

Courses Description 2003 - 2005

ELEC 806 Industrial Electrical Design

UOC6 HPW3 UGRD

Excluded:

PreRequisite:

"This course deals with the fundamentals of Electrical Engineering relevant to Industrial Design. Without going into great detail or building on the ultimate physical properties of matter, the course will often use the concept of electrons. That, together with everyday knowledge of electrical applications, will be the starting point. On completion the student will have knowledge of some useful topics including the terminology of Electrical Engineering; which electric motor to choose depending on its application; Electrical Safety; Standards. The syllabus covers Ohm's law, concepts of AC and DC voltage and current, the basics of transformers, motors and electromechanical product systems, electromagnetic interference, shielding and earthing."

ELEC 807 Electrical Engineering 1E

UOC6 HPW4 UGRD

Excluded:

PreRequisite: PHYS1169 or PHYS1002 or PHYS1918.

"Circuit theory: analysis and design of DC and AC circuits, comprising various energy sources and complex impedances, 3 phase circuits. Laboratory methods: electrical safety, transformers and motors, signal generators, measuring devices, oscilloscopes. Instrumentation: operational amplifiers, sensors, simple signal processing, AC machines and DC machines."

ELEC 809 Electrical Engineering 1C

UOC3 HPW3 UGRD

Excluded:

PreRequisite: PHYS1169 or PHYS1002 or PHYS1918.

"Circuit theory: analysis and design of DC and AC circuits, comprising various energy sources and complex impedances, 3-phase circuits. Laboratory methods: electrical safety, signal generators, measuring devices, oscilloscopes. Transformers and AC machines and induction motors. DC machines and motors."

ELEC 1010 Introduction to Electrical Engineering

UOC3 HPW3 UGRD

Excluded:

PreRequisite:

"The lecture program for this course has three themes. The first lectures provide an introduction to the practice of electrical engineering. Key skills and knowledge in safety, technical communication and information gathering are discussed. Also covered are issues of what engineers do, the wider context in which engineers operate and their obligations to society. Several lectures also explore the key engineering theme of engineering system. Many of the latter course lectures will be given by guest speakers from industry, and will introduce you to the world of electrical engineering. Your ability to learn from and summarise the visitors' lectures will be included in the material assessed in the examination. A number of lectures will also be given by different lecturers from the School of Electrical Engineering and Telecommunications covering key areas including power systems, control, telecommunications and electronics."

ELEC 1011 Electrical Engineering 1

UOC6 HPW6 UGRD

Excluded:

PreRequisite:

Passive electrical components. Electric circuit concepts and relationship to field theory. Kirchhoff's laws. Node and mesh analysis of resistive networks. Network theorems. Controlled sources. Transient conditions. Sources of periodic signals. Average and r.m.s. values. Circuit models of diodes and transistors. Combinational logic principles and circuits.

ELEC 1111 Electrical and Telecommunications Engineering

Excluded:

UOC6 HPW6 UGRD

PreRequisite:

An introduction to the art and science of Electrical Engineering and Telecommunications, and the systems approach to engineering design. Examples of electrical and electronic devices, circuits and analogue and digital systems. Analogue circuit analysis. Digital electronics and combinatorial logic. Transformers, power sources and electrical energy systems including DC and AC motors. Feedback control. Telecommunications systems, including frequency, spectra, modulation and Internet systems. Safety standards.

ELEC 1041 Digital Circuits
UOC6 HPW4 UGRD

Excluded:

PreRequisite: ELEC1011

"Realisations of combinational circuits: MSI devices, ROM's, PLA's. Synchronous sequential logic circuits: latches, flip flops, counters, registers. Algorithmic state machines: systematic design procedures, ITDLS. Asynchronous sequential logic circuits, design applications. PLD s, & FPGA's."

ELEC 2015 Electromagnetic Applications
UOC3 HPW3 UGRD

Excluded:

PreRequisite: PHYS2939 or PHYS2949.

General field properties. Electric and magnetic fields. Inductance and capacitance. Dielectric and magnetic materials and their applications. Electrodynamic forces. Transformer and motor action: rotating magnetic fields. Dielectric and induction heating. Applications of Maxwells equation. Transmission lines from circuit and electromagnetic viewpoints. Electromagnetic radiation. Some health and regulatory considerations.

