

Assessment: Assessment methods will be determined after specification of objectives.

Subject Description: Entry to this subject is at the discretion of the Head of the School of Mathematics and Applied Statistics. This subject may not be offered in any particular year. MATH372 is one of a number of elective subjects available to students enrolled in the degree courses offered by the School. The aim of the subject is to provide students with advanced mathematical concepts and skills. Topics will be selected from the areas of interest of staff members of the School or visiting staff members.

MATH401 Mathematics 4 (Honours) — 48cp

Annual   Wollongong   On Campus

Contact Hours: 10 hours per week

Pre-requisites: At discretion of Head of School

Assessment: The coursework component is worth 70% of the total assessment in the subject MATH401. The Project is worth 30%.

Subject Description: A candidate must select 7 topics (a candidate may select 8 or more topics with approval from the Head of the School) from those on offer at the 400 level in Mathematics and Statistics. The topics are usually sessional, and a candidate will normally take 4 topics in one session, 3 in the other. With the approval of the Head of the School, up to 2 of these topics may be replaced by 300 level Mathematics and Statistics subjects that may be considered appropriate to complement a particular candidate's previous undergraduate studies. A candidate will complete a Project in an area of

interest under the close supervision of one or more members of staff of the School.

MATH411 Mathematical Sciences Honours Project A — 12cp

Annual   Wollongong   On Campus

Contact Hours: 8 hours per week

Pre-requisites: Subject to approval of head of school

Assessment: Report - 80%; Seminar - 20%.

Subject Description: MATH411 is a final year honours subject for Mathematics-Statistics/Science strand students. It is a project conducted under the supervision of one or more relevant members of academic staff. The aim is to provide students with mathematical skills which can be used effectively in scientific work.

MATH412 Mathematical Sciences Environmental Honours Project A — 12cp

Annual   Wollongong   On Campus

Contact Hours: 8 hours per week

Pre-requisites: Subject to approval of head of school

Assessment: Report - 80%; Seminar - 20%.

Subject Description: MATH412 is a final year honours subject for Mathematics/Geoscience and Mathematics/ Ecology strands students. It is a project conducted under the supervision of one or more relevant members of academic staff. The aim is to provide students with mathematical skills which can be used effectively in scientific work.

MATH471 Honours Topics in Mathematics A — 6cp

Spring / Autumn   Wollongong   On Campus

Contact Hours: 2 hours per week

Pre-requisites: Subject to approval of Head of School

Assessment: Assignments - 20%; Final Examination - 80%.

Subject Description: MATH471, MATH472, MATH473 and MATH474 are offered to BMathEcon, BMathFin, and BMathSc candidates. The aim of each of these subjects is to provide students with mathematical skills which can be used effectively in the relevant discipline. Students may be required to present some part of the course to the rest of the class, in a working seminar. The content is a topic from those offered in a particular year at 400-level within the subject MATH401, and which may vary from year to year.

MATH472 Honours Topics in Mathematics B — 6cp

Spring / Autumn   Wollongong   On Campus

Contact Hours: 2 hours per week

Assessment: Assignments - 20%; Final Examination - 80%.

Subject Description: MATH471, MATH472, MATH473 and MATH474 are offered to BMathEcon, BMathFin, and BMathSc candidates. The aim of each of these subjects is to provide students with mathematical skills which can be used effectively in the relevant discipline. Students may be required to present some part of the course to the rest of the class, in a working seminar. The content is a topic from those offered in a particular year at 400-level within the subject MATH401, and which may vary from year to year.

**STAT131   Understanding Variation and   6cp
               Uncertainty**

Autumn/ Spring   Wollongong   On Campus
Autumn   Loftus   On Campus
Contact Hours: 6 hours per week

Assessment: Assignments, Portfolio of In-Session work, Mid-Session Test - 50%; Examination - 50%

Subject Description: Variation and uncertainty occur in most aspects of life. Topics covered include Displaying variation and summarising data; Statistical computing and report writing; Probability Models: Markov Chains, binomial, Poisson; Modelling Uncertainty: Normal and other continuous distributions; Sampling Distributions - Central Limit Theorem; Inference - Point and Interval Estimation, Hypothesis Testing.

**STAT151   Introduction to the Concepts and   6cp
               Practice of Statistics**

Spring   Wollongong   On Campus
Contact Hours: 4 hours per week

Exclusions: Not to count with STAT131 or STAT252

Assessment: Assignments - 30%; Mid-Session Test and Summary - 10%; Final Examination - 60%

Subject Description: STAT151 enables students to understand the statistical content of articles in their own discipline. Includes exploratory data analysis; samples and populations; elementary probability; the Normal, binomial and Poisson distributions; estimation and confidence intervals; hypothesis testing for means, proportions and regression analysis; sensitivity and specificity.

