Subject Description

Subject Title : Economics for Engineers (Compulsory)
Subject Code : AF2617
Level of Study : 2
Hours Assigned : Lecture 28 hours
                 Tutorial 14 hours
Pre-requisites : Nil
Exclusion : Economics for Engineers (AF3901)
Credits : 3

Objectives:

To introduce the fundamental concepts of economics/finance/costing and to explain how these will affect the functioning of an engineering company and contribute to decision making in engineering operations.

Keyword Syllabus:

1. Introduction to Microeconomics
   1.1 Scarcity, Choice and Opportunity Cost; Demand, Supply and Price; Profit-maximizing Objective of a Firm; Cost and Output of a Firm; Depreciation and Cost.

2. Engineering Economic Decisions

3. Introduction to Macroeconomics
   3.1 The Economic Performance of an Economy; Aggregate Demand and National Income Determination; Investment and Savings; Fiscal and Monetary Policies and their Impacts on Aggregate Demand.

4. Time Value of Money and Project Evaluation
   4.1 Economic Equivalence and Interest Formulas; Evaluation of Engineering Projects using Methods of Present Value, Annual Worth, and Internal Rate of Return.

5. Capital Budgeting Decision
   5.1 Methods of Financing, Cost of Capital, and Evaluation of Investment Alternatives.

Textbooks:


References:

<table>
<thead>
<tr>
<th>Method of Assessment</th>
<th>Coursework</th>
<th>Examination</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>50%</td>
<td>50%</td>
<td>100%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Minimum Component Pass Grade</th>
<th>Coursework</th>
<th>Examination</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(D)</td>
<td>(D)</td>
</tr>
</tbody>
</table>
Subject Description

Subject Title : Mathematics I (Compulsory)
Subject Code : AMA201
Level of Study : 2
Hours Assigned : Lecture 28 hours
                 Tutorial 14 hours
Pre-requisites : Nil
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 :
Linear algebra: Matrices and determinants, vector spaces, elementary algebra of matrices, eigenvalues and eigenvectors, normalization and orthogonality.
Ordinary differential equations: First and second order linear ordinary differential equations, Laplace transforms, convolution theorem.
Calculus and functions of several variables: Infinite series, power series, Fourier series, partial differentiation, maxima and minima, Lagrange multiplier, Taylor’s theorem.

Textbooks :

Method of Assessment :
Continuous Assessment 30%
Examination 70%
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 : 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:
Continuous Assessment 30%
Examination 70%
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: College Chinese (Compulsory)
Subject Code: CLC201
Level of Study: 2
Hours Assigned: Seminar 42 hours
Pre-requisite: Nil
Credits: 3

Objectives:

After completing the course, students are expected to:

(i) master the basic writing skills to produce fluent and precise writings for vocational purposes;
(ii) be able to apply the relevant language and presentation skills for narrative, descriptive and argumentative writings;
(iii) be able to write various kinds of practical writing in relation to business planning, promotion, administration and management;
(iv) possess the ability to read and analyse essays of different styles; and
(v) be able to learn independently.

Aims:

This course aims at fostering students’ competence in written expression including general and practical writings through practice, commentary and discussion.

Reading Lists:

1. 胡裕樹主編《大學寫作》, 復旦大學出版社, 1985。
2. 史文周主編《寫作概論》, 陝西師範大學出版社, 1991。
3. 劉孟宇, 諸孝正主編《寫作大要》, 廣州中山大學出版社, 1986。
4. 戈弋, 劉文義主編《漢語及寫作》, 北京語言學院, 1987。
5. 張會恩, 曾祥序主編《文章學教程》, 上海教育出版社, 1995。
6. 張繼緬《寫作技法八講》, 中國青年出版社, 1986。
7. 陳耀南《書面中文的本質與應用》, 香港大學出版社, 1991。
8. 陳繼梁, 張振華《說明文寫作指導》, 上海教育出版社, 1993。
9. 孫元魁, 孟慶忠編著《議論文研究與鑒賞》, 山東教育出版社, 1992。
10. 上海文藝出版社編《中國現代散文》, 上下冊, 1980。
11. 于成鯤等《現代應用文》, 復旦大學出版社, 1996。
12. 李欣主編《公務文書寫作概論》, 高等教育出版社, 1996。
13. 許秋華《中國實用文體大全》, 上海文化出版社, 1984。
14. 陳少棠《銀行應用文》, 香港三聯書店, 1997。
15. 張仁青《應用文》, 文史哲出版社, 1994。
16. 馮式《現代應用文手冊》, 中流出版社, 1995。
17. 現代應用文編寫組《現代應用文》, 星洲日報、天地圖書有限公司、萬里機構出版有限公司聯合出版, 1989。
18. 法定語文事務署《政府公文寫作手冊》, 1996。
19. 周錫駝《中文應用寫作教程》, 香港三聯書店, 1996。
20. 姚里軍《新聞寫作：藝術與技巧》，北京中國廣播電視出版社，1994。
21. 香港貿易發展局中文事務組編《中國貿易應用文》，香港三聯書店，1994。
22. 香港管理專業協會編《最新國內商業信札》第二版，香港勤缘出版社，1994。
23. 禤高德譯、黎瑞文校《新聞寫作教程》，北京新華出版社，1986。

Method of Assessment:

<table>
<thead>
<tr>
<th>Coursework</th>
<th>60%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Term-end Test</td>
<td>40%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
</tr>
</tbody>
</table>

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 : 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:

<table>
<thead>
<tr>
<th>Coursework</th>
<th>60%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Term-end Test</td>
<td>40%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
</tr>
</tbody>
</table>

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 : Logic Design (Compulsory)
Subject Code : EIE211
Level of Study : 2
Hours Assigned : Lecture/Tutorial 33 hours
                 Laboratory 9 hours
Pre-requisites : Nil
Credits : 3

Objectives :
To provide students with a broad view in both hardware and software aspects of digital systems in
general and microprocessor systems in particular, and enable them to gain understanding and skills that
will be used in later computer related courses. Emphasis will be placed on topics such as

(i) Common binary logic components found in a microcomputer system
(ii) Use and applications of programmable logic devices
(iii) Structure and organization of microprocessors
(iv) Basic assembly language programming techniques.

Keyword Syllabus :
Logic Circuit and ICs
Memory and Programmable Logic Devices
Microprocessor
Assembly Language Programming

References :
4. B.B. Brey, The Intel Microprocessors: 8086/8088, 80186/80188, 80286, 80386, 80486, Pentium,
   Pentium Pro Processor, Pentium II, Pentium III, Pentium 4, Upper Saddle River, NJ: Prentice-

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 Programming and Basic Software Engineering (Compulsory)
Subject Code   : ENG221
Level of Study : 2
Hours Assigned : Lecture/Tutorial/Laboratory 42 hours
Pre-requisites : Nil
Credits        : 3

Objectives :
(i) To introduce the fundamentals of computer systems and programming languages
(ii) To equip the students with sound skills in C/C++ languages
(iii) To equip the students with techniques for writing structured and documented computer programs
(iv) To familiarize the students with the basic concepts in software engineering

Philosophy :
The language C/C++ has been selected as the basis for this course as its well defined structure is considered well suited for teaching programming techniques to engineering students. Individual features of the language will be introduced with extensive examples. Program design approaches and techniques will also be discussed extensively in the subject. Problem-based learning approach will be used in teaching the software engineering part of this subject. The students will be expected to spend more than 50% of the assigned time on programming assignments in the tutorial/terminal room.

Keyword Syllabus :

Textbooks :

Method of Assessment : Coursework 100%
Subject Description

Subject Title : Information Technology (Compulsory)
Subject Code : ENG224
Level of Study : 2
Hours Assigned : Lecture/Tutorial 33 hours
Laboratory 18 hours
Pre-requisites : Nil
Credits : 3

Objectives :

(i) To provide the foundation knowledge in computer engineering, computer networking and data
processing that is essential to modern information system design;
(ii) To provide training in using information technology to solve practical problems in engineering.