ELEC 2031 Circuits and Systems
UOC3 HPW3 UGRD

Excluded:

PreRequisite: ELEC1011

Revision of basic circuit theory; RLC circuits; operational amplifiers; mutual inductance and transformers; state space modelling of systems with particular reference to circuits; Laplace transforms in general and applied to solution of state equations and circuit transient problems; two-port networks; assignments involving an introduction to PSPICE and MATLAB.

ELEC 2032 Electronics and Systems
UOC3 HPW3 UGRD

Excluded:

PreRequisite: ELEC2031

"Revision of basic circuit theory; RLC circuits; sinusoidal circuit response; mutual inductance and transformers; operational amplifiers; computer aided circuit design; state space circuit representations and time responses; homogenous and particular solutions for first and second order linear differential equations; computer aided analysis of signals and systems, including state space representations; continuous time signals, sinusoidal and signal norms; convolution, impulse and step responses; phasors; AC circuits (transient and steady state responses); complex power; frequency responses of circuits and systems; three-phase circuits."

ELEC 2041 Microprocessors and Interfacing
UOC6 HPW4 UGRD

Excluded:

PreRequisite: (COMP1011 and ELEC1041) or (COMP1011 and COMP2021)

"An introduction to programmer model of computer organisation, including assembly and machine language. Process of translation of computer programs including high level language to assembly, assembly to machine instructions, compilers, assemblers, linkers and loaders. Number representation including computer arithmetic, signed, unsigned and floating point arithmetic. Data types and data structures, including character: integers, structures, arrays. Instruction set including instruction type and cycles, data processing, load/store and branch instructions, addressing modes. Functions, including functions calling conventions, instruction set support for functions, stack frames. I/O interfacing, I/O interrupts, and programming interrupts, instructions support for I/O and interrupts, and OS support for interrupt and I/O interfacing. Memory hierarchy; including cache, main memory, virtual memory and memory management unit. Bus system including memory bus, I/O device buses, and arbitration."

ELEC 2042 Real Time Instrumentation
UOC3 HPW3 UGRD

Excluded:

PreRequisite: (ELEC1041 and COMP1021) or (SOLA1051 and ELEC1041)

"Discrete time systems: representation of discrete time signals, digital filters, simple difference equations and discrete time responses, computer representation of digital systems using object oriented programming, data abstraction. Hardware requirements for real time applications: system model of the computer, process-related interfaces (digital, analog, clocks), scaling, data transfer (polling, interrupts). Software development: real time specification standards, state machines. Simple real time kernels: state machine multi-tasking, co-routines, interrupts, foreground/background systems. Systems theory and controller design: differential equations, transfer functions, state-space, PID control, numerical methods."

ELEC 3004 Signal Processing and Transform Methods

UOC6 HPW5 UGRD

Excluded:

PreRequisite: ELEC2032.

"The mathematics of signals and linear systems. Fourier series, Fourier and Laplace transforms, discrete Fourier and Z transforms. Processing and analysis of continuous (analogue) and discrete-time (digital) signals. Analogue filters: approximation theory, Butterworth, Bessel, Chebyshev and elliptic filters. Filter impulse and frequency responses, stability, and sensitivity. Sampling continuous signals: the sampling theorem, reconstruction, and aliasing. The discrete Fourier transform (DFT) and the fast Fourier transform (FFT). Fundamentals of the design and realisation of finite impulse response (FIR) and infinite impulse response (IIR) digital filters. Digital processing of analog signals, including applications of digital signal processing (DSP) and programmable DSP chips. The representation and modelling of non-deterministic (random) signals, correlation functions, and power density spectra."

ELEC 3005 Electric Energy 1

UOC6 HPW5 UGRD

Excluded:

PreRequisite: ELEC2015

"Introduction to energy systems; three-phase circuits, overview of electricity generation, transmission, distribution storage and utilisation. Transformers: equivalent circuit, elimination of harmonics. Thermal rating of equipment. Electrical machines: fundamentals and applications of DC and AC machines. Small electrical machines. Introduction to power electronics: single- and three-phase switching of electrical power. Heat generation in and effects on electrical equipment. Insulation systems and deterioration, mathematical model of heat source and risk. Heat transfer by conduction, convection and radiation. Dynamic temperature behaviour and intermittent ratings of equipment."

ELEC 3006 Electronics A

UOC6 HPW5 UGRD

Excluded:

PreRequisite: ELEC2032.