STAT171   Understanding Variation and Risk   6cp
Not on offer in 2004
Assessment: Assignments, Portfolio of In-Session work, Mid-Session Test - 50%; Examination - 50%

Subject Description: Variation and uncertainty occur in most aspects of life. Topics covered include Displaying variation and summarising data; Statistical computing and report writing; Probability Models: Markov Chains, binomial, Poisson; Modelling Uncertainty: Normal and other continuous distributions; Sampling Distributions - Central Limit Theorem; Inference - Point and Interval Estimation, Hypothesis Testing.

STAT231   Probability and Random Variables   6cp

Autumn   Wollongong   On Campus
Contact Hours: 4 hours per week

Prerequisites: MATH188 or enrolment in course code 762A.

Assessment: Assignments - 20%; Examination - 80%

Subject Description: STAT231 applies statistical tools to the modelling and analysis of random experiments. Includes graphical and numerical data presentation; statistical computing; discrete random variables (binomial, geometric, hypergeometric and Poisson) and continuous random variables (uniform, Normal and gamma); expected values; transformations; moment generating functions; multivariate distributions; the Poisson process.

STAT232   Estimation and Hypothesis Testing   6cp

Spring   Wollongong   On Campus
Contact Hours: 4 hours per week

Pre-requisites: STAT231

Assessment: Assignments - 30%; Examination - 70%

Subject Description: STAT232 develops techniques of statistical inference and statistical analysis. The inference techniques are sampling distributions (such as chi-squared, t and F distributions), methods and criteria of estimation, and hypothesis testing. The analysis techniques are nonparametric testing (such as the sign, median and Wilcoxon tests), simple linear regression and one and two-way analysis of variance.

STAT235   Statistics Project A   6cp

Autumn/ Spring   Wollongong   On Campus
Contact Hours: 2 hours per week

Pre-requisites: 24 credit points at 100 level including MATH110

Restrictions: The subject is only for students enrolled in the BMath(Advanced) degree

Assessment: Assessment will depend upon the content and circumstances of the project, and will be specified in advance for each student. Assessment may include: (1) a written report; (2) a spoken presentation; (3) evaluation of performance in a business or industrial placement; (4) evaluation in part by examination; and (5) assignments

Subject Description: The subject is a project individually chosen for the student, at a level appropriate to the 200 classification. The content may consist of: (1) a placement in business or industry where substantial use is made of statistical techniques; or (2) a project directed towards independent investigation by the student, written and/or oral presentations, and substantial interaction of the student with the supervisors of the project and other members of staff; or (3) a project directed to mastery of a statistical package or language, with specific use of the package or language in some application or area of statistics; or (4) a project of research collaboration with a member or members of staff, of which written and spoken presentation would be a part. Other projects which are appropriate but not primarily in one of these single categories may occur, such as a project combining features of (1) and (2) above.

STAT252   Statistics for the Natural Sciences   6cp

Spring   Wollongong   On Campus
Contact Hours: 4 hours per week

Pre-requisites: 24 credit points

Exclusions: Not to count with STAT131 or STAT151 or STAT231 or STAT232 or PSYC232

Assessment: Assignments - 30%; Mid-session Test and Summary - 10%; Final examination - 60%

Subject Description: STAT252 provides an introduction to statistical techniques. Topics covered are: data presentation; probability, binomial and Poisson distributions; Normal distribution; inference for single samples; comparison of two samples; analysis of variance and multiple comparisons; linear regression and correlation; goodness-of-fit testing and contingency tables.

STAT291   Engineering Statistics   3cp

Autumn   Wollongong   On Campus

Contact Hours: 3 hours per week

Pre-requisites: MATH142 or MATH188

Exclusions: Not to count with STAT231.

Subject Description: (Part of MATH283) In this topic, methods of collecting and summarising data are discussed. Statistical inference methods concerning population means, proportions and variances are given. Linear and multiple regression methods are used to develop mathematical relationships among variables and to predict variables of interest. Some basic advantages of using experimental planning are discussed. Latin square and randomised block experimental designs are discussed. Students will be introduced to a major statistical package.

**STAT304   Operations Research and Applied   6cp
             Probability**

Spring   Wollongong   On Campus

Contact Hours: 3 hours per week

Pre-requisites: Either (MATH188 and [STAT131 or STAT231]) or MATH283

Assessment: Assignments - 30%; Examination - 70%.

Subject Description: The operations research component includes linear programming, simplex algorithm, duality, sensitivity analysis, transportation and assignment problems, integer programming, and use of computer software. The applied probability component includes Markov chains, birth and death processes and queuing theory.

