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| 4171CSD  Semester 1  *Electronic and electrical engineering* | The Smart Environment  (20c) | *Aim:*  In a modern society, we live our lives in a digital world of interconnected smart devices and computing technology. This module sets the scene for this smart environment, which affects us all and introduces the underlying principles of the technologies and infrastructures upon which it relies. | *Learning activities:*  A series of structured lectures, workshops and practical tasks will provide a varied range of learning activities. | *Assessment:*  Report (70%) Lab (30%) |
| 4200AMP  Semester 1  *Electronic and electrical engineering* | Computer Audio Technology  (20c) | *Aim:*  To explain how computers capture, process and store digital audio and performance data and explore the systems used to enable this. To illustrate the hardware and software that is used in computer-based audio and music production. To explore the techniques used to edit and manipulate digital audio and musical performance data. To utilise the various activities and skills required during the typical workflow stages of computer-based audio production. | *Learning activities:*  Lectures will be accompanied by workshop-based demonstration sessions and hands-on practical sessions. Theoretical knowledge will be assessed in guided tutorial sessions. Extensive use of the Blackboard VLE will be made to provide additional reading resources and example source code and audio files. | *Assessment:*  Examination (50%) Production of an audio book (50%) |
| 4201AMP  Semester 1  *Electronic and electrical engineering* | The Media Industry  (10c) | *Aim:*  To develop the student as an effective, self-motivated life-long learner. The study, personal and generic skills are applied and developed in other Level 4 modules, and provide a platform-reflective learning experience and foundation for study at higher levels and subsequent careers. | *Learning activities:*  This module contextualises students’ production practice by introducing them to the ways in which both media and music institutions within the creative and cultural industries are organised. The module will explore and examine key issues in the history and current organisation of, and possible changes in, the cultural industries as institutions and practices. Students will also cover the essential aspects of the Personal Development Plan (PDP). This will include the practice of personal development planning, in the context of undergraduate studies, and encourage students to start actively planning for their academic and career development. | *Assessment:*  Portfolio of evidence (80%) Reflection for Bronze Skills (20%) |
| 4202AMP  Semester 1  *Electronic and electrical engineering* | Spreadsheets and Data Presentation  (10c) | *Aim:*  To provide an audio production student with a rudimentary knowledge of fundamental maths, statistics and data analysis, using spreadsheet formulae and graphs, integrated within a technical report. | *Learning activities:*  Lectures, tutorials and practical sessions | *Assessment:*  Portfolio of evidence (100%) |
| 4204AMP  Semester 1  *Electronic and electrical engineering* | Practical Audio Production  (20c) | *Aim:*  To introduce students to the practical issues arising from Recording audio and Live sound reinforcement | *Learning activities:*  Practical sessions and demonstrations including student work groups | *Assessment:*  Perc recording and manip (50%) Audio equipment (50%) |
| 4207AMP  Semester 1  *Electronic and electrical engineering* | Computing and Video Tools  (20c) | *Aim:*  The module introduces the students to aspects of optics and computing which are central to the equipment required to operate in this field. | *Learning activities:*  Lectures, Practical sessions and demonstrations. | *Assessment:*  Class Test (40%) Video Based Assessment (60%) |
| 4208AMP  Semester 1  *Electronic and electrical engineering* | Video Acquisition  (20c) | *Aim:*  To introduce students to professional technical and craft practices as used in broadcast media and creative industries, including: managing and organising tasks, people and resources; working to specifications; and applying safe systems of work. | *Learning activities:*  Practical sessions and demonstrations. Student work groups. | *Assessment:*  Video Production (60%) Equipment Competence (40%) |
| 4301ELE  Semester 1  *Electronic and electrical engineering* | Engineering Principles  (20c) | *Aim:*  This module is intended to provide students with a good appreciation of  - the physical properties and behaviours that influence electrical systems,  - how parameters are measured  - communications systems | *Learning activities:*  A series of lectures and tutorials | *Assessment:*  Exam (60%) Online exercises (40%) |
| 4303ELE  Semester 1  *Electronic and electrical engineering* | Electrical Circuit Principles  (20c) | *Aim:*  To enhance knowledge and understanding of the essential mathematics underpinning electrical and electronic engineering.  To develop intellectual abilities in selecting and applying appropriate circuit analysis techniques for analysing various electrical and electronic circuits.  To introduce passive electronic components and understand there operating characteristics.  To introduce the operating principles of transformers and electronic filters. | *Learning activities:*  A series of lectures supported by tutorials and on-line exercises | *Assessment:*  Exam (60%) Series of on-line quizzes (40%) |
| 4315ELE  Semester 1  *Electronic and electrical engineering* | Engineering Mathematics 1a  (20c) | *Aim:*  To provide a foundation in engineering mathematics for its application to the solution of engineering problems | *Learning activities:*  A combination of lectures and tutorials. | *Assessment:*  Online Assessment (100%) |
| 5171CSD  Semester 1  *Electronic and electrical engineering* | Mobile Devices & Wireless Technology  (20c) | *Aim:*  The modern world is a connected world. One where people can interact and expect to control and manage their lives remotely, wherever they may be. Smartphones and other tablet computers have driven that need to shop, bank, control the home environment, stream music and TV programmes and other limitless application, at a time when you want to. This module will explore those mobile devices and the wireless communications technologies that enable it all to happen. | *Learning activities:*  A series of structured lectures, tutorials and practical tasks will provide a varied range of learning activities. | *Assessment:*  Report (70%) Lab (30%) |