Philosophy :

The design of this subject emphasizes both the theoretical and practical training. We believe
that while it is important to provide the foundation to allow our students to understand the
theory behind the modern information technology, it is equally important to let our students to
equip with practical skills to related information technology to enhance the work in their own
discipline. After satisfactorily completing the subject, the students are expected to have not
only the concept of the technologies concerned but also the ability of practically applying such
technologies.

Keyword Syllabus :

Evolution and applications of computers. Major hardware components of computers:
Microprocessor, Memory and I/O. Operating system case study: Linux. Internet and Internet
services. Internet programming. Introduction to computer networking. Networking models.
Network protocols: Ethernet, TCP/IP. Networking devices. Database systems. Relational
database concept. Structured Query Language (SQL). Introduction to Information systems.
Structured tool for system analysis and design. Workflow management.

References :


Method of Assessment :

<table>
<thead>
<tr>
<th></th>
<th>Coursework</th>
<th>Examination</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>40%</td>
<td>60%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td></td>
</tr>
</tbody>
</table>
Subject Description

Subject Title : Society and the Engineer (Compulsory)
Subject Code : ENG226
Level of Study : 2
Hours Assigned : Lecture 30 hours
Tutorial 12 hours
Pre-requisites : Nil
Credits : 3

Objectives:

To enable the students to

(i) appreciate the historical context of modern technology and the nature of the process whereby technology develops.
(ii) understand the social, political, economic responsibility and accountability of a profession in engineering and the organizational activities of professional engineering institutions.
(iii) appreciate the relationship between technology and environment and the implied social costs and benefits.
(iv) be aware of the short-term and long-term effects on the use of technology relating to safety, health and welfare aspects.
(v) observe the professional conduct, the legal and moral constraints relating to various engineering aspects.

Keyword Syllabus:


Environmental protection and related issues. Role of the engineer in energy conservation, ecological balance and sustainable development.

The outlook of Hong Kong’s industry, its supporting organizations and impact on development from the China Markets.


The Professional Institutions: both local and overseas. Local and overseas education systems; training of engineers.

Professional ethics, bribery and corruption including the work of the ICAC. Social responsibilities of engineers.

Intellectual property right such as patents and copyright protection. The work of the Intellectual Property Department. Contract law for engineers.

Method of Assessment:

Coursework 45%
Examination 55%
Total 100%
Subject Description

Subject Title: Basic Electrical Circuits (Compulsory)
Subject Code: ENG231
Level of Study: 2
Hours Assigned: Lecture/Tutorial 42 hours
Laboratory 9 hours
Pre-requisites: Nil
Credits: 3

Objectives:
(i) Introduce the fundamental concepts of electrical circuits through a balanced, coherent and modern approach.
(ii) Develop critical and creative approach for solving circuit problems.
(iii) Acquire the skills and knowledge required for independent learning.
(iv) Provide sufficient practical demonstrations applicable to all engineering students.
(v) Appreciate the role of simulation software such as Pspice and/or Electronic Workbench for solving circuit problems.

Keyword Syllabus:
Circuit components, DC circuits, Kirchhoff voltage and current laws, Circuit theorems, AC circuits, Phasors, Power in AC, Steady-state response, Frequency domain analysis, Fourier series, Filters, Three phase circuits, Transient response, First- and second-order systems.

Textbook:

References:

Method of Assessment:
| Coursework | 40% |
| Examination | 60% |
| Total | 100% |
Subject Description

Subject Title : Engineering Science (Compulsory)
Subject Code  : ENG232
Level of Study : 2
Hours Assigned : Lecture 36 hours
                 Tutorial 6 hours
Pre-requisites : Nil
Credits        : 3

Objectives :
To enable students to establish a broad knowledge base on the atomic structure and properties of materials and a few important engineering problems, such as energy, energy use and environmental issues.

References :

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

Coursework may include assignments and short tests.
Subject Description

Subject Title : Basic Electronics (Compulsory)
Subject Code : ENG234
Level of Study : 2
Hours Assigned : Lecture/Tutorial 42 hours
                 Laboratory 9 hours
Pre-requisites : Nil
Credits : 3

Objectives :
To familiarize students with
(i) common electronic devices and their characteristics;
(ii) the operating principle of simple BJT and FET amplifiers;
(iii) DC biasing of BJT and FET circuits;
(iv) small-signal analysis;
(v) high frequency response of BJT and FET amplifier circuits;
(vi) combinational logic circuit design.