STAT332   Multiple Regression and Time Series   6cp

Spring   Wollongong   On Campus

Contact Hours: 3 hours per week

Pre-requisites: STAT232

Assessment: Assignments 40%; Examination 60%

Subject Description: STAT332 is an advanced course covering relationships between variables and the analysis of observational studies and designed experiments. Topics covered include multiple linear regression, non-linear regression, generalised linear regression, ARIMA models, forecasting of time series and Box-Jenkin's approach.

**STAT333   Statistical Inference and Multivariate   6cp
             Analysis**

Autumn   Wollongong   On Campus

Contact Hours: 3 hours per week

Pre-requisites: STAT232

Assessment: Assignments 25%; Examination 75%.

Subject Description: STAT333 covers inference (estimation and hypothesis testing) in both one and many dimensions. Topics covered include transformations, maximum likelihood and minimum variance unbiased estimation, the likelihood ratio, score and Wald tests, vector random variables, the multivariate Normal distribution, principal components analysis, factor analysis and discriminant analysis.

**STAT335   Sample Surveys and Experimental   6cp
             Design**

Autumn   Wollongong   On Campus

Contact Hours: 3 hours per week

Pre-requisites: STAT232 or STAT252 at Credit level or better, or STAT151 at Credit level or better, or PSYC232 at Credit level or better, or ECON121 at Credit or better, or (STAT131 & STAT231 both at Credit or better)

Assessment: Assignments - 25%; Examination - 75%.

Subject Description: STAT335 develops skills in designing and analysing statistical investigations. Statistical computing is an essential part of the course. Topics covered: Experimental designs: completely randomised, randomised complete block, Latin Square, factorial; the analysis of the data arising from these designs. Steps in conducting a sample survey; methods such as simple random sampling and stratified sampling, number raised and ratio estimation.

STAT345   Statistics Project B   6cp

Autumn / Spring   Wollongong   On Campus

Contact Hours: 3 hours per week

Pre-requisites: 24 credit points at 200 level

Restrictions: The subject is only for students enrolled in the BMath(Advanced) degree

Assessment: Assessment will depend upon the content and circumstances of the project, and will be specified in advance for each student. Assessment may include: (1) a written report; (2) a spoken presentation; (3) evaluation of performance in a business or industrial placement; (4) evaluation in part by examination; (5) assignments.

Subject Description: The subject is a project individually chosen for the student, at a level appropriate to the 300 classification. The content may consist of (1) a placement in business or industry where substantial use is made of statistical techniques; or (2) a project directed towards independent investigation by the student, written and/or oral presentations, and substantial interaction of the student with the supervisors of the project and other members of staff; or (3) a project directed to mastery of a statistical package or language, with specific use of the package or language in some application or area of statistics; or (4) a project of research collaboration with a member or members of staff, of which written and spoken presentation would be a part. Other projects which are appropriate but not primarily in one of these single categories may occur, such as a project combining features of (1) and (2) above.

**STAT355   Sample Surveys and Experimental   8cp
             Design (with Project)**

Autumn   Wollongong   On Campus

Contact Hours: 2 hours Lectures, 1 hour Tutorial per week plus consultation with supervisor

Pre-requisites: STAT232 or STAT252 at Credit level or better, or STAT151 at Credit level or better, or PSYC232 at Credit level or better, or ECON121 at Credit or better, or (STAT131 & STAT231 both at Credit or better)

Exclusions: STAT335

Assessment: Assignments 20%;   Project 25%; Examination 55%. (Note: students should expect to work on the project for 4 hours per week all session).

Subject Description: STAT355 develops skills in designing and analysing statistical investigations. Statistical computing is

an essential part of the course. Topics covered: Experimental designs: completely randomised, randomised complete block, Latin Square, factorial; the analysis of the data arising from these designs. Steps in conducting a sample survey; methods such as simple random sampling and stratified sampling, number raised and ratio estimation.

STAT373   Special Topics in Probability and   6cp
Statistics 3

Spring / Autumn   Wollongong   On Campus

Contact Hours: 3 hours per week

Pre-requisites: Entry to this subject is at the discretion of the Head of the School of Mathematics and Applied Statistics. This subject may not be offered in any particular year.

Assessment: A combination of assignments, projects, mid-session and examination.

Subject Description: STAT373 will be available at the discretion of the head of the School. Topics will be selected from areas of expertise of visiting staff members, or from other subjects offered by the School of Mathematics and Applied Statistics.

STAT383   Statistics For Engineers   4cp
Not on offer in 2004

Assessment: Assignments and In-Session work - 30%; Examination - 70%.

Subject Description: STAT383 develops the capability to understand and apply appropriate statistical tools. Topics covered include methods of collecting and summarising data; statistical inference concerning population means, proportions and variances; linear and multiple regression; basic advantages of using experimental planning; experimental designs: randomised block, Latin square designs, factorial experiments.

STAT401   Statistics 4 (Honours)   48cp

Annual   Wollongong   On Campus

Contact Hours: 10 hours per week

Pre-requisites: At least 36 cp of maths 300 level subjects, and the approval of the Head of School.

Assessment: Coursework - 70%; Project - 30%.

Subject Description: The subject consists of two components, one being coursework, the other a project.br Coursework Requirements: A candidate must select seven topics from those on offer at the 400 level in Statistics and Mathematics to satisfy the requirements of this part of the course. The topics are usually sessional, and a candidate will normally take four topics in one session and three in the other. With the approval of the Head of the School, up to two of these topics may be replaced by 300 level Statistics and Mathematics subjects that may be considered appropriate to complement a particular candidate's previous undergraduate studies.

STAT411   Mathematical Sciences Honours   12cp
Project B

Annual   Wollongong   On Campus

Contact Hours: 2 hours week

Pre-requisites: Subject to approval by Head of School

Assessment: Seminar - 70%; Project Report - 30%.

Subject Description: STAT411 and STAT412 are only offered to BMathSc candidates. Students will acquire statistical skills which can be used effectively in scientific work. These subjects

are projects conducted under the supervision of one or more relevant members of academic staff.

STAT412   Mathematical Sciences   12cp
Environmental Honours Project B

Annual   Wollongong   On Campus

Contact Hours: 2 hours per week

Pre-requisites: Subject to approval of Head of School

Assessment: Seminar - 70%; Project Report - 30%.

Subject Description: STAT411 and STAT412 are only offered to BMathSc candidates. Students will acquire statistical skills which can be used effectively in scientific work. These subjects are projects conducted under the supervision of one or more relevant members of academic staff.

STAT413   Mathematical Sciences Public Health 12cp
Honours Project B

Annual   Wollongong   On Campus

Contact Hours: 2 hrs per week.

Prerequisites: Subject to approval of Head of School

Asessment: Seminar 70%; Project Report 30%.

Subject Description: STAT411, 412 and STAT413 are only offered to BMathSc candidates. Students will acquire statistical skills which can be used effectively in scientific work. These subjects are projects conducted under the supervision of one or more relevant members of academic staff.

STAT471   Honours Topics in Statistics A   6cp

Autumn/ Spring   Wollongong   On Campus

Contact Hours: 2 hours per week

Pre-requisites: MATH188

Assessment: Assignments - 25%; Examination - 75%.

Subject Description: STAT471, STAT472, STAT473 and STAT474 are only offered to BMathFin, BMathEcon and BMathSc candidates. Students will acquire statistical skills which can be used effectively in scientific work. A topic from those offered in a particular year at 400-level within the subject STAT401, and which may vary from year to year.

STAT472   Honours Topics in Statistics B   6cp

Autumn/ Spring   Wollongong   On Campus

Contact Hours: 2 hours per week

Pre-requisites: MATH188

Assessment: Assignments - 25%; Examination - 75%.

Subject Description: STAT471, STAT472, STAT473 and STAT474 are only offered to BMathFin, BMathEcon and BMathSc candidates. Students will acquire statistical skills which can be used effectively in scientific work. A topic from those offered in a particular year at 400-level within the subject STAT401, and which may vary from year to year.

STAT473   Honours Topics in Statistics C   6cp

Autumn/ Spring   Wollongong   On Campus

Contact Hours: 2 hours per week

Pre-requisites: MATH188

Assessment: Assignments - 25%; Examination - 75%

Subject Description: STAT471, STAT472, STAT473 and STAT474 are only offered to BMathFin, BMathEcon and

BMathSc candidates. Students will acquire statistical skills which can be used effectively in scientific work.

A topic from those offered in a particular year at 400-level within the subject STAT401, and which may vary from year to year.

STAT474   Honours Topics in Statistics D   6cp

Autumn/ Spring   Wollongong   On Campus

Contact Hours: 2 hours per week

Pre-requisites: MATH188

Assessment: Assignments - 25%; Examination - 75%.

Subject Description: STAT471, STAT472, STAT473 and STAT474 are only offered to BMathFin, BMathEcon and BMathSc candidates. Students will acquire statistical skills which can be used effectively in scientific work. A topic from those offered in a particular year at 400-level within the subject STAT401, and which may vary from year to year.