Subject Description

Subject Title : Mathematics II (Compulsory)
Subject Code : AMA202
Level of Study : 2
Hours Assigned :
   Lecture    28 hours
   Tutorial    14 hours
Pre-requisites : Mathematics I (AMA201)
Credits : 3

Objectives :

To introduce the degree students to the fundamentals of engineering mathematics. The emphasis will be on the application of mathematical methods to solving engineering problems.

Keyword Syllabus :

Complex variables: Elementary functions, continuity, complex derivatives and Cauchy-Riemann relations, analytic functions, contour integrations, Cauchy's integral theorem and formula, singularities and residues.


Statistics: Probability and random variables, probability distributions, sampling distributions of means, estimation and hypothesis testing, linear regression.

Textbooks :


Method of Assessment :

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<th>Component</th>
<th>Percentage</th>
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<tr>
<td>Continuous Assessment</td>
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<td>Examination</td>
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Note : To pass this subject, students are required to obtain Grade D or above in both the Continuous Assessment and the Examination components.
### Subject Description

**Subject Title**: Elementary Putonghua (Compulsory)  
**Subject Code**: CLC211  
**Level of Study**: 2  
**Hours Assigned**: Seminar 42 hours  
**Pre-requisite**: Nil  
**Credits**: 3

**Objectives**: Students are expected to:

(i) have relevant knowledge in spoken Modern Standard Chinese;  
(ii) be sensitive to major differences between Cantonese and Putonghua;  
(iii) be familiar with the Pinyin system of Mandarin phoneticization;  
(iv) be capable of understanding and expressing themselves in Putonghua for essential daily communication purposes.

**Aims**: This subject aims to acquaint students with basic communication skills in Putonghua.

**Textbook**:  
1. 香港理工大學中文及雙語學系“通用普通話教程”編寫組編《通用普通話教程》第一、二冊, 香港: 星河教育出版社, 1997。

**Reference**:  
1. 中國社會科學院語言研究所詞典編輯室編《現代漢語詞典》（修訂本），北京: 商務印書館, 1996。

**Method of Assessment**:  
- Coursework: 60%  
- Term-end Test: 40%  
- Total: 100%

**Attendance**: If attendance of the subject falls below 70%, only 80% of the total mark would be counted towards the final grade.
Subject Description

Subject Title : Society and the Engineer (Compulsory)
Subject Code : EIE200
Level of Study : 2
Hours Assigned : Lecture/Seminar 14 hours  Tutorial/Student Presentation 28 hours
Pre-requisites : Nil
Credits : 3

Objectives :

To enable the students to

(i) appreciate the responsibility and accountability of a profession in engineering;
(ii) know the organizational activities of professional engineering institutions;
(iii) appreciate the historical context of modern technology and acquire an understanding of the nature of the process whereby technology develops;
(iv) know the principal features of the process of product invention, development, marketing and improvement (and eventual obsolescence), i.e. product life-cycle;
(v) know the “code of conduct” for engineers and acquire the concepts of legal and moral constraints relating to various aspects in engineering;
(vi) become aware of the short-term and long-term effects of the use of technology on safety, health and welfare aspects;
(vii) appreciate the social, political, economic and commercial framework within which engineers have to work and become an informed participant in civic matters.

Philosophy :

The aim of this subject is to develop, in the students, an ability and willingness to use their intellectual faculties in an objective, systematic way when considering social matters of engineering relevance which are not amenable to analytic solutions.

Keyword Syllabus :

Local and overseas education systems; professional activities; professional institutions for electronic and information engineers; research and development; technology transfer; quality assurance; product life-cycle; technology trends towards the 21st century; innovation and creativity; technology and economics; engineering ethics; code of conduct; copyright and patents; environment issues; safety, health and welfare; effects of government policies on the electronic industries.
References and Sources of Materials:

2. “IEEE Spectrum”, a monthly publication of the Institute of Electrical and Electronics Engineers Inc.
6. *Hong Kong – A Review of 2001*, Information Service Department, HKSAR.

Method of Assessment:

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Note: To pass this subject, students must obtain grade D or above in BOTH the coursework and the examination.
Subject Description

Subject Title : English for Academic Purposes (Compulsory)
Subject Code : ELC205
Level of Study : 2
Hours Assigned : Seminars 42 hours
Pre-requisites : Nil
Credits : 3

Objectives :
In general, to help students study effectively in the University’s English medium learning environment.

More specifically, to help students to improve and develop their English language proficiency within a framework of academic contexts.

In working towards the achievement of the two interrelated objectives, attention will be given to helping students develop the core competencies identified by the University as vital to the development of effective life-long learning strategies and skills.

Subject Description :

The subject is designed to enable students to use English effectively in the academic contexts they will encounter in their studies. The main emphasis is on improving students’ confidence and competence in using English in these contexts. As far as possible, the subject will address the specific language needs of students’ ability levels and subject specialisms.

The study method is primarily based on seminars and these will include interactive learning techniques such as discussions and role-plays. Use will also be made of video and tape recordings, relevant Web-based materials/activities and our Centre for Independent Language Learning. Students in need of additional help will be required to attend a supplementary English programme organised by the English Language Centre.

Teaching and Learning Materials :

Material specially prepared by English Language Centre staff will be used throughout the course. In addition, teachers will recommend additional reference materials as required.

Keyword Syllabus :

This syllabus is indicative. The balance of the components, and the weighting accorded to each will be based on the specific needs of the students.

To work towards the accomplishment of its objectives, the syllabus is specified under a single heading consisting of four interrelated strands.

English language development in academic contexts

1. **Spoken academic communication**: recognising the purposes of and differences between spoken and written communication in English in academic contexts; identifying and practising interactional and linguistic aspects of participation in seminar discussions; discussing issues requiring the development and application of creative and critical thinking; preparing and delivering oral presentations.
2. **Written academic communication**: identifying and writing functions common in written academic discourse; note-taking from reading and listening inputs; understanding and applying principles of academic text structure; developing paraphrasing, summarising and referencing skills; improving editing and proofreading skills; achieving appropriate tone and style in academic writing.

3. **Reading and listening in academic contexts**: understanding the content and structure of information delivered both orally and in print form; reading and listening for different purposes e.g. as input to tasks, and for developing specific reading or listening skills; using a dictionary to obtain lexical, phonological and orthographical information.

4. **Language development**: improving and extending relevant features of students’ grammar, vocabulary and pronunciation.

**References**:

1. **Spoken Academic Communication**

2. **Written Academic Communication**

3. **Reading and Listening in Academic Contexts**

4. **Language Development**

**Method of Assessment**:

| Coursework | 100% |
Subject Description

Subject Title : Computational Methods (Compulsory)
Subject Code : AMA301
Level of Study : 3
Hours Assigned : Lecture 28 hours
                 Tutorial 14 hours
Pre-requisites : Mathematics I (AMA201)
Credits : 3

Objectives :
The objective of this subject is to provide the student with a firm foundation in mathematical methods for finding numerical approximations to practical problems. Computer implementation of algorithms by students is emphasized.

Keyword Syllabus :
Error propagation; linear systems, direct methods and iterative methods; finite difference and interpolation, Lagrange interpolating polynomial, Aitken's interpolating formula; least-squares regression; numerical differentiation and integration, composite rules, Gauss quadrature; roots of nonlinear equation, two-point methods, fixed point iterations; numerical solution of ordinary differential equation, Predictor-corrector method, Runge-Kutta method; unconstrained nonlinear optimization, one-dimensional and multi-dimensional search methods, gradient method.

Computer software, such as Matlab, will be used to solve practical engineering problems. Analysis of errors in the numerical algorithms rather than the derivation of techniques will be emphasized.

Textbooks :

Method of Assessment :
Continuous Assessment 45%
Examination 55%
Total 100%

Note : To pass this subject, students are required to obtain Grade D or above in both the Continuous Assessment and the Examination components.
Subject Description

Subject Title: Economics for Engineers (Compulsory)

Subject Code: AF3901

Level of Study: 3

Hours Assigned:
- Lectures: 28 hours
- Tutorials: 14 hours

Pre-requisites: Nil

Exclusion: Economics for Engineers (AF2617)

Credits: 3

Objectives:

To enable students to understand the fundamental concepts of economics/finance/costing and apply them to explain the functioning of an engineering company and decision making in engineering operations.

Keyword Syllabus:

Basic Principles of Economics; Price Mechanism; Theory of Demand; Behaviour of the Firm; Organisation of Industry.

Economic model of an engineering company; Composition of costs; Costing systems; Activity and time based costing; Profit and loss control. Investment and sources of finance; Return on investment. Budgetary planning and control.

Textbooks:

Method of Assessment:

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Minimum Component Pass Grade:

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</table>
Subject Title: Advanced Engineering Mathematics (Compulsory)

Subject Code: EIE300

Level of Study: 3

Hours Assigned: Lecture/Tutorials 42 hours

Pre-requisites: Mathematics II (AMA202)

Credits: 3

Objectives:

The syllabus aims to introduce

(i) Vector calculus;
(ii) Special functions and function-space;
(iii) Stochastic processes and random signals.

At the completion of the subject, the student is introduced to advanced mathematical techniques which are useful in further areas of Electronics and Information Engineering.

Keyword Syllabus:

(i) Vector calculus: multiple integrals, vector differential calculus, and line and surface integrals.
(ii) Special functions: Poisson and Laplace equation, boundary value problems, orthogonal functions and expansion; Laplace equations in rectangle coordinate and spherical coordinates; Legendre polynomials. Bessel Equation and Bessel function.
(iii) Probability models and axioms; random variables; transformation of random variables; stochastic process; spectral analysis; Markov chains; Central limit theorem.
(iv) Dynamical systems: linear and nonlinear systems; phase space dynamics; fixed points, limit cycles, and attractors.

References:


Method of Assessment:

Coursework: 40%
Examination: 60%
Total: 100%

Note: To pass this subject, students must obtain grade D or above in BOTH the coursework and the examination.
Subject Description

Subject Title : Electronic Circuits (Elective)
Subject Code : EIE304
Level of Study : 3
Hours Assigned : Lecture/Tutorial 33 hours
                 Laboratory 9 hours
Pre-requisites : Basic Electronics (ENG234)
Credits : 3

Objectives :

This is the main foundation subject introducing the working principles and constructions of analog electronic circuits. The specific aim is to familiarize students with the design and operation of

(i) Analog building blocks, e.g., mirrors, differential stages, output stages.
(ii) Practical operational amplifiers;
(iii) Feedback amplifiers and oscillators.

Keyword Syllabus :

Current mirrors, early effect and output resistance; differential input stages and output stages. Operational amplifier design; slew rate limitation; internal compensation; feedback op-amp circuits. High-frequency parasitics and Miller effect; hybrid-pi models and high-frequency responses of transistor amplifiers. Feedback and stability; feedback configurations; gain and phase margins; oscillators design.

Textbook :


References :


Method of Assessment :

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Note : To pass this subject, students must obtain grade D or above in BOTH the coursework and the examination.
Subject Description

Subject Title : Computer System Fundamentals (Compulsory)
Subject Code : EIE311
Level of Study : 3
Hours Assigned : Lecture/Tutorial 33 hours
                 Laboratory 9 hours
Pre-requisites : Logic Design (EIE211)
Credits : 3

Objectives :

This module provides an introduction to the fundamental knowledge of

(i) the organisation and structure of a small computer system;
(ii) the important features of an operating system and basic system utilities;
(iii) the component parts of a digital computer and their inter-relationships; and
(iv) the microprocessor as a digital computing and/or controlling device.

Keyword Syllabus :

Computer system configuration: supporting elements; computer arithmetic;
microprogramming technique; memory organization; serial and parallel interfacing
techniques; interrupt and DMA. Single-user disks operating system: functions and structures;
start-up sequence; files and directory; command interpreter; device driver; software interrupts
and OS calls; system utilities; file manipulation.

Textbook :

1. Barry B. Brey, *The Intel Microprocessors 8086/8088, 80186/80188, 80286, 80386, 80486,

References :


Method of Assessment :

| Coursework | 40% |
| Examination | 60% |
| **Total** | **100%** |

Note : To pass this subject, students must obtain grade D or above in BOTH the coursework and the examination.
### Subject Description

**Subject Title**: Linear Systems (Compulsory)

**Subject Code**: EIE312

**Level of Study**: 3

**Hours Assigned**
- Lecture/Tutorial: 33 hours
- Laboratory: 9 hours

**Pre-requisites**: Mathematics I (AMA201)

**Credits**: 3

**Objectives**:

(i) to provide students with basic concepts and techniques for the modelling and analysis of linear continuous-time and discrete-time signals and systems;

(ii) to provide students with an analytical foundation for further studies in Communication Engineering and Digital Signal Processing.

**Keyword Syllabus**:

- Classification of Signals: continuous and discrete-time signals, signals of special importance.

**Textbook**:


**References**:


**Method of Assessment**

- Coursework: 40%
- Examination: 60%
- Total: 100%

**Note**: To pass this subject, students must obtain grade D or above in BOTH the coursework and the examination.
Subject Description

Subject Title : Communication Fundamentals (Compulsory)
Subject Code : EIE331
Level of Study : 3
Hours Assigned : Lecture/Tutorial 28/5 hours
                 Laboratory 18 hours
Pre-requisites : Mathematics I (AMA201)
                 Mathematics II (AMA202)
Credits : 3

Objectives :

The subject aims to introduce

(i) measure of information and channel capacity,
(ii) theory and performance of analogue communication systems,
(iii) pulse modulation techniques.

At the completion of the subject, the student is equipped with the basic principles of communication engineering. The fundamentals introduced in this subject are necessary for study of higher level subjects in the field of communication engineering.

Keyword Syllabus :

Entropy, channel capacity. Double-sideband suppressed carrier, double-sideband large carrier (AM), single-sideband modulation, vestigial-sideband modulation, FDM. Narrowband FM, wideband FM, phase modulation, generation and demodulation of AM and FM signals. Noise in communication, S/N ratios for AM and FM reception. PAM, quantization and coding, PCM, delta modulation, TDM.

Textbook :


References :


Method of Assessment :

Coursework 40%
Examination 60%
Total 100%

Note : To pass this subject, students must obtain grade D or above in BOTH the coursework and the examination.
Subject Title : English in the Workplace (Compulsory)
Subject Code : ELC305
Level of Study : 3
Hours Assigned : Seminars 42 hours
Pre-requisites : English for Academic Purposes (ELC205)
Credits : 3

Objectives :
To develop those English language skills required by the students to communicate effectively in their future professional careers.

Subject Description :
The subject is designed to introduce students to the kinds of communication skills both oral and written that they may be expected to need in their future professions. These skills will be necessary for successful employment in any company/organisation where internal and/or external communication is conducted in English.

The study method is primarily based on seminars. These will include discussions, role-play, individual and group activities. Use will be made of video and tape recordings, library research, and our Centre for Independent Language Learning. Students in need of additional help will be required to attend a supplementary English programme organised by the English Language Centre.

Learning and Teaching Materials :
“English in the Workplace” published by the English Language Centre, the Hong Kong Polytechnic University and the Macmillan Publishers (China) Ltd.

Specially prepared material from the English Language Centre will be used throughout the course. In addition, lecturers will recommend additional reference materials as required.

Keyword Syllabus :
This syllabus is indicative. The balance of the components, and the weighting accorded to each will be based on the specific needs of the students.

1. Language appropriacy : introducing notions of context-sensitive language use in both spoken and written English; for example, writing e-mails and using the telephone.

2. Seeking and supplying information : practice in the oral skills required in fact-finding and job-seeking interviews, problem-solving negotiations, and conducting questionnaire surveys.

3. Workplace writing : selecting and using relevant content; appropriate style; acceptable format; structure and layout, in letters, memoranda, reports, notices for public display, proposals, presentation notes, forms and questionnaires.

4. Language development : improving and extending relevant features of students’ grammar, vocabulary and pronunciation.
References:

General


Grammar, Vocabulary and Style


Method of Assessment: Coursework 100%
Subject Description

Subject Title : Engineering Management (Elective)
Subject Code : ENG306
Level of Study : 3
Hours Assigned : Lecture/Tutorial 42 hours
Pre-requisites : Nil
Exclusions : Organisation and Management (MM302)
Credits : 3

Objectives:
To improve the students' knowledge of the basic principles involved in the organization of engineering activities that provide goods and services. To provide an appreciation of legal aspects in relation to contracting and tendering, patents, and product reliability. To make students aware of the importance of quality management.

Keyword Syllabus:
Industrial Organization: functions and types; structure; corporate objectives, strategy and policy. Industrial Management: theories; role of managers - delegation, communication, coordination, planning, control, leadership; management information systems. Project Management: matrix organization; project specification. Management of Legal Aspects: professional codes of conduct; labour ordinances; contracting, tendering, licensing, patenting; product liability. Total Quality Management. Management of Environmental Issues: sources, effects and control of environmental pollutants. Reliability and Maintenance Management: preventive, productive and reliability centred maintenance. The management of research and development; management of change due to: technical innovation, organisational change, and business process re-engineering etc.

References:

Method of Assessment:

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### Subject Description

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<tr>
<td>Hours Assigned</td>
<td>Lecture 28 hours Seminars 14 hours</td>
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<td>Pre-requisites</td>
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<td>Introduction to Management (MM201)</td>
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<td>Or Organisational Behaviour (MM211)</td>
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<td>Or Organisation &amp; Management (MM202)</td>
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<td>Or Engineering Management (ENG306)</td>
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### Role and Purpose:

This subject introduces the basic theories and concepts concerning firstly, the functions of managing a business and secondly, the study of human behaviour and its implications for the management of organisations.

### Objectives:

1. To identify the nature of managerial work in a variety of forms of organisation, taking into account the impact of the external environment.
2. To examine the functions of management - planning, organising, controlling, decision making.
3. To introduce the study of human behaviour and its implications for the management of organisations and businesses.

### Indicative Content:

1. **Managers and Management**
   1.1 Define the nature of managerial work taking into account the impacts of the external environment. Provide an overview of the evolution of Management.

2. **Organising an Enterprise**
   2.1 Review of a variety of organisations structures and the identification of the conditions under which they are appropriate.

3. **Functions of Management**
   3.1 The major elements of the following functions and their importance for the effective management of business organisations: planning, coordinating, controlling, decision making and problem solving, communication, strategic management, and quality management.

4. **People in Organisations**
   4.1 Factors such as biographical characteristics, ability, personality, perception, attitudes and values, and their effects on individual performance.

5. **The Manager's Role as a Leader**
   5.1 Motivation concepts, foundations of group behaviour, introduction to the theories of leadership, interpersonal communication.
6. Social Responsibility and Managerial Ethics
   6.1 Arguments for and against social responsibility as a business objective. Factors affecting managerial ethics. Approaches to improving ethical behaviour.

Teaching/Learning Approach:

In the lectures the general principles of the syllabus topic will be presented and developed. In the seminars, students will develop and apply the general principles of the topic in student-centred activities.

Indicative Reading:

2. Company Annual Reports (see library collection).

Recommended periodicals, newspapers:
The Asian Wall Street Journal
The Economist
South China Morning Post
World Executive’s Digest
Business Week

Recommended Academic Journals (Selective use)
Academy of Management Executive
Asia Pacific Journal of Management
British Journal of Management
Group & Organisation Management
Harvard Business Review
Journal of Business Ethics
Journal of Management Studies
Journal of Occupational & Organization Psychology
Leadership & Organisation Development Journal
Organisation Studies

Method of Assessment:

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Minimum Component Pass Grade:

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Subject Description

Subject Title: VLSI and Computer-Aided Circuit Design (Elective)
Subject Code: EIE401
Level of Study: 4
Hours Assigned:
- Lecture/Tutorial: 21 hours
- Laboratory: 21 hours
Pre-requisites:
- Electronic Circuits (EIE304)
- Basic Electronics (ENG234)
Credits: 3

Objectives:
To provide students with
(i) insights into the subject area of VLSI circuits and systems design based on silicon;
(ii) a broad-spectrum awareness of the many facets of designs involved with CAD tools;
(iii) in-depth hands-on experience on VLSI design.

Keyword Syllabus:
Overview of VLSI design process; various design methodologies; stick diagram; design rules and layout, sheet resistance and area capacitance calculations; low power and low voltage VLSI design; design for testability techniques.
Performance issues and concerns in circuit layout; delay models and timing driven placement/routing; power minimization.
Project works in hand-on chip design of MOS VLSI circuits for multi-media, communications, and computer applications.

References:

Method of Assessment:

| Coursework | 60% |
| Examination | 40% |
| **Total** | **100%** |

Note: To pass this subject, students must obtain grade D or above in BOTH the coursework and the examination.
Subject Description

Subject Title : Power Electronics (Elective)
Subject Code : EIE402
Level of Study : 4
Hours Assigned : Lecture/Tutorial 33 hours
                 Laboratory 9 hours
Pre-requisites : Electronic Circuits (EIE304)
                 Basic Electronics (ENG234)
Credits : 3

Objectives:

To familiarize students with

(i) the principles and applications of power electronics;
(ii) converter topologies, operations and control strategies;
(iii) CAD (computer-aided design) techniques as applied to power electronics;
(iv) the latest development in power electronics.

Keyword Syllabus:

An overview on power electronics; power converter topologies; modelling, analysis and control of converter circuits; cycle-by-cycle and low-frequency behaviour simulations; computer-aided design of power electronic circuits; design to meet regulatory requirements; design of magnetic components; latest development in power electronics and future trends; practical design techniques.

Textbook:


References:


Method of Assessment:

| Coursework | 40% |
| Examination | 60% |
| Total | 100% |

Note: To pass this subject, students must obtain grade D or above in BOTH the coursework and the examination.
### Subject Description

**Subject Title**: High Frequency Circuit Design (Elective)

**Subject Code**: EIE403

**Level of Study**: 4

**Hours Assigned**:
- Lecture/Tutorial: 33 hours
- Mini-project: 9 hours

**Pre-requisites**:
- Electronic Circuits (EIE304)
- Basic Electronics (ENG234)

**Credits**: 3

**Objectives**:
Designing electronic circuits in the tens and hundreds of MHz range can be a challenge because the presence of parasitics poses a lot of problems in the physical circuits. This makes designing high-frequency circuits a rather specialized subject, although much can still be resolved under the lumped circuit assumption. But as the frequency moves up to the GHz range, the use of lumped circuit models can be seriously handicapped because voltage and current change within the physical boundary of the circuit as a result of the wavelength being comparable to the dimension of the physical circuits. A different approach must be used to look at the problem. This course will look mainly at circuit design in the tens to hundreds MHz range and will touch upon some basics for the GHz range design.

**Keyword Syllabus**:
- Analogue circuit fundamentals (review), high-frequency amplifier analysis and design, high-frequency filter design, impedance matching, transmission line matching, power amplifier design.

**Textbooks**:

**References**:

**Method of Assessment**:

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**Note**: To pass this subject, students must obtain grade D or above in BOTH the coursework and the examination.
Subject Description

Subject Title: Honours Project (Compulsory)
Subject Code: EIE410
Level of Study: 4
Equivalent Hours of Study: Project Work 360 hours (inclusive of contact hours, private study, etc.)
Pre-requisites: Nil
Credits: 9

Objectives:
The main objective is learning by doing.

The project is intended to be a challenge to the students’ intellectual and innovative abilities and to give them the opportunities to integrate and apply the knowledge and analytical skills gained in the different disciplines. It should also provide students with some appreciation of the entire process of problem solving. The progress from concept to final implementation and testing, through problem definition and selection of alternative solutions, will be emphasized.

Method of Assessment:
At the completion of the project, the student will be required to do an oral presentation/demonstration of his/her project to an audience of fellow students, staff and industrialists. Two hardcopies and one softcopy of the final report, and the daily log-book are to be submitted at the end of the second semester. The reports go to a panel consisting of the project supervisor and one other member of staff of the department.

Assessment of the project will be split into 3 areas:

(i) oral presentation and assessment by a panel;
(ii) work done over the project period including daily log-book; and
(iii) final report.

A maximum of 10% of the total mark will be given to the language component of the final report.

In order to ensure that comparable standards are being used to assess the projects, a project assessment form is used to guide the panel members in the assessment exercise. The Project Panel which consists of programme leaders and staff from teaching sections will also oversee the overall standard of the projects to ensure a reasonable degree of uniformity in the assessment.
Subject Description

Subject Title : Digital Signal Processing (Elective)
Subject Code : EIE413
Level of Study : 4

Hours Assigned : Lecture/Tutorial 33 hours
                 Laboratory 9 hours
Pre-requisites : Mathematics I (AMA201)
                 Mathematics II (AMA202)
                 Linear Systems (EIE312)

Credits : 3

Objectives :

To provide students with

(i) concepts and design techniques of basic digital signal processing systems and
(ii) features and basic theories of various applications of digital signal processing.

Keyword Syllabus :

Revision on the discrete-time systems and general realization techniques, design of infinite
impulse-response (IIR) and finite impulse-response (FIR) digital filters, convolution and
implementation, discrete Fourier transform, fast Fourier transform and implementation, short-
time Fourier transform, wavelets, multiresolution analysis, introduction to random processes
and systems, autocorrelation, non-parametric and parametric models, sample DSP
applications: such as adaptive digital filtering and spectrum estimation and analysis.

Textbooks :

   (Pearson Education), 2002.

References :


Method of Assessment :

Coursework 40%
Examination 60%
Total 100%

Note : To pass this subject, students must obtain grade D or above in BOTH the coursework and the
examination.
Subject Description

Subject Title: Computer Architecture and Systems (Elective)

Subject Code: EIE414

Level of Study: 4

Hours Assigned: Lecture/Tutorial: 36 hours, Laboratory: 9 hours

Pre-requisites: Computer System Fundamentals (EIE311), Computer Programming and Basic Software Engineering (ENG221)

Credits: 3

Objectives:

To provide students with

(i) concepts and design techniques of high performance computer architectures and
(ii) features and design philosophies of modern computer systems.

Keyword Syllabus:

Taxonomy of computer architectures; pipelined architectures: memory system, cache, virtual memory, memory management; pipelined ILP and dependencies; superscalar processors, speculative execution and branch processing; multiprocessor architectures, cache coherence and memory consistency; system bus architecture.

Textbook:


References:


Method of Assessment:

Coursework: 40%
Examination: 60%
Total: 100%

Note: To pass this subject, students must obtain grade D or above in BOTH the coursework and the examination.
Subject Description

Subject Title: Multimedia Technology (Elective)
Subject Code: EIE415
Level of Study: 4
Hours Assigned: Lecture/Tutorial 33 hours, Laboratory 9 hours
Pre-requisites: NIL
Credits: 3

Objectives:

To provide students with widespread understanding of multimedia technologies. After the completion of the module, the student should be able to appreciate a wide range of techniques and standards adopted in the multimedia industry.

Keyword Syllabus:

Digital audio and video processing, multimedia standards; image and video storage system, storage media: CS-Audio, CD-ROMI and DVD; content based image and video indexing and retrieval system; multimedia integration tools: SMIL; multimedia communications: quality of service (QoS) requirements for multimedia communications, loss concealment, transport protocol support for multimedia communications, multimedia on Internet; case studies on multimedia conferencing, video-on-demand (VOD), set-top box and interactive TV.

Textbooks:


References:

5. Selected papers from IEEE Multimedia.

Method of Assessment:

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<tr>
<td>Examination</td>
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<td>Total</td>
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Note: To pass this subject, students must obtain grade D or above in BOTH the coursework and the examination.
Subject Description

Subject Title: Speech and Image Processing (Elective)
Subject Code: EIE421
Level of Study: 4
Hours Assigned:
- Lecture/Tutorial: 33 hours
- Laboratory: 9 hours
Pre-requisites:
- Digital Signal Processing (EIE413)
Credits: 3

Objectives:
(i) To provide students with basic concepts of speech and image processing.
(ii) To provide students with the principles of speech and image coding.
(iii) To explain the technologies behind speech and image recognition systems.

Keyword Syllabus:
- Fundamentals of speech science; speech production models; short-term processing of speech; linear prediction analysis; speech coding and its applications; Speech recognition; Image processing; digital image representation and visual perception; image transforms; image enhancement; image filtering and restoration; image coding and compression techniques.

Textbooks:

References:

Method of Assessment:
- Coursework: 40%
- Examination: 60%
- Total: 100%

Note: To pass this subject, students must obtain grade D or above in BOTH the coursework and the examination.
Subject Description

Subject Title: Internet and Its Management (Elective)
Subject Code: EIE423
Level of Study: 4
Hours Assigned:
- Lecture/Tutorial: 28 hours
- Laboratory: 18 hours
Pre-requisites: Computer System Fundamentals (EIE311)
Credits: 3

Objectives:
To introduce the technical aspects and management of the Internet.

Keyword Syllabus:
Reference model and protocols: TCP/IP, UDP, Domain Name System (DNS); Routing; Other protocols: Hyper-Text Transfer Protocol, Simple Mail Transfer Protocol, and Post Office Protocol; Internet Applications: TELNET, FTP, Email, WWW; Internet system configuration and management: setting up IP, DNS, internet electronic mail, Web sites; Network security.

Textbook:

References:

Method of Assessment:

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Note: To pass this subject, students must obtain grade D or above in BOTH the coursework and the examination.
Subject Description

Subject Title : Distributed Systems and Network Programming (Elective)
Subject Code : EIE424
Level of Study : 4
Hours Assigned : Lecture/Tutorials 33 hours
                   Laboratory 18 hours
Pre-requisites : Object-Oriented Design and Programming (EIE320)
Credits : 3

Objectives :
This subject will provide students with the principles and practical programming skills of developing distributed systems. By the end of the course, students are expected to understand the enabling technologies for building distributed systems. The subject also enables students to master the development skill for providing distributed services on the Web. Through a series of lab exercises, students will have the chance of developing interoperable and distributed Web applications.

Keyword Syllabus :
Introduction to Distributed Systems. Enabling Tools and Technologies for Building Distributed Systems: Networked computing; Component-based software development; Extensible Markup Language (XML). Distributed Services on the Web: Simple Object Access Protocol (SOAP); Web Services Description Language (WSDL); Universal Description, Discovery and Integration (UDDI); Web Services Security.

Textbooks :

References :

Method of Assessment :

| Coursework | 40% |
| Examination | 60% |
| Total | 100% |

Note : To pass this subject, students must obtain grade D or above in BOTH the coursework and the examination.
Subject Description

Subject Title : Data and Computer Communications (Elective)
Subject Code : EIE442
Level of Study : 4
Hours Assigned : Lecture/Tutorial 36/6 hours
                Laboratory 12 hours
Pre-requisites : Communication Fundamentals (EIE331)
Credits : 3

Objectives :
This subject aims at introducing to the students the basic knowledge about data communication and computer networking. It will stress both fundamental concepts (e.g. OSI model, protocol operations) and practical system characteristics (e.g. interface, LAN, internetworking). By going through this subject, the students will have learned the necessary foundation knowledge to design and manage data communication systems and computer networks.

Keyword Syllabus :

Textbook :

References :

Method of Assessment :
Coursework 40%
Examination 60%
Total 100%

Note : To pass this subject, students must obtain grade D or above in BOTH the coursework and the examination.
Subject Description

<table>
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<tr>
<th>Subject Title</th>
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<td>Hours Assigned</td>
<td>Lecture/Tutorial 36/6 hours</td>
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<td>Laboratory 12 hours</td>
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<tr>
<td>Pre-requisites</td>
<td>Communication Fundamentals (EIE331)</td>
</tr>
<tr>
<td>Credits</td>
<td>3</td>
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Objectives:

This subject aims at introducing to the students the basic knowledge about the telecommunication industry: its services and market, the theoretical basis about performance (queuing theory) and operation (multiplexing, switching, routing, and signaling). By going through this subject, the students will have gathered the necessary foundation information, and then be well prepared to engage into the telecommunication industry to take up assignment of job duties in various areas.

Keyword Syllabus:

Overview of Telecommunication Networks and Industry. Queuing theory and traffic engineering. PCM and digital multiplexing hierarchy: T1, E1, T2, T3, SONET, SDH. Telecommunication switching, routing, and signaling: Time switch, space switching, routing algorithm, SS7 signaling.

Textbook:


References:


Method of Assessment:

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</table>

Note: To pass this subject, students must obtain grade D or above in BOTH the coursework and the examination.
Subject Title: Digital Communications (Elective)
Subject Code: EIE446
Level of Study: 4
Hours Assigned: Lecture/Tutorial 28/6 hours
Laboratory 15 hours
Pre-requisites:
- Mathematics I (AMA201)
- Mathematics II (AMA202)
- Advanced Engineering Mathematics (EIE300)
- Communication Fundamentals (EIE331)
Exclusions: Advanced Digital Communications (EIE441)
Credits: 3

Objectives:

The aim is to produce graduates with a clear theoretical background in the manipulation of digital signals for high-speed data transmission and to equip them with sound understanding in design of some typical high-speed digital communication systems.

Keyword Syllabus:


Textbook:


References:


Method of Assessment:

| Coursework | 40% |
| Examination | 60% |
| Total       | 100% |

Note: To pass this subject, students must obtain grade D or above in BOTH the coursework and the examination.
Subject Description

Subject Title : Mobile Communications (Elective)
Subject Code : EIE447
Level of Study : 4
Hours Assigned : Lecture/Tutorial 36/6 hours
Laboratory 9 hours
Pre-requisites : Mathematics I (AMA201)
Mathematics II (AMA202)
Communication Fundamentals (EIE331)
Credits : 3
Exclusions : Wireless Communications (EIE444)
Cellular Communications Systems (EIE445)

Objectives :

This subject aims to introduce

(i) the fundamental design principles in mobile communications,
(ii) the operating principles and features of mobile communication systems: GSM, TETRA, CDMA (IS-95).

Keyword Syllabus :

Cellular concept, frequency reuse, frequency planning, co-channel interference, adjacent channel interference. Multiple access methods: FDMA, TDMA, and CDMA. Free space radio wave propagation, reflection, diffraction and scattering. Okumura & Hata models, Rayleigh, Ricean and lognormal distributions. Doppler frequency, delay spread, coherence bandwidth, and level crossing rate. Digital modulation techniques for mobile radio: quaternary phase shift keying (QPSK), \(\pi/4\)QPSK, minimum phase shift keying (MSK) and GMSK. Examples of commercial mobile systems: GSM, TETRA and CDMA (IS-95). Evolution of mobile standards.

Textbook :


References :

2. Radio Equipment and Systems (RES); Trans European Trunked Radio (TETRA); Voice Plus Data (V+D); Part 1: General Network Design, ETSI ETS 300 392-1.

Method of Assessment :

| Coursework | 40% |
| Examination | 60% |
| Total | 100% |

Note : To pass this subject, students must obtain grade D or above in BOTH the coursework and the examination.