Keyword Syllabus :
Diode circuit analysis; load line concept; diode rectifier circuits; amplifier fundamentals; ideal operational amplifier; DC biasing and large signal model of BJT transistor circuits; small signal model of BJTs and FETs; BJT and FET small signal amplifier circuits; transfer function; poles and zeros; high frequency response; Bode plots; number system; logic functions; Boolean algebra; Karnaugh map; combinational logic circuits.

Textbook :

References :

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

Subject Title : Manufacturing Technology (Elective) – Add on 11 Nov. 2003
Subject Code : ENG235
Level of Study : 2
Hours Assigned :
- Lectures – 2 hours / week for 14 weeks  28 hours
- Tutorial – 1.5 hours / week for 8 weeks  12 hours
- Tests – 1 hour x 2 weeks  2 hours
Case Studies : 3 hours / week for 2 weeks  6 hours
Pre-requisites : Nil
Credits : 3

Objectives :

This subject provides students with a basic understanding of the:

(i) Relationship between material properties and manufacturing processes so that they are able to select those that are appropriate taking into consideration green design and environmental issues.
(ii) Procedures that are currently used for planning and controlling production, recognising demand, capacity, cost, and quality considerations.
(iii) Causes of variability in production processes and the methods by which it is measured, and controlled to meet specifications of products.

Teaching and Learning Approach

This subject will be taught through a case-based approach. Students will be presented with a number of typical products that they can directly relate to. The methodology by which they are designed and produced will be developed taking into consideration selection of materials, the types and sequence of manufacturing processes, and the determination of the type of production system that is most appropriate, planning and controlling of production ensuring that cost, delivery, and quality issues are addressed. This will be done both by a selection of case studies where lectures will be given to deliver that basic knowledge appropriate to the case concerned, and by giving case studies through assignments.

References :


Method of Assessment :

Coursework 100%

Comprised of assignments, two progress tests (one at mid-semester and one at the end of the semester), and a mini-project.
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 : Industrial Centre Training I (Compulsory)
Subject Code : IC272
Level of Study : 2
Hours Assigned :
   (i) Technology Training  30 hours/week for 7 weeks
   (ii) Engineering Drawing  46 hours
       & Computer Graphics
   (iii) Industrial Safety    15 hours
Pre-requisites :
   The Hong Kong Polytechnic University entrance requirements for the 
   Degree Programme in Electronic and Information Engineering
Training Credits : 9

Objectives :

(i) The integrated training provided by The Hong Kong Polytechnic University Industrial Centre is 
intended to equip students with practical skills, techniques and technologies which are 
general and essential in the practice of electronic and information engineering. The 
integrated training also provides training in computer software. On completion of the training, 
students should acquire fundamental skills in computer graphics and animations, Web 
authoring and Internet search, database and spreadsheets, basic scientific computing and 
general computer and network skills.

(ii) Engineering Graphics provides an opportunity for student to learn and use technical graphics 
as a media to communicate, express creative ideas and describe objects. The emphasis is on 
practicing the principle and interpretation of technical drawing and to communicate design 
idea using simple sketch and industrial strength computing solution in technical graphics. In 
addition to technical graphics, students shall familiar with the application of electronic design 
automation (EDA) environment to create and design electronic circuit boards from sketch.

(iii) Industrial safety provides students with an understanding of industrial hazards and their 
control.

Keyword Syllabus :

Computer software for scientific computing, data processing, presentation, multimedia 
contents creation, web site creation, computer networking, client-server computing practise; 
practical electronics; automation and robotics; embedded controller programming, 
engineering drawing; computer modeling; electronic design automation; industrial safety.