| 5172CSD  Semester 1  *Electronic and electrical engineering* | Sensor Technology  (20c) | *Aim:*  Mobile devices rely on a whole range of sensing technologies to provide the raft of functionality we now expect from our smartphones and tablets. Modern devices are packed full of hidden sensors that allow us to use our phones to make purchases, take perfect photographs, change the orientation of the screen and to determine which direction to take with a satnav. This module will help us to understand how these sensors work and how we can use them for the benefit of society. | *Learning activities:*  A series of structured lectures, tutorials and practical tasks will provide a varied range of learning activities. | *Assessment:*  Report (70%) Lab (30%) |
| 5200AMP  Semester 1  *Electronic and electrical engineering* | Audio Recording  (20c) | *Aim:*  To enhance students’ knowledge of the equipment used in a Recording Studio and hence address the practical issues arising from recording using a control surface. Also to allow students to gain experience in using both hardware and software audio devices deployed in digital audio recording | *Learning activities:*  Practical sessions and demonstrations including student work groups | *Assessment:*  Studio equipment levels (50%) Glynn Johns method (50%) |
| 5201AMP  Semester 1  *Electronic and electrical engineering* | Broadcast Standards  (20c) | *Aim:*  To explain the nature and composition of primarily baseband broadcast quality  signals; to describe the operation of (and standards required for) broadcast  equipment to recognised professional industry practice. | *Learning activities:*  Attend all lectures, tutorial and practical sessions.  Engage with on-line learning materials via Blackboard.  Research and produce the output for the practical assignment | *Assessment:*  Signal measurements (50%) Examination (50%) |
| 5202AMP  Semester 1  *Electronic and electrical engineering* | The Media Entrepreneur  (20c) | *Aim:*  To enable the student to develop the managerial skills and commercial awareness required to research and create a media-related enterprise or event by organising people, resources and time. | *Learning activities:*  This module is delivered by means of lectures and workshop. | *Assessment:*  Develop an Enterprise Plan (70%) Pitch the Plan to an Audience (30%) |
| 5301ELE  Semester 1  *Electronic and electrical engineering* | Digital and Embedded Systems  (20c) | *Aim:*  The module aims to broaden the students' knowledge and understanding of digital circuit design, and examines modern microcontroller architectures and the interface requirements to external systems. It also aims to provide students with practical skills necessary to design, analyse and implement electronic circuits controlled by microcontrollers and finite state machines | *Learning activities:*  Lecture, demonstration and practical activities applying topics discussed. | *Assessment:*  Exam (70%) D&E Systems Assignment (30%) |
| 5305ELE  Semester 1  *Electronic and electrical engineering* | Control System Design and Analysis  (20c) | *Aim:*  To develop an understanding of components and the principles of control systems, basic design and analysis techniques, and practice some control applications to industrial systems. | *Learning activities:*  By a series of lectures, tutorials and computer simulations. | *Assessment:*  Exam (60%) Report (40%) |
| 5312ELE  Semester 1  *Electronic and electrical engineering* | Applied Instrumentation  (20c) | *Aim:*  To introduce the students to a graphical based programming language that enables  the user to program via a CAD style environment enabling them to create virtual  instruments as a base for data acquisition and instrument control. | *Learning activities:*  By a series of seminars and practical sessions. Students will be encouraged to work  independently. | *Assessment:*  Design Assignment 1 (25%) Mini Project (75%) |
| 5321ELE  Semester 1  *Electronic and electrical engineering* | Engineering Mathematics 2  (10c) | *Aim:*  To provide a foundation in engineering mathematics for application to the solution of engineering problems | *Learning activities:*  A combination of lectures and tutorials | *Assessment:*  Online assessment (100%) |
| 6200AMP  Semester 1  *Electronic and electrical engineering* | Music Video Production  (20c) | *Aim:*  To research, design, plan and manage the creation of a scripted narrative music video to a client brief.  To enable the student to develop the video craft skills which complement existing audio learning, whilst managing all aspects of the video production process including client liaison, pre- and post-production to the mastering of the final product. | *Learning activities:*  This module will be delivered by a combination of lectures and workshops. | *Assessment:*  Documentation: client research (60%) Music Video (40%) |
| 6201AMP  Semester 1  *Electronic and electrical engineering* | Devices, Apps and Streaming  (20c) | *Aim:*  To introduce techniques used to distribute multimedia information. | *Learning activities:*  Lectures, Labs and Tutorials | *Assessment:*  Report (30%) Implementation (70%) |
| 6202AMP  Semester 1  *Electronic and electrical engineering* | Project Preparation  (10c) | *Aim:*  To prepare the students to undertake their own media-related projects and to deliver the required skill set for successful completion of their investigations. | *Learning activities:*  Lectures and tutorials, as well as discussions with the Project Supervisor. | *Assessment:*  Terms of reference (100%) |
| 6203AMP  Semester 1  *Electronic and electrical engineering* | Career Management  (10c) | *Aim:*  To provide Audio and Music Production students with the confidence, skills and knowledge to make realistic, well-informed career and lifestyle choices, and with the ability to review and adapt their plans in the light of changing priorities and circumstances. To develop independent learning skills by offering access to diverse experiences. | *Learning activities:*  Engage with on-line learning experiences and materials.  Use web-based research resources.  Network directly with local/national Audio Engineering employers.  Take part in workshops.  Practice interview techniques  Research and produce three written assignments | *Assessment:*  Portfolio of career material (100%) |
| 6206AMP  Semester 1  *Electronic and electrical engineering* | Virtual Digital Studio  (20c) | *Aim:*  To develop a virtual 3D studio package and integrate with live footage within a TV studio environment. | *Learning activities:*  Content is delivered through targeted lectures and a number of practical activities. The practical work will consist of both individual work and group work within the TV studio. | *Assessment:*  Portfolio (100%) |
| 6300ELE  Semester 1  *Electronic and electrical engineering* | Automation  (10c) | *Aim:*  To develop the students’ knowledge and understanding of automation systems used in manufacturing and process industries | *Learning activities:*  By a combination of lectures and laboratory design exercises | *Assessment:*  Portfolio of Evidence (100%) |
| 6303ELE  Semester 1  *Electronic and electrical engineering* | Industrial Networks  (10c) | *Aim:*  To develop the students’ knowledge and understanding of networks used in industrial automation systems | *Learning activities:*  By a combination of lectures and tutorial exercises. | *Assessment:*  Exam (100%) |
| 6312ELE  Semester 1  *Electronic and electrical engineering* | Process Control  (20c) | *Aim:*  To appreciate the problems associated with the design of closed-loop control of process systems. To understand the principles of cascade, feedforward and ratio control. To analyse non-linear process systems, systems containing large dead-time and coupled multi-loop systems. | *Learning activities:*  Lectures, tutorials and design based laboratory activities. | *Assessment:*  Examination (70%) Design Assignment (30%) |
| 7000AMP  Semester 1  *Electronic and electrical engineering* | Audio Forensics Theory and Practice  (30c) | *Aim:*  To provide students with a comprehensive understanding of the theory, processes and techniques in the emerging field of Audio Forensics  To equip the student with knowledge and understanding to critically analyse, select and apply appropriate techniques to transcode, authenticate enhance, interpret and report on forensic audio investigations | *Learning activities:*  Lectures, practical sessions and demonstrations including measurement and calculation procedures | *Assessment:*  Test (25%) Investigation (25%) Interpretation (50%) |
| 7001MSC  Semester 1  *Electronic and electrical engineering* | Research Skills  (10c) | *Aim:*  The aims of this module are to prepare the students to undertake their own research projects and to deliver the required skill set for successful completion of their investigations. | *Learning activities:*  The module will be supported by regular lectures and supporting tutorials/seminars | *Assessment:*  Protfolio (100%) |
| 7007ELE  Semester 1  *Electronic and electrical engineering* | Digital Control  (10c) | *Aim:*  To extend concepts of digital control theory into system identification, controller design and self-tuning control techniques for single-input, single-output systems. | *Learning activities:*  Lectures supported by handouts & tutorials where appropriate.  Computer sessions will use software packages (MATLAB, SIMULINK and toolboxes).  Individual student reports are required for the coursework. | *Assessment:*  Examination (70%) PC based assignment (30%) |
| 7300SDM  Semester 1  *Electronic and electrical engineering* | INDUSTRIAL CONTEXT AND RELATIONSHIP  (20c) | *Aim:*  This module aims to provide the students with the current theories in industrial relationship and bring them into the context of working in different industries. | *Learning activities:*  Learning activities will include lectures and seminars from academics and industrial experts from different types of industries. Inverted classroom learning and activity based learning techniques will also be used. | *Assessment:*  PORTFOLIO OF WORK (100%) |
| 7301ELE  Semester 1  *Electronic and electrical engineering* | Professional Practice  (20c) | *Aim:*  To develop research skills and technical communication skills and awareness of the legal and ethical framework surrounding the activities of a professional engineer, including: personnel, health, safety, and risk (including environmental risk) issues. | *Learning activities:*  Lectures supported by handouts. Seminar sessions will review and discuss a variety of ethical case studies. An individual student report is required for each coursework. | *Assessment:*  Portfolio of work (100%) |
| 7301SDM  Semester 1  *Electronic and electrical engineering* | Advanced Programming  (20c) | *Aim:*  To develop the approach and skills necessary to design and implement engineering software  solution using high-level programming constructs. | *Learning activities:*  Learning activities will include lectures and practical laboratory sessions. | *Assessment:*  Implementation of a software s (50%) Hardware and software interfac (50%) |
| 7303ELEM  Semester 1  *Electronic and electrical engineering* | Dynamic Systems Simulation  (20c) | *Aim:*  To develop for students dynamic system simulation method and the techniques using Matlab/Simulink. | *Learning activities:*  By lectures, tutorials and practical example programming. | *Assessment:*  Assignment (50%) Assignment (50%) |
| 7304ELE  Semester 1  *Electronic and electrical engineering* | Microelectronic System Design  (20c) | *Aim:*  The module aims to gain knowledge and understanding of a range of advanced VLSI design and analysis methods and to develop the design and test techniques required for modern digital microelectronic systems. | *Learning activities:*  A combination of lectures and practical work. | *Assessment:*  Report (100%) |
| 7304ELEM  Semester 1  *Electronic and electrical engineering* | Microelectronic System Design  (20c) | *Aim:*  The module aims to gain knowledge and understanding of a range of advanced VLSI design and analysis methods and to develop the design and test techniques required for modern digital microelectronic systems. | *Learning activities:*  A combination of lectures and practical work. | *Assessment:*  Report (100%) |
| 7304SDM  Semester 1  *Electronic and electrical engineering* | Modelling and Simulation  (20c) | *Aim:*  This module is designed to introduce Matlab coding for scientific computation, and system simulation using Simulink.  The module will enable students with a background in using a traditional high-level programming language, but no experience using National Instruments (NI) LabVIEW, to create virtual Instruments (VI's) and interface them with compatible hardware for data acquisition (DAQ) and control applications. | *Learning activities:*  The module will be delivered through lectures, tutorials and practical lab sessions. Also,the teaching notes and exercise questions provided on Canvas will support the students' private study. | *Assessment:*  Demo and report (100%) |
| 7307ELE  Semester 1  *Electronic and electrical engineering* | Digital Control  (20c) | *Aim:*  To extend concepts of digital control theory into system identification, controller design and self-tuning control techniques for single-input, single-output systems. | *Learning activities:*  Lectures supported by handouts & tutorials where appropriate.  Computer sessions will use software packages (MATLAB, SIMULINK and toolboxes).  Individual student reports are required for the coursework. | *Assessment:*  Examination (70%) PC based assignment (30%) |
| 7307ELEM  Semester 1  *Electronic and electrical engineering* | Digital Control  (20c) | *Aim:*  To extend concepts of digital control theory into system identification, controller design and self-tuning control techniques for single-input, single-output systems. | *Learning activities:*  Lectures supported by handouts & tutorials where appropriate.  Computer sessions will use software packages (MATLAB, SIMULINK and toolboxes). | *Assessment:*  Examination (70%) PC based assignment (30%) |
| 7310ELEM  Semester 1  *Electronic and electrical engineering* | Digital Communications Systems  (20c) | *Aim:*  To develop knowledge and technical skills in the field of digital communications | *Learning activities:*  By a series of Lectures and Lab sessions | *Assessment:*  Exam (70%) Report (30%) |
| 7316ELEM  Semester 1  *Electronic and electrical engineering* | Advanced Signal Processing  (20c) | *Aim:*  This module aims to develop an advanced understanding of techniques and practical experience in industry-oriented applications of digital signal processing. | *Learning activities:*  Lectures and laboratory work supported by handouts.  Tutorials illustrating by numerical examples topics covered at lectures. | *Assessment:*  Examination (70%) Report (30%) |
| 7330ELEM  Semester 1  *Electronic and electrical engineering* | Research Skills  (10c) | *Aim:*  The aims of this module are to prepare the students to undertake their own research projects and to deliver the required skill set for successful completion of their investigations. | *Learning activities:*  The module will be delivered through a programme of lectures and supporting tutorials. | *Assessment:*  Portfolio of work (100%) |
| 7334ELEM  Semester 1  *Electronic and electrical engineering* | Modelling and Simulation  (10c) | *Aim:*  This module is designed to introduce Matlab coding for scientific computation, and system simulation using Simulink.  The module will enable students with a background in using a traditional high-level programming language, but no experience using National Instruments (NI) LabVIEW, to create virtual Instruments (VI's) and interface them with compatible hardware for data acquisition (DAQ) and control applications. | *Learning activities:*  The module is designed for student self-learning with the teaching notes and exercise questions provided on Blackboard. | *Assessment:*  Matlab, Simulink, LABVIEW (100%) |
| 7342ELEM  Semester 1  *Electronic and electrical engineering* | IC System Design  (20c) | *Aim:*  The module aims to gain knowledge and understanding of a range of advanced VLSI design and analysis methods and to develop the design and test techniques required for modern digital microelectronic systems. | *Learning activities:*  A combination of lectures and practical work. | *Assessment:*  Report (100%) |
| 4107MECH  Semester 2  *Electronic and electrical engineering* | Electrical and Electronic Engineering  (20c) | *Aim:*  To enable students to develop an understanding of the physical principles of electrical and electronic systems, and to analyse simple circuits which incorporate passive and active components. | *Learning activities:*  Lectures and tutorials | *Assessment:*  Examination (60%) V.L.E. based test (40%) |
| 4175CSD  Semester 2  *Electronic and electrical engineering* | The Digital Platform & Cyberspace Technology  (20c) | *Aim:*  The digital platform describes and defines the landscape within which much of the social media and lifestyle management environment exists. This module will explore that landscape and how apps and devices communicate and manage information and data in cyberspace. | *Learning activities:*  A series of structured lectures, tutorials and practical tasks will provide a varied range of learning activities. | *Assessment:*  Report (70%) Lab (30%) |
| 4176CSD  Semester 2  *Electronic and electrical engineering* | Designing Software Apps  (20c) | *Aim:*  This module aims to provide a thorough understanding of the principles of programme design.  This module goes on to introduce the fundamental principles of how to design apps that are functional, effective and attractive. Mobile devices and smartphones have become the de facto vehicle for apps. The module will also explore the design of apps within the Android environment. The module will develop students' practical programming capability to build mobile based applications and generate effective user and technical documentation. | *Learning activities:*  A series of structured lectures and practical tasks will provide a varied range of learning activities. | *Assessment:*  Report (70%) Lab (30%) |
| 4203AMP  Semester 2  *Electronic and electrical engineering* | Audio Production Technology  (20c) | *Aim:*  To provide a solid understanding of the concepts upon which audio production is achieved | *Learning activities:*  Lectures supporting the practical sessions. There are also demonstrations of the practical work. Student work groups are also included in the activities. | *Assessment:*  Technical specification (50%) Build and test (50%) |
| 4205AMP  Semester 2  *Electronic and electrical engineering* | Sound Technology  (20c) | *Aim:*  To introduce the principles of sound systems and sound waves, which can be applied to a wide range of acoustics and audio subjects. | *Learning activities:*  Attend all lectures, tutorial and practical sessions.  Engage with on-line learning materials via Blackboard.  Research and produce the output for the practical assignment | *Assessment:*  Room & equipment calculations (70%) Acoustics (30%) |
| 4206AMP  Semester 2  *Electronic and electrical engineering* | Radio and Podcasting  (20c) | *Aim:*  Maintain and extend a sound theoretical approach to the application of radio production and its technology in practice. Use a sound methodological approach to audio editing. Identify, review and select techniques, procedures and methods to undertake editing tasks. Plan for effective project implementation and deployment of edited work via radio outlet | *Learning activities:*  Practical sessions and demonstrations including student work groups | *Assessment:*  Written Pitches for delivery (30%) Production of Documentary/Show (70%) |
| 4209AMP  Semester 2  *Electronic and electrical engineering* | Introduction to Post Production  (20c) | *Aim:*  Maintain and extend a sound theoretical approach to the application of technology in  audio video post-production practice. Use a sound methodological approach to video editing.  Identify, review and select techniques, procedures and methods to undertake editing  tasks. Plan for effective project implementation of edited work. | *Learning activities:*  Practical sessions and demonstrations including student work groups | *Assessment:*  Portfolio (100%) |
| 4302ELE  Semester 2  *Electronic and electrical engineering* | Microprocessors and Software  (20c) | *Aim:*  Provide an overview of the operation of modern microprocessors/microcontrollers and the mechanisms used to represent and process information. Design and implement applications written in both low level and high level languages. | *Learning activities:*  Lecture, demonstration and practical activities applying topics discussed. | *Assessment:*  Exam (60%) Programming (40%) |
| 4304ELE  Semester 2  *Electronic and electrical engineering* | Digital and Analogue Electronics  (20c) | *Aim:*  To provide an introduction to transistors and the small-signal equivalent circuits, the use of operational amplifiers and the operation of combinational and sequential digital logic circuits. | *Learning activities:*  A combination of lectures and practical work. | *Assessment:*  Exam (60%) Portfolio (40%) |
| 4316ELE  Semester 2  *Electronic and electrical engineering* | Engineering Mathematics 1b  (20c) | *Aim:*  To provide a foundation in engineering mathematics for its application to the solution of engineering problems | *Learning activities:*  A combination of lectures and tutorials. | *Assessment:*  Online Assessment (100%) |
| 5109MECH  Semester 2  *Electronic and electrical engineering* | Marine Electrical Systems  (20c) | *Aim:*  The aim of this module is to provide a comprehensive introduction to Marine Instrumentation and Electrical Engineering, the module will concentrate on the principles, construction and operation of marine instrumentation, ac and dc motors and generators, and associated distribution and protection systems. | *Learning activities:*  A series of lectures and tutorials. | *Assessment:*  Examination (60%) VLE Test (40%) |
| 5174CSD  Semester 2  *Electronic and electrical engineering* | AI & Machine Learning  (20c) | *Aim:*  Artificial intelligence as a concept has been around for many years but more recently has become a very prominent and socially acceptable technology. From self-driving vehicles, healthcare and medical diagnosis, through to robot manufacture, intelligent machines and Amazon Echo, Apple Homepod or Google Home. AI and machine learning is the technology of the moment and this module will explore the underlying technology and how it is changing our lives. | *Learning activities:*  A series of structured lectures, tutorials and practical tasks will provide a varied range of learning activities. | *Assessment:*  Report (50%) Report (50%) |
| 5175CSD  Semester 2  *Electronic and electrical engineering* | Internet of Things  (20c) | *Aim:*  Modern smart devices rely on the use of cloud technology for data storage and security and app availability that is automatically updated without any intervention on our part. Couple the cloud to everyday objects at the office or around the home results in an enormously powerful environment that can be controlled and efficiently managed whenever and wherever required. This module aims to provide us with the knowledge and skills to take the best benefits from such technology. | *Learning activities:*  A series of structured lectures and practical tasks will provide a varied range of learning activities. | *Assessment:*  Report (70%) Lab (30%) |
| 5176CSD  Semester 2  *Electronic and electrical engineering* | Smart Device Project  (20c) | *Aim:*  To enable students to develop the skills required to practice as a professional engineer. This module provides a broad range of experiences with an emphasis upon the systematic thinking, planning and execution required of engineers in a modern professional environment. The students will be required to design build and test an electronic product to a given specification. | *Learning activities:*  Students will be split into two groups and undertake a supervised laboratory session every fortnight. Lectures and tutorials will take place in the weeks between lab sessions. | *Assessment:*  Project Development (60%) Lit Review/project plan (40%) |
| 5203AMP  Semester 2  *Electronic and electrical engineering* | Live Performance Operations  (20c) | *Aim:*  To consolidate and extend knowledge of technical operations in the broadcast media  and creative industries, with specific regard to the additional challenges encountered in technical management of live performances. | *Learning activities:*  Attend all lectures, tutorial and practical sessions.  Engage with on-line learning materials via Blackboard.  Research and produce the output for the practical assignment | *Assessment:*  Stage Set-up (80%) Reflective report (20%) |
| 5204AMP  Semester 2  *Electronic and electrical engineering* | Broadcast Studio Operations  (20c) | *Aim:*  To introduce students to professional technical practices and equipment as used in broadcast media and creative industries, including: managing and organising tasks, people and resources; working to specifications; and applying safe systems of work | *Learning activities:*  Attend all lectures and practical sessions.  Engage with on-line learning materials via Blackboard.  Research and produce the output for the practical assignment | *Assessment:*  Production - Studio Radio Prog (50%) Production - Studio TV Prog (50%) |
| 5205AMP  Semester 2  *Electronic and electrical engineering* | Sound for TV, Film and Games  (20c) | *Aim:*  To introduce students to audio equipment used in TV & Film recording, and the practical issues arising from location and studio recording. To gain experience of both hardware and software audio devices deployed in digital audio recording for TV, Film and gaming industries | *Learning activities:*  Practical sessions and demonstrations including student work groups | *Assessment:*  Foley, ADR and music tracks (50%) Audio soundtracks (50%) |
| 5302ELE  Semester 2  *Electronic and electrical engineering* | Electric Machines  (20c) | *Aim:*  This module is intended to achieve the following programme aims within the field of Electrical Engineering:  To enhance knowledge and understanding of the broad scientific and technological principles underpinning operation of electrical machinery.  To rehearse practical skills in the use of mathematical methods for modelling and analysing problems related to rotating electrical machines and transformers. The use of relevant test and measurement equipment by undertaking experimental laboratory work.  In particular to enhance the knowledge of electromagnetism and electromechanical energy conversion | *Learning activities:*  A series of lectures tutorials and practical lab sessions | *Assessment:*  Exam (60%) Practical and thoery (40%) |
| 5304ELE  Semester 2  *Electronic and electrical engineering* | Linear Electronics  (10c) | *Aim:*  The module aims to broaden the students' knowledge and understanding of linear electronic circuit design, and also to provide students with practical skills necessary to design, analyse and simulate and manufacture electronic circuits. | *Learning activities:*  A combination of lectures, and practical work. | *Assessment:*  Exam (70%) Report (30%) |
| 5306ELE  Semester 2  *Electronic and electrical engineering* | Electrical Engineering Practice 2  (20c) | *Aim:*  To enable students to develop the skills required to practice as a professional engineer. This module provides a broad range of experiences with an emphasis upon the systematic thinking, planning and execution required of engineers in a modern professional environment. The students will be required to design build and test an electronic product to a given specification. The product will incorporate elements covered elsewhere on the course, including analogue electronics and a programmable device such as a microcontroller or FPGA. | *Learning activities:*  Students will be split into two groups and undertake a supervised laboratory sessions every fortnight, lectures and tutorials will take place in the weeks between lab sessions. | *Assessment:*  Project Development (60%) Lit Review/project plan (40%) |
| 6204AMP  Semester 2  *Electronic and electrical engineering* | Audio Restoration and Digital Enhancement  (20c) | *Aim:*  To enable students to apply modern digital techniques for the analysis reconstruction / transfer / identification and enhancement of a variety of audio signals and artefacts. | *Learning activities:*  Lectures, Practical sessions and demonstrations including student work groups | *Assessment:*  Report on methodologies (30%) enhance & isolation techniques (70%) |
| 6205AMP  Semester 2  *Electronic and electrical engineering* | Project  (40c) | *Aim:*  To allow the students to develop their knowledge, skills, and general expertise in relation to a project deliverable embodying technical mastery, good design practice, and self-management on a subject of their choice. The project will provide the opportunity for the students to demonstrate their ability to learn and develop their skills independently culminating in an appropriate media-related deliverable suitable for showcasing to prospective employers. | *Learning activities:*  Project work; lectures on project support topics; supervision tutorials | *Assessment:*  Log and time management (20%) Presentation and viva (20%) Final written report (30%) Media related deliverable (30%) |
| 6207AMP  Semester 2  *Electronic and electrical engineering* | Media Delivery and Monetization  (20c) | *Aim:*  How media is consumed Has changed enormously since the advent of computers and on-line media. The primary focus of this module is how to effectively implement marketing strategies using databases and the Internet that allow television companies to interact with viewers on an individual basis, enhancing audience loyalty and profitability.  The module also introduces aspects of playout systems, including their selection, configuration and use. | *Learning activities:*  The module will be delivered via lectures supported by tutorial activity and lab work. Videos, guest speakers will be used where appropriate. Additional reading will be prescribed to develop depth of knowledge and understanding of selected topics. | *Assessment:*  Project (50%) Streaming Demonstration (50%) |
| 6305ELE  Semester 2  *Electronic and electrical engineering* | Power Electronics, Drives and Systems  (20c) | *Aim:*  To develop intellectual ability to select and apply appropriate mathematical methods for modelling and analysing problems and produce solutions to problems through the practical application of electrical power engineering. | *Learning activities:*  A series of lectures, tutorials and lab sessions | *Assessment:*  Final exam (80%) Lab report (20%) |
| 7001AMP  Semester 2  *Electronic and electrical engineering* | Audio Restoration Theory and Practice  (30c) | *Aim:*  To provide students with a comprehensive understanding of the theory, processes and techniques in the field of Audio Restoration  To equip the student with knowledge and understanding to critically analyse, select and apply appropriate techniques to transcode, restore, deliver and report upon the methodologies engaged in the recovery of audio media | *Learning activities:*  Lectures, Practical sessions and demonstrations including measurement and calculation procedures | *Assessment:*  Test (25%) Remastering (50%) Optimisation (25%) |
| 7002AMP  Semester 2  *Electronic and electrical engineering* | The Commercial and Legal Environment  (20c) | *Aim:*  This module complements the technical and practical competencies of the other modules by creating an awareness of the current commercial, legal and regulatory environment of the industry and the agencies which comprise it. It is a vehicle for the exploration, debate and formulation of relevant principles and practice. Additionally it provides space for self-assessment and identification of career opportunities with established organisations and/or freelance work. | *Learning activities:*  Lectures, guest speaker, research-based tutorials. | *Assessment:*  Report (70%) Personal SWOT (30%) |
| 7003AMP  Semester 2  *Electronic and electrical engineering* | Legacy Media Formats  (10c) | *Aim:*  The module will explore various methods of storing and reproducing representations of media in a variety of legacy formats. | *Learning activities:*  Lectures, tutorials, investigations , Practical sessions and demonstrations. | *Assessment:*  Report (100%) |
| 7009ELE  Semester 2  *Electronic and electrical engineering* | Embedded Systems  (20c) | *Aim:*  To provide both the theoretical and practical skills in the design and development of advanced embedded systems.. | *Learning activities:*  Lectures, Tutorials, Practical activities | *Assessment:*  Laboratory demo and report (30%) Examination (70%) |
| 7300ELE  Semester 2  *Electronic and electrical engineering* | Modelling and Control of Electric Machines and Drives  (20c) | *Aim:*  To develop an understanding of principles and acquire working knowledge of mathematical modelling of electrical machines.  To introduce the principles of control of variable speed electric drives using power electronic converters.  To introduce the concept of vector control as applied to induction machines. | *Learning activities:*  Lectures supported by handouts. Practical sessions will use software packages for development of the simulation software. An individual student report is required for each of the two courseworks. | *Assessment:*  Simulation of induct machines (50%) Simulation of AC mach dynamics (50%) |
| 7300ELEM  Semester 2  *Electronic and electrical engineering* | Modelling and Control of Electric Machines and Drives  (20c) | *Aim:*  To develop an understanding of principles and acquire working knowledge of mathematical modelling of electrical machines.  To introduce the principles of control of variable speed electric drives using power electronic converters.  To introduce the concept of vector control as applied to induction machines. | *Learning activities:*  Lectures supported by handouts. Software packages will be used for the development and simulation of electrical machines. An individual student report is required for each of the two courseworks. | *Assessment:*  Simulation of induct machines (50%) Simulation of AC mach dynamics (50%) |
| 7302ELE  Semester 2  *Electronic and electrical engineering* | Control Systems  (20c) | *Aim:*  This module aims to let students learn state space control method for dynamic system modelling, control, analysis and simulation. | *Learning activities:*  Lectures supported by handouts.  Tutorials supported by handouts.  An individual student report is required for the coursework. | *Assessment:*  Exam (70%) System design Matlab/Simulink (30%) |
| 7302ELEM  Semester 2  *Electronic and electrical engineering* | Control Systems  (20c) | *Aim:*  This module aims to let students learn state space control method for dynamic system modelling, control and analysis. | *Learning activities:*  Lectures supported by handouts.  Tutorials supported by handouts and using appropriate software.  An individual student report is required for the coursework. | *Assessment:*  Exam (70%) System design Matlab/Simulink (30%) |
| 7303SDM  Semester 2  *Electronic and electrical engineering* | Sensor Networks and Data Analytics  (20c) | *Aim:*  To develop an understanding of concepts around sensors, networking sensors, and techniques for Big Data analysis. | *Learning activities:*  Module delivery will include lectures, tutorials and practical laboratory sessions. | *Assessment:*  Practical demo and report (50%) Examination (50%) |
| 7305ELEM  Semester 2  *Electronic and electrical engineering* | VLSI Devices, Fabrication and Testing  (20c) | *Aim:*  To develop an understanding of the state-of-the-art CMOS devices and systems.  To gain knowledge in the fabrication and testing of microelectronic devices.  To enhance knowledge in latest consumer electronic products. | *Learning activities:*  Lectures supported by handouts & tutorials where appropriate.  An individual student report is required for the coursework. | *Assessment:*  Exam (70%) Report (30%) |
| 7308ELEM  Semester 2  *Electronic and electrical engineering* | Power Systems Modelling and Analysis  (10c) | *Aim:*  To develop an understanding of the power system component modelling for steady-state analysis and the types of problems encountered inpower system analysis.  To conisder the principles of voltage and reactive power control in power systems. | *Learning activities:*  Lectures supported by handouts.  Tutorials illustrating by numerical examples topics covered at lectures. | *Assessment:*  Examination (100%) |
| 7313ELEM  Semester 2  *Electronic and electrical engineering* | VLSI Design  (10c) | *Aim:*  To develop skills related to VLSI design.  To develop advanced skills in VLSI circuit design, at the transistor and gate levels.  To develop expertise in modern digital electronic circuit design and testing. | *Learning activities:*  Lectures supported by handouts & tutorials where appropriate.  Practical sessions will use software packages (eg Chipwise, Xilinx) for circuit design and development. | *Assessment:*  Examination (100%) |
| 7314ELEM  Semester 2  *Electronic and electrical engineering* | Wireless Networks and Data Analytics  (20c) | *Aim:*  To develop an understanding of ad hoc and sensor networking concepts, protocol design, and coding techniques. | *Learning activities:*  Lectures, Tutorials, Practical activities | *Assessment:*  Exam (70%) Assignment (30%) |
| 7317ELEM  Semester 2  *Electronic and electrical engineering* | Transmission Media  (20c) | *Aim:*  To introduce the use of the electromagnetic spectrum in telecommunications systems, the choices available and consequences for system design | *Learning activities:*  Lectures and tutorials based on case studies and practicals | *Assessment:*  Case study report (100%) |
| 7318ELEM  Semester 2  *Electronic and electrical engineering* | Networks and Protocols  (20c) | *Aim:*  To develop an extensive knowledge of network architectures and the protocols which are used therein. | *Learning activities:*  By a series of lectures, labs, tutorials and assignments. | *Assessment:*  Report (30%) Exam (70%) |
| 7341ELEM  Semester 2  *Electronic and electrical engineering* | Professional and Leadership Skills  (10c) | *Aim:*  To develop awareness of the legal and ethical framework surrounding the activities of a professional engineer, including: personnel, health, safety, and risk (including environmental risk) issues; To develop awareness of the Emotional Competence Framework for a professional engineer; To develop specific set of personal and social competency skills appropriate for a professional engineer, including adaptability, creativity and innovation, creativity diversification, leveraging diversity, political awareness, communication, conflict management, leadership, collaboration and cooperation, team capabilities. | *Learning activities:*  This module will be delivered through a combination of formal lectures, seminars, and practical group activities. | *Assessment:*  Social & personal competencies (100%) |
| 7343ELEM  Semester 2  *Electronic and electrical engineering* | Nano Devices, Fabrication and Testing  (20c) | *Aim:*  To develop an understanding of the state-of-the-art CMOS devices and systems.  To gain knowledge in the fabrication and testing of microelectronic devices.  To enhance knowledge in latest consumer electronic products. | *Learning activities:*  Lectures supported by handouts & tutorials where appropriate.  An individual student report is required for the coursework. | *Assessment:*  Exam (70%) Report (30%) |
| 7344ELEM  Semester 2  *Electronic and electrical engineering* | Digital Design & Test  (10c) | *Aim:*  To develop skills related to digital design.  To develop advanced skills in digital circuit design, at the transistor and gate levels.  To develop expertise in modern digital electronic circuit design and testing. | *Learning activities:*  Lectures supported by handouts & tutorials where appropriate.  Practical sessions will use software packages (eg Chipwise, Xilinx) for circuit design and development. | *Assessment:*  Examination (100%) |
| 7345ELEM  Semester 2  *Electronic and electrical engineering* | Sensors and Data Analytics  (20c) | *Aim:*  To develop an understanding of ad hoc and sensor networking concepts, protocol design, and coding techniques. | *Learning activities:*  Lectures, Tutorials, Practical activities | *Assessment:*  Exam (70%) Assignment (30%) |
| 7346ELEM  Semester 2  *Electronic and electrical engineering* | Radio & Optical Signal Propagation  (20c) | *Aim:*  To introduce the use of the electromagnetic spectrum in telecommunications systems, the choices available and consequences for system design | *Learning activities:*  Lectures and tutorials based on case studies and practicals | *Assessment:*  Case study report (100%) |
| 7347ELEM  Semester 2  *Electronic and electrical engineering* | Wireless Networks  (20c) | *Aim:*  To develop an extensive knowledge of network architectures and the protocols which are used therein. | *Learning activities:*  By a series of lectures, labs, tutorials and assignments. | *Assessment:*  Exam (70%) Report (30%) |
| 4305ELE  Yearlong  *Electronic and electrical engineering* | Electrical Engineering Practice 1  (20c) | *Aim:*  To enhance knowledge and understanding of electrical and electronic circuits by completing a set of practical experiments. To gain experience in practical design of electronic circuits including prototyping and PCB design and manufacture. To develop professional practical skills to undertake experimental laboratory work, to test design ideas in laboratories or through simulation, to analyse and critically evaluate technical issues, and to present and document ideas and results. To develop the ability in data manipulation and sorting. To develop a personal development plan and understand the impact engineering has on the environment. | *Learning activities:*  Laboratory experiments, tutorials, and residential field trip. | *Assessment:*  Fieldwork and Lab Activities (50%) Personal Development (10%) Prototype Product (40%) |
| 5001ELE  Yearlong  *Electronic and electrical engineering* | Digital and Embedded Systems  (20c) | *Aim:*  The module aims to broaden the students' knowledge and understanding of digital circuit design, and examines modern microcontroller architectures and the interface requirements to external systems. It also aims to provide students with practical skills necessary to design, analyse and implement electronic circuits controlled by  microcontrollers and finite state machines | *Learning activities:*  Lecture, demonstration and practical activities applying topics discussed. | *Assessment:*  Exam (70%) Digital Systems Assignment (15%) Embedded Systems Assignment (15%) |
| 5002ELE  Yearlong  *Electronic and electrical engineering* | Electric Power Engineering  (20c) | *Aim:*  This module is intended to achieve the following programme aims within the field of Electrical Engineering  To introduce three-phase circuits and to further develop circuit analysis skills relating to ac circuits.  To introduce the three-phase power system and transmission lines.  To enhance knowledge and understanding of the broad scientific and technological principles underpinning operation of rotating electrical machinery and transformers.  To develop understanding of the steady-state operating principles of single-phase, three-phase transformers, DC and AC machines rotating machines.  To rehearse practical skills in the use of mathematical methods for modelling and analysing problems, and the use of relevant test and measurement equipment by undertaking experimental laboratory work. | *Learning activities:*  A series of lectures tutorials and practical lab sessions | *Assessment:*  Exam (50%) Practical lab report (30%) In-class test (20%) |
| 5004ELE  Yearlong  *Electronic and electrical engineering* | Linear Electronics  (10c) | *Aim:*  The module aims to broaden the students' knowledge and understanding of linear electronic circuit design, and also to provide students with practical skills necessary to design, analyse and simulate and manufacture electronic circuits. | *Learning activities:*  A combination of lectures, and practical work. | *Assessment:*  Exam (70%) Report (30%) |
| 5005ELE  Yearlong  *Electronic and electrical engineering* | Control System Design and Analysis  (20c) | *Aim:*  To develop an understanding of components and the principles of control systems, basic design and analysis techniques, and practice some control applications to industrial systems. | *Learning activities:*  By a series of lectures, tutorials and computer simulations. | *Assessment:*  Exam (70%) Report (30%) |
| 5006ELE  Yearlong  *Electronic and electrical engineering* | Electrical Engineering Practice 2  (20c) | *Aim:*  To enable students to develop the skills required to practice as a professional engineer. This module provides a broad range of experiences with an emphasis upon the systematic thinking, planning and execution required of engineers in a modern professional environment. The students will be required to design build and test an electronic product to a given specification. The product will incorporate elements covered elsewhere on the course, including analogue electronics and a programmable device such as a microcontroller or FPGA. | *Learning activities:*  Students will be split into two groups and undertake a supervised laboratory sessions every fortnight, lectures and tutorials will take place in the weeks between lab sessions. | *Assessment:*  Group Presentation (50%) Professional Development (10%) Individual Literature Review (20%) Individual Project Plan (20%) |
| 5012ELE  Yearlong  *Electronic and electrical engineering* | Applied Instrumentation  (20c) | *Aim:*  To introduce the students to a graphical based programming language that enables  the user to program via a CAD style environment enabling them to create virtual  instruments as a base for data acquisition and instrument control. | *Learning activities:*  By a series of seminars and practical sessions. Students will be encouraged to work  independently. | *Assessment:*  Design Assignment 1 (25%) Design Assignment 2 (25%) Mini Project (50%) |
| 6355ELE  Yearlong  *Electronic and electrical engineering* | Engineering Project  (30c) | *Aim:*  The project aims to provide a supervised but student led learning activity in a relevant area of engineering or technology. It aims to develop the academic, technical and organisational skills required to undertake a substantial individual engineering project from specification to conclusion. | *Learning activities:*  The project will be supported by regular tutorials with a project supervisor and occasional seminars on topics relating to research methods, critical writing/thinking and presentation skills. | *Assessment:*  Interim Report (20%) Final Report (50%) Presentation, Viva and Poster (30%) |