"Frequency analysis of amplifiers. Design and analysis of feedback amplifiers. Amplifier stability analysis. Operational amplifiers and comparators. Schmidt triggers. Waveform generators: sinusoidal, square, triangular. A-D and D-A converters."

ELEC 3014 Systems and Control 1

UOC6 HPW5 UGRD

Excluded:

PreRequisite: ELEC2032.

History of feedback control; Differential equations; Laplace transforms; Transfer functions; Poles & Zeros; State space models; Modelling mechanical systems; First and second order systems; Block diagram algebra; Signal flow graphs; Mason's rule; Stability; Routh-Hurwitz criterion; Steady state errors; Root locus theory and sketching; Generalized root locus/Transient response design via gain adjustment/Pole sensitivity/ Design via root locus; PID control; Lag-lead compensation; Bode plots/Nyquist plots/Nyquist stability criterion/Gain margin and phase margin/Time delay; M&N circles/Nichols chart/ Introduction to design via frequency response; Practical classes include Matlab tutorials linked to lectures and construction and testing of DC servo motor feedback control systems.

ELEC 3015 Electric Energy 2

UOC6 HPW4 UGRD

Excluded:

PreRequisite: ELEC3005

"Basic aspects of both the supply and utilisation of electrical energy, with some emphasis on contemporary aspects of energy utilisation, including modern developments, energy efficiency and environmental aspects. Electrical energy supply systems: transmission and distribution systems, power transfer, reactive power effects, fault current calculation and protection. Quality of electricity supply; transient overvoltages, harmonics and their ramifications in the operation of electrical power equipment. Electromagnetic compatibility (EMC). Utilisation of electrical energy: industrial application considerations, including DC machines, induction and synchronous motor drives. computer-aided analysis of machines. Use of modern techniques of Power Electronics for application to variable speed drive systems, including DC-AC, DC-DC and AC-AC converters. Utilisation of electrical energy for lighting and industrial heating processes including discharge, induction and RF heating. Electrical safety of power equipment: equipment requirements for use in hazardous atmospheres; earthing and earth leakage protection."

ELEC 3016 Electronics B

UOC6 HPW4 UGRD

Excluded:

PreRequisite: ELEC3006

"Operating principles and fabrication technologies of electronic and photonic devices. Devices covered include: pn diodes, BJTs, MOSFETs, LEDs, solar cells, lasers and optical waveguides as used in communication systems and microwave devices. Ebers-Moll model of the BJT. BJT & MOSFETs in analogue and integrated circuits, including TTL, ECL and CMOS. Principles and key technologies involved in microfabrication of integrated circuits. Non-idealities of devices resulting from realistic architectures and the effect of these non-idealities on the operation and design of circuits and systems."

ELEC 3017 Electrical Engineering Design

UOC6 HPW5 UGRD

Excluded:

PreRequisite: ELEC2032 and ELEC2041

"Electrical product design in a manufacturing environment, from original idea through technical specifications, prototype, manufacture and finally to marketing. In particular: Design Project Management: Introduction to scheduling and other management techniques. Also introductions to costing, pricing, marketing, standards, patents, quality and reliability, safety, (electronic) manufacturing methods and systems, engineering innovation. Design Methodology: Systematic design procedures, design documentation. Designing for quality, for manufacture, for maintenance, for minimum life cycle cost. Use of computer aids for project management, drawing, PCB design, circuit analysis and synthesis, documentation. Engineering Drawing and Graphical Communications: Standards, projections, dimensioning, tolerancing, and drawing interpretation. Aspects of Electronic Design: Device specifications, component choices, sourcing, data sheets, tolerances, aging, thermal dissipation, passive component characteristics. Also RFI and EMC, earthing, shielding, PCB layout principles, prototyping methods, interconnection technologies. Group Project: including specification, marketing and business plans, scheduling, design, prototype production, testing, formal technical report and seminar presentation."

ELEC 3041 Real Time Engineering

UOC6 HPW4 UGRD

Excluded:

PreRequisite: ELEC2042

"Real-Time Systems: real-time versus non real-time; hard/soft and critical/non-critical real-time systems; events and stimuli; processes, tasks and threads; concurrent processes; software architectures; state machines. Real-Time Kernels: Scheduling algorithms; co-routines and multi-tasking inter-process communication and synchronisation; context switching; task management; reliability, testing and fault tolerance; timing analysis; device drivers. Real-Time Linux: POSIX and Linux; loadable kernel modules; inter-process communication; interrupts; shared memory and RT-FIFO's. Embedded Systems: Real-time kernels for embedded systems; Motorola 68HC11; MXC11 real-time executive."

ELEC 3402 Introductory Physiology for Engineers

UOC6 HPW4 UGRD

Excluded:

PreRequisite: ELEC2032.

"An introduction to biophysics and physiology for engineers. Cells, tissues and organ systems with emphasis on their functional and regulatory characteristics and their interaction. An introduction to computer models of physiological control systems demonstrating their value in understanding the dynamics of complex neural, hormonal and circulatory responses to changes in homeostasis."

ELEC 4010 Project Management for Professional Services

UOC3 HPW4 UGRD

Excluded:

PreRequisite: 96 units of credit

"The purpose of this course is to provide students with fundamental insights and tools for project management in the provision of professional services. Lectures will cover the Projectised Organisation, planning processes, project execution and ongoing project management. Other topics include negotiation, organizational strategy development, human resources and effective communications."

ELEC 4011 Ethics and Electrical Engineering Practice

UOC3 HPW2 UGRD

Excluded:

PreRequisite: 120 units of credit.

"An introduction to the nature of ethical systems; the application of ethical bases to engineering practice with particular reference to electrical engineering and computing; codes of ethics in the professions, with special reference to the Code of Ethics of the Institution of Engineers, Australia; social, political, environmental and economic considerations. Students are required to complete a minimum of 60 days of industrial training with one or more companies, preferably before the commencement of this course. The objectives of industrial training are (i) to develop an appreciation for the structure and operation of industrial organisations, (ii) to understand the role of the engineer and engineering in industry, (iii) to appreciate the importance of good communication and interpersonal skills, and to develop these skills, and (iv) to appreciate the ethical basis of engineering practice in industry. Students are required to submit to the School evidence from their employers of each period of training confirming the work performed, together with a report. The report, typically 2000-3000 words long, should summarise the actual technical work performed, and should address the extent to which the aims of the industrial training have been met. It is preferred that some industrial training should be obtained in Australia. When the industrial training is done overseas, the report should include a more detailed description of the company concerned."

ELEC 4042 Signal Processing 2

UOC6 HPW4 UGRD

Excluded: ELEC9342

PreRequisite: ELEC3004

"Digital Oscillators. Decimation and interpolation. Frequency-Sampling Filters, Comb filters. Advanced design of digital filters and their implementation in Matlab. Discrete Fourier transform (DFT). Fast transform (FFT) algorithms. Wavelet Transform (WT). Comparison between FFT and WT. Multirate Systems. Quadrature-Mirror Filter Bank, Multilevel Filter Banks, Polyphase Decomposition. FIR Lattice filters, All-pole IIR Lattice filters and their implementation. Adaptive filters. Least square filter design. inverse filtering. Wiener filters, Noise reduction. Linear prediction and the Levinson algorithm. Analysis of Finite-word length effects. Limit Cycles. Round-off noise. Nonstationary Signal Processing."

ELEC 4205 Electrical Energy Systems

UOC6 HPW4 UGRD

Excluded:

PreRequisite: ELEC3005

"Review of the basic concepts used in power system analysis: phasors, complex power, three phase systems and per-unit methodology. Modelling of power system components, including transformers and synchronous machines. Aspects of power system operation, including power flow, reactive power control and fault analysis. Harmonics and their effects. Choice and use of protective equipment, including fuses, circuit breakers, relays and surge arresters. Equipment rating for operation in steady state and cyclic modes. Overvoltages and their effect in power systems. Insulation system design and practical limitations. Insulation coordination. High voltage equipment testing methods and their use in insulation condition monitoring of electrical energy systems. Quality of supply."

ELEC 4216 Electrical Drive Systems

UOC6 HPW4 UGRD

Excluded: ELEC9231

PreRequisite: ELEC3005

"Electrical Drive Systems. Elements of Drive systems and their requirements for servo and industrial drive applications. Drive representation, quadrant operation, dynamic and regenerative braking. Transfer function representations of dc motor and converter and drive performance analysis. Performance analysis of induction motor drives with variable voltage, voltage source, current source and variable frequency supply. Performance analysis of synchronous and reluctance motors with variable frequency supply. Transducers in electric drive systems. The analysis of asymmetrically connected induction motors. Unified machine theory. Computer aided design and analysis."

ELEC 4240 Power Electronics

UOC6 HPW4 UGRD

Excluded: ELEC9240

PreRequisite: ELEC3006

"Modern power semiconductor devices eg, diodes, thyristors, MOSFETs, and other insulated gate devices such as the IGBT, MCT and the FCT. Static and switching characteristics, gate drive and protection techniques. Various DC-DC, AC-DC, DC-AC and AC-AC converter circuit topologies, their characteristics and control techniques. Application considerations for remote and uninterruptible power supplies, and for computer systems, telecommunications, automobiles, traction and other industrial processes. Utility interaction, harmonic distortion, and power factor. EMI and EMC considerations."

ELEC 4412 Control of Continuous-time Systems

UOC6 HPW4 UGRD

Excluded:

PreRequisite: ELEC3014

"Design of controllers for multivariable dynamical systems (e.g., design of an automatic pilot for an aircraft). State space theory. Design of linear controllers using the polynomial approach and the Diophantine theorem. Continuous-time state space design methods for MIMO systems. Principal gains, shaping system performance, optimal control methods, Linear Quadratic Gaussian (LQG) controllers and Kalman filters."

ELEC 4413 Control of Discrete-time Systems

UOC6 HPW4 UGRD

Excluded:

PreRequisite: ELEC3014

Covers the design of practical control systems intended for implementation using digital computers and embedded systems. Controllers may be developed using both continuous and discrete designs. The topics covered include: identification of model parameters; numerical integration and implementation of continuous designs; observers; discrete systems; stability analysis; observability and controllability; design of digital controller pole placement; nonlinear systems; Aspects of implementation are constantly emphasised.

ELEC 4444 New Business Creation

UOC6 HPW4 UGRD

Excluded:

PreRequisite: 138 units of credit.

"In the new economic environment, graduates must be better prepared to take control of their own employment futures which increasingly must include the option of entrepreneurship and the creation and growth of one's own company. For those graduates with a technical or engineering background, the new technology based firm offers extremely large potential to create jobs and wealth. The course provides the final year student with a clear understanding of the venture creation process with particular emphasis on technology-based ventures. A range of skills are developed relating to R&D management, intellectual property, technology contracts, product development, marketing, financial management and business planning. As a result, it is expected that this course could be the first step for a number of its attendees to progress to active involvement in new technology based firms either in Australia or internationally."

ELEC 4483 "Biomedical Instrumentation, Measurement and Design"

UOC6 HPW4 UGRD

Excluded:

PreRequisite: ELEC3004

"Design and development of biomedical instrumentation for clinical measurement and biomedical research. Hardware and software design issues required to produce instruments which satisfy Australian and International standards for safety, performance and quality control. Tutorials and laboratories will be closely integrated so that design and analysis carried in tutorial sessions will be followed by testing and development in the laboratory sessions. A design project and/or case study will also be required as part of this course."

ELEC 4503 Electronics C

UOC6 HPW4 UGRD

Excluded:

PreRequisite: ELEC3006

"Advanced analog circuit techniques for signal processing and interfacing. Active filters characteristics and design techniques. Realisation of active filters: continuous time RC and op amp circuits. Switched capacitor filters. Analog multipliers and their application in modulation, demodulation, gain control and phase comparison. The phase-locked loop: Phase detectors, VCO design, lock and capture processes. Applications. Low noise amplifier design. Power amplifiers; class A, class B, class C efficiency and linearity."

ELEC 4522 Microelectronics Design and Technology

UOC6 HPW4 UGRD

Excluded:

PreRequisite: ELEC3006

"Review of technology for bipolar and MOS integrated circuits. Device models, layout rules. Analog circuit building blocks. Bipolar and CMOS operational amplifiers. CMOS logic. MOS Analog-Digital and Digital-Analog converters. Memory - DRAM/SRAM. Yield, reliability, failure analysis techniques and packaging. The laboratory program is aimed at understanding the internal design of some standard IC functions."

ELEC 4532 Integrated Digital Systems

UOC6 HPW4 UGRD

Excluded:

PreRequisite: ELEC1041 or COMP2021

"Integrated circuit logic families with emphasis on MOS technologies, structured chip design, custom and semi-custom approaches, system architecture, computer aided design, layout considerations, timing estimates, circuit failures, faults, fault modelling, testing, design for testability."

ELEC 4910 Thesis Part A

UOC3 HPW4 UGRD

Excluded:

PreRequisite: "132 units of credit and weighted average mark of 65, and ELEC3017."

"The thesis (PartsA&B) is carried out in the last two sessions of the BE degree course. Under the guidance of a supervisor, directed laboratory and research work on an approved topic is carried out. Generally, the thesis involves the design and construction of experimental apparatus, software simulations or models with laboratory tests. Each student is required to present a seminar as part of the requirements for ELEC4910. Thesis Part A involves a detailed literature search and reviews of the background for the thesis topic and planning the activities that will require for Part B."

ELEC 4911 Thesis Part B
UOC9 HPW10 UGRD

Excluded:

PreRequisite: ELEC4910.

"The thesis (PartsA&B) is carried out in the last two sessions of the BE degree course. Under the guidance of a supervisor, directed laboratory and research work on an approved topic is carried out. Generally, the thesis involves the design and construction of experimental apparatus, software simulations or models with laboratory tests. Each student is required to present a seminar as part of the requirements for ELEC4910. Thesis Part B typically involves the detailed theoretical development or modelling work. A written thesis report must be submitted on the thesis topic by Tuesday of Week 14 of the session in which ELEC4911 is taken."

ELEC 4914 Group Thesis Part A
UOC3 HPW4 UGRD

Excluded:

PreRequisite: ELEC3017 and 132 units of credit.

"The group thesis (PartsA&B) is carried out in the last two sessions of the BE degree course. Under the guidance of a supervisor, directed laboratory and research work on an approved topic is carried out. Generally, the thesis involves the design and construction of experimental apparatus, software simulations or models with laboratory tests. Each student is required to present a seminar as part of the requirements for ELEC4914. Group Thesis Part A involves a detailed literature search and reviews of the background for the thesis topic and planning the activities that will be required for Group Thesis Part B."

ELEC 4915 Group Thesis Part B
UOC9 HPW10 UGRD

Excluded:

PreRequisite: ELEC4914

"The group thesis PartA&B is carried out in the last two sessions of the BE degree course. It is carried out by a group of between two and five students working on various aspects of a particular topic. Under the guidance of a supervisor, directed laboratory and other research work on an approved topic is carried out. Generally, the project involves the design and construction of experimental apparatus, software simulations or models with laboratory tests. Each student group is required to present a seminar as part of the requirements for ELEC4914. Group Thesis Part B typically involves the detailed theoretical development or modelling. A written thesis report must be submitted on the project by Tuesday of Week 14 of the session in which ELEC4915 is taken."

PHTN 1010 Introduction to Photonics
UOC3 HPW3 UGRD

Excluded:

PreRequisite:

The lecture program for this course has three themes. The first lectures provide an introduction to the practice of photonics engineering. Key skills and knowledge in safety, technical communication and information gathering are discussed. Also covered are issues of what engineers do, the wider context in which engineers operate and their obligations to society. Several lectures also explore the key engineering theme of engineering systems. Many of the latter course lectures will be given by guest speakers from industry, and will introduce you to the world of Telecommunications and photonics engineering. Your ability to learn from and summarise the visitors' lectures will be included in the material assessed in the examination. A number of lectures will also be given by different lecturers from the School of Electrical Engineering and Telecommunications covering basic communications theory, photonics, computing, data networks, the Internet, electronics and communications systems.

TELE 1010 Introduction to Telecommunications
UOC3 HPW3 UGRD

Excluded:

PreRequisite:

"The lecture program for this course has three themes. The first lectures provide an introduction to the practice of telecommunications engineering. Key skills and knowledge in safety, technical communication and information gathering are discussed. Also covered are issues of what engineers do, the wider context in which engineers operate and their obligations to society. Several lectures also explore the key engineering theme of engineering systems. Many of the latter course lectures will be given by guest speakers from industry, and will introduce you to the world of telecommunications engineering. Your ability to learn from and summarise the visitors' lectures will be included in the material assessed in the examination. A number of lectures will also be given by different lecturers from the School of Electrical Engineering and Telecommunications covering basic communications theory, computing, data networks, the Internet, electronics and communications systems."

TELE 3013 Telecommunication Systems 1
UOC6 HPW4 UGRD

Excluded:

PreRequisite: ELEC2032.

"To present a general introduction to telecommunications aspects such as signal acquisition, transmission and processing in communication systems. This subject is intended for telecommunication engineering students as a necessary background, and also for electrical or computer engineering students not specialising in telecommunications as a general knowledge. Characteristics of typical communication channels. Typical signals (speech, audio, video, data) and their characteristics. Basic analogue and digital techniques. Key techniques in handling transmission system issues (modulation, coding, multiplexing. System performance and evaluation (channel noise, intersymbol interference, error rate). Major communication systems including telephony, radio, TV, satellite, mobile phone, optical fibre, radar and networks."

TELE 3015 High Frequency Electromagnetics

UOC3 HPW3 UGRD

Excluded:

PreRequisite: PHYS2939 or PHYS2949.

"Maxwell equations & electromagnetic waves; polarisation & TEM waves; plane & spherical waves. Interference principles. Energy & power in waves. Group velocity dispersion & group delay. Dielectric materials & transmission; conducting materials & shielding; nonlinear interactions; anisotropic materials. Transmission lines from circuit & electromagnetic viewpoints; transmission line circuits. Metallic & dielectric waveguides; waveguide modes. Dipole, array, dish & aperture antennas. Some health & environmental considerations."

TELE 3018 Data Networks 1

UOC6 HPW4 UGRD

Excluded:

PreRequisite: COMP1021 and ELEC1041.

"An overview of computer networks. Basic concepts in the physical layer: signals and data, transmission media, data encoding schemes. Issues in the data link layer: Error correction and detection, flow and error control and shared medium access schemes. Concepts in the network layer introduction to the Internet Protocol (IP), IP addressing, classical IP subnetting technique and IP routing. Transport layer concepts: introduction to the Transport Control Protocol (TCP) and User Datagram Protocol (UDP). The operation of the different Internet applications: HTTP, DNS, FTP, SMTP and Internet multimedia streaming applications."

TELE 4313 Optical Communications

UOC6 HPW4 UGRD

Excluded: ELEC9350 and ELEC8350

PreRequisite: TELE3013;

"Wave propagation in optical fibres. Gaussian approximation of fields in single-mode fibre, spot-size, equivalent step index fibres. Material, waveguide and intermodal dispersion. Polarisation and birefringent fibres. Ray theory in multimode fibre. Optical fibre measurement and characterisation. Launching efficiencies in fibres. Fibre-based devices. Nonlinear and anisotropic effects."

TELE 4323 Digital Modulation and Coding

UOC6 HPW4 UGRD

Excluded:

PreRequisite: TELE3013

"Brief review of key concepts from signal processing, linear systems, sampling theory and source coding. Digital transmission through AWGN channels. Baseband signalling and pulse shaping. Carrier amplitude, phase and frequency modulation techniques. Spread spectrum modulation. Carrier and clock synchronisation. Channel capacity. Forward error correction coding. Applications of these techniques in typical digital communications systems."

TELE 4333 Wireless Data Communication Systems

UOC6 HPW4 UGRD

Excluded: TELE9343

PreRequisite: TELE3013;

"Introduction to wireless technologies. First, second and third generation wireless networks. MAC technologies for wireless, packet switching circuit switching, burst switching. Radio resource allocation and cellular systems. GSM architecture: routing and flow control protocols, mobility management. High-speed circuit-switched data (HSCSD) services. General Packet Radio Service (GPRS). Enhanced data for global evolution (EDGE) and global third generation (G3G). Wireless local area network (WLANs) - IEEE 802.11 and Hiperlan standards. Broadband wireless access (BWA). Application of wireless services. Future wireless services and software radios."

TELE 4343 Source Coding and Compression

UOC6 HPW4 UGRD

Excluded:

PreRequisite: "TELE3013 and ELEC3004"

"Characteristics of analogue information sources (speech, audio, images, video). Sampling methods. Scalar and vector quantisation. Information and entropy. Elementary coding tools. Lossless compression methods. Lossy compression and distortion measures. Rate-distortion analysis and optimization. Basic waveform coding methods: PCM, DM, DPCM, etc.. Advanced waveform coding methods: linear transforms, including DCT and subband/Wavelet transforms; and predictive methods. Non-waveform methods, including vocoders and frequency domain methods. Major coding methods and standards for speech, audio, images and video. Embedded/progressive coding with applications in modern communication systems. Real time transmission of speech, audio and video in telecommunication systems, including fixed and variable bit rate coding."

TELE 4352 Data Networks 2

UOC6 HPW4 UGRD

Excluded: TELE9302

PreRequisite: TELE3018;

"Design, analyse and evaluation performance. Effectiveness, cost and customer control. Personal Communication Services (PCs), Frame Relay, Asynchronous Transfer Mode (ATM), SONET/SDH and Switched Multimegabit Data Services (SMDS). Protocol modelling and verification techniques. Asynchronous Transfer Mode (ATM). ATM LANs, multimedia communication. Analysis of protocols for data link, network and transport layers. Network design. Frame Relay. Switched Multimegabit Data Services (SMDS). Operating system views of communication."

TELE 4353 Mobile and Satellite Communication Systems

UOC6 HPW4 UGRD

Excluded: TELE9344.

PreRequisite: TELE3013;

Modern communication systems from a systems point of view. Cellular mobile communication systems. Propagation-loss model. The mobile fading channel. Multiple access techniques. The GSM. Digital satellite communication systems. Satellite orbits. Station keeping. Multiple access techniques. System synchronisation. DAMA. Satellite packet communication. Mobile satellite networks.

TELE 4354 Network Management

UOC6 HPW4 UGRD

Excluded: TELE9303

PreRequisite: TELE3018;

"This course will introduce students to methods, techniques and tools for the management of telecommunication systems and networks with specific examples from Internet and the public switched telecommunication networks. It will introduce the fundamental concepts of SNMP. Then it will examine QOS management mechanisms and mobility management in IP networks. Finally it examines the concepts of content distribution networks."

TELE 4363 Telecommunications Systems 2

UOC6 HPW4 UGRD

Excluded: TELE9301

PreRequisite: TELE3013;

"This course provides a fundamental coverage of important communication systems, their basic components, as well as legal and commercial aspects affecting the design and operation of these systems. This subject is intended for students who wish to major in telecommunications or strengthen their knowledge of modern communication systems. Basic principles of guided and unguided wave propagation. Transmission aspects of voice telephony, digital networks signalling, CCITT signaling system no.7, Asynchronous Transfer Mode (ATM), Advanced Broadband Digital Transport Formats. Broadcast radio and TV systems. Cable systems. Introduction to mobile and satellite communications."

TELE 4910 Thesis Part A

UOC3 HPW4 UGRD

Excluded:

PreRequisite: "132 units of credit and weighted average mark of 65 and ELEC3017."

"The thesis (Parts A&B) is carried out in the last two sessions of the BE degree course. Under the guidance of a supervisor, directed laboratory and research work on an approved topic is carried out. Generally, the thesis involves the design and construction of experimental apparatus, software simulations or models with laboratory tests. Each student is required to present a seminar as part of the requirements for TELE4910. Thesis Part A involves a detailed literature search and reviews of the background for the thesis topic and planning the activities that will require for Part B."

TELE 4911 Thesis Part B

UOC9 HPW10 UGRD

Excluded:

PreRequisite: TELE4910.

"The thesis (Parts A&B) is carried out in the last two sessions of the BE degree course. Under the guidance of a supervisor, directed laboratory and research work on an approved topic is carried out. Generally, the thesis involves the design and construction of experimental apparatus, software simulations or models with laboratory tests. Each student is required to present a seminar as part of the requirements for TELE4910. Thesis Part B typically involves the detailed theoretical development or modelling work. A written thesis report must be submitted on the thesis topic by Tuesday of Week 14 of the session in which TELE4911 is taken."

TELE 4914 Group Thesis Part A

UOC3 HPW4 UGRD

Excluded:

PreRequisite: ELEC3017 and 132 units of credit.

"The group thesis (PartsA&B) is carried out in the last two sessions of the BE degree course. Under the guidance of a supervisor, directed laboratory and research work on an approved topic is carried out. Generally, the thesis involves the design and construction of experimental apparatus, software simulations or models with laboratory tests. Each student is required to present a seminar as part of the requirements for TELE4914. Group Thesis Part A involves a detailed literature search and reviews of the background for the thesis topic and planning the activities that will required for Group Thesis Part B."

TELE 4915 Group Thesis Part B

UOC9 HPW10 UGRD

Excluded:

PreRequisite: TELE4914

"The group thesis (PartsA&B) is carried out in the last two sessions of the BE degree course. Under the guidance of a supervisor, directed laboratory and research work on an approved topic is carried out. Generally, the thesis involves the design and construction of experimental apparatus, software simulations or models with laboratory tests. Each student is required to present a seminar as part of the requirements for TELE4914. Thesis Part B typically involves the detailed theoretical development or modelling work. A written thesis report must be submitted on the thesis topic by Tuesday of Week 14 of the session in which TELE4915 is taken."