Method of Assessment :

Please refer to the section on "Assessment of Training"
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 :

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuous Assessment</td>
<td>45%</td>
</tr>
<tr>
<td>Examination</td>
<td>55%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

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: 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:

<table>
<thead>
<tr>
<th>Coursework</th>
<th>Examination</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>40%</td>
<td>60%</td>
<td>100%</td>
</tr>
</tbody>
</table>

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:

To familiarize students with

(i) Practical Operational Amplifiers and their building blocks;
(ii) Feedback configurations, stability design concepts and oscillators;
(iii) Analog filter design.

Keyword Syllabus:

Current mirror, differential input stage and output stages; operational amplifier design; slew rate limitation; internal compensation; stability of feedback op-amp circuits; operational amplifier. Feedback and stability; magnitude and phase margins; oscillators design. Early effect and output resistance; high-frequency parasitics and Miller effect; hybrid-pi models and high-frequency responses of transistor amplifiers. Basic filter principles, transfer functions for low-pass, band-pass, high-pass, band-stop filters; frequency responses, analog filters, lossless passive realization, active filters using ideal op-amps.

Textbook:


Reference:


Method of Assessment:

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

Note: To pass this subject, students must obtain grade D or above in BOTH the coursework and the examination.
Subject Title: Integrated Analogue and Digital Circuits (Elective)

Subject Code: EIE305

Level of Study: 3

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

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

Credits: 3

Objectives:
To familiarize students with
(i) digital circuit families and basic building blocks;
(ii) introduction to Verilog styles digital design;
(iii) logic synthesis using FPGA tools;
(iv) filter design principles and circuit technologies;
(v) ASIC design methodologies.

Keyword Syllabus:
- Digital circuit families; multi-vibrators and timers; memory circuits; Verilog language, structural and behavioral specification, procedural specification, small module design methodology, different FSM styles, timing issues, low power design, FPGA; filter design principles; active RC filters, SC filters; gm-C filters; ASIC design methodologies; gate arrays; standard cells.

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**: IC Technology and Processes (Elective)

**Subject Code**: EIE306

**Level of Study**: 3

**Hours Assigned**:
- Lecture/Tutorial: 30 hours
- Laboratory: 24 hours

**Pre-requisites**: Nil

**Credits**: 3

**Objectives**:

To familiarize students with

(i) Fundamentals of semiconductors;
(ii) The operating principles of MOSFETs;
(iii) CMOS processes and operation of basic CMOS logic gates;
(iv) Emphasis is placed on hands-on experience in basic IC fabrication processes, students will fabricate MOSFETs in groups of 5.

**Keyword Syllabus**:

Semiconductor materials, carrier concentration, mobility, drift and diffusion current, Einstein relationship, energy band diagram. MOS fundamentals, basic MOSFETs, structure and operation of CMOS logic gates. Basics of device fabrication, oxidation, diffusion, photolithography, thin film deposition, MOSFET fabrication process.

**Textbook**:


**Method of Assessment**:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coursework</td>
<td>50%</td>
</tr>
<tr>
<td>Examination</td>
<td>50%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

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

Subject Title: Integrated Project (Compulsory)

Subject Code: EIE310

Level of Study: 3

Equivalent Hours of Study:
- Lecture: 6 hours
- Laboratory / Demonstration: 9 hours
- Project Work: 105 hours

(inclusive of other contact hours, private study, etc.)

Pre-requisites: Nil

Credits: 3

Objectives:

The objectives of this subject encompass not only the technical design and implementation/fabrication of electronic/information products but also the development of a production/marketing strategy. There are three tasks for the subject: Task I Market research – Students are required to assess the market needs for the product. Based on the studies students are to derive a suitable marketing strategy. Task 2: Technical design and manufacturability – In this task, students are required to perform the technical design of the product. They are also required to consider the manufacturability and the final cost of the product through careful cost control and component selection to ensure the profitability of the final product. Task 3: Product implementation – the product must be implemented/fabricated for demonstration.

Operation:

Students will be grouped into groups of three or four. To each group, an academic supervisor will be assigned. Each student will take turn in serving as the Team Leader to lead the group to complete the task assigned. Each task will be allocated a certain period of time to complete. At the end of each task, each group will submit a Task Report and to give a presentation on the work performed during the period. Upon the completion of the project, each group will give a demonstration of the completed product and a final report and presentation. Students are also required to keep a detailed log of the work performed during the entire period. The log-books are to be examined and signed by the supervisor on a monthly basis. At the end of the project, the log-book will be collected and graded.

Method of Assessment:

Throughout the duration of the project, supervisors make themselves available for discussions with the student groups at the meetings arranged at mutually convenient times. On these occasions, supervisors may, at their discretion, rate and record their impressions and abilities according to the attributes detailed below.

- INSIGHT as evidenced by an ability to understand and appreciate issues
- DRIVE as evidenced by diligence and tenacity
- CREATIVITY as evidenced by ingenuity and imagination
- COMMUNICATION as evidenced by an ability to express ideas clearly and succinctly

At the completion of each task, the Team Leader is required to give an oral presentation. This is assessed by a panel of academic staff. The presentation is rated according to the response to questions aimed at determining for example the appreciation of the relevance of his/her particular part in the activity and of its inter-relation to those of the other members. The extent to which a variety of "solutions" has been proposed and critically examined is also considered, whether it is legitimate to regard any strategy finally proposed as being optimal. A most important element to be assessed is the extent of the awareness of what limitations
there are any recommendations and proposals made consequent on having access to incomplete information. Where such gaps exist, what effort would be required, what cost involved to rectify these omissions, what would be the attendant benefit to be anticipated from this traditional effort and whether, therefore, it would be worthwhile to undertake it. At this time students are required to submit two reports for the task, a Team Report and a Team Leader’s Report.

The Team Report should, where possible segregate the individual contribution of each student since this allows a mark for the individual as well as the team itself. The grade for these will be entered onto the standardised assessment guide mentioned above.

The final grade for each task is computed by:

<table>
<thead>
<tr>
<th></th>
<th>Points</th>
<th>Applicability to</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Team Leader</td>
</tr>
<tr>
<td>Team Report</td>
<td>45</td>
<td>Yes</td>
</tr>
<tr>
<td>Oral Presentation and Viva</td>
<td>20+10</td>
<td>Yes</td>
</tr>
<tr>
<td>The Team Leader’s Report</td>
<td>10</td>
<td>Yes</td>
</tr>
<tr>
<td>Team members’ assessment of the Team Leader</td>
<td>5</td>
<td>Yes</td>
</tr>
<tr>
<td>Team Leader’s assessment on team members</td>
<td>10</td>
<td>No</td>
</tr>
</tbody>
</table>

Total points for team leader: 90 points
Total points for each team member: 65 points

The final grade for the complete project is then computed for each student, which takes into consideration their performance during the three tasks of the project.

The weighing for each task is as follows:

Task 1: 25%
Task 2: 30%
Task 3: 45%
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 :


References :


Method of Assessment :

| Coursework | 40% |
| Examinations | 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 :

Textbook :

References :

Method of Assessment :

<table>
<thead>
<tr>
<th></th>
<th>Coursework</th>
<th>Examination</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>40%</td>
<td>60%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td></td>
</tr>
</tbody>
</table>

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

Subject Title: Data Structures and Databases (Elective)
Subject Code: EIE316
Level of Study: 3
Hours Assigned:
- Lecture/Tutorial: 33 hours
- Practical Work: 9 hours
Pre-requisite:
- Computer Programming and Basic Software Engineering (ENG221)
Credits: 3

Objectives:

To provide fundamental knowledge of data structures and algorithms.

To introduce concepts of data models, principles and practical skills of relational database design, concepts and principles of database management systems.

After the completion of this subject, students should be able to appreciate and to master (i) methods for organizing, reorganizing, moving, exploring, and retrieving data in digital computers, and, (ii) fundamental analysis of those techniques.

Keyword Syllabus:

Lists; Linked list; indexes; trees; sorting algorithms; Algorithm analysis and design; dynamic programming. File structures; entity-relationship; architecture of database information systems; data models; relational database design (relational algebra and calculus, functional dependency and normalization); data definition and manipulation; structured query language; database administration; concurrency control; database security and recovery. Case studies on features and usage of one or two relational database systems.

Textbooks:


References:


Method of Assessment:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coursework</td>
<td>40%</td>
</tr>
<tr>
<td>Examination</td>
<td>60%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Subject Title</th>
<th>Object-Oriented Design and Programming (Elective)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject Code</td>
<td>EIE320</td>
</tr>
<tr>
<td>Level of Study</td>
<td>3</td>
</tr>
<tr>
<td>Hours Assigned</td>
<td>Lecture/Tutorial: 33 hours</td>
</tr>
<tr>
<td></td>
<td>Laboratory: 18 hours</td>
</tr>
<tr>
<td>Pre-requisites</td>
<td>Computer Programming and Basic Software Engineering (ENG221)</td>
</tr>
<tr>
<td>Credits</td>
<td>3</td>
</tr>
</tbody>
</table>

Objectives:

This course will provide students with the principles of object orientation from the perspective of Java implementation and UML. Students are expected to learn the concepts of and practical approaches to object-oriented analysis, design and programming using UML and Java.

Keyword Syllabus:

Software Engineering; software process models; object-oriented paradigm; classes and objects; encapsulation, inheritance and polymorphism; Java technologies; object-oriented Programming with Java; Web Programming with Java; Unified Modeling Language (UML); structural modeling; behavioral modeling; architectural modeling.

Textbooks:


References:


Method of Assessment:

<table>
<thead>
<tr>
<th></th>
<th>Coursework</th>
<th>40%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Examination</td>
<td>60%</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>100%</td>
</tr>
</tbody>
</table>

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

Subject Title: Interface and Embedded Systems (Elective)  
Subject Code: EIE322  
Level of Study: 3  
Hours Assigned: Lecture/Tutorial 33 hours, Laboratory/Demonstration 9 hours  
Pre-requisites: Logic Design (EIE211)  
Credits: 3

Objectives:

To provide students with the concepts and techniques in designing embedded software and hardware interfaces.

Keyword Syllabus:

Microcontroller architecture, interrupt timer, pulse measurement and generation, external driver interfaces, sensing and generation of analogue signals. Industrial I/O interfaces/buses: transaction protocols, timing specifications and arbitration. Application-specific memory devices and complex I/O devices. CPU bus interfacing techniques: timing analysis; buffer control; data alignment and routing. Embedded software architectures for real-time applications. Real-time OS; task scheduling, CPU utilization, RMS theorem, task latency analysis, semaphores and priority inversion. Development and debugging tools.

Textbooks:

References:

Method of Assessment:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coursework</td>
<td>40%</td>
</tr>
<tr>
<td>Examination</td>
<td>60%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
</tr>
</tbody>
</table>

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 Description

Subject Title: Electromagnetics (Elective)
Subject Code: EIE332
Level of Study: 3
Hours Assigned: Lecture/Tutorial 28/6 hours
Laboratory 15 hours
Pre-requisites: Mathematics I (AMA201)
Mathematics II (AMA202)
Credits: 3

Objectives:

The subject aims to introduce

(i) the static electric and magnetic field,
(ii) the Maxwell’s equations and wave propagation,
(iii) the fundamentals of antennas,
(iv) the basic concept of transmission line.

At the completion of the subject, the student is introduced to the basic electromagnetic theory and its applications which are necessary for the subject development in the next level option.

Keyword Syllabus:

Static electric field, Poisson’s and Laplace’s equations, steady magnetic field. Maxwell’s equations, wave equations, plane wave, reflection and refraction. Hertzian dipole, antenna patterns, thin linear antennas, receiving antennas, Friis transmission equation. Uniform and terminated transmission lines, Smith chart and impedance matching.

Textbook:


References:


Method of Assessment:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coursework</td>
<td>40%</td>
</tr>
<tr>
<td>Examination</td>
<td>60%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
</tr>
</tbody>
</table>

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

Subject Title: System and GUI Programming (Elective)
Subject Code: EIE335
Level of Study: 3
Hours Assigned:
- Lecture/Tutorial: 33 hours
- Laboratory: 9 hours
Pre-requisites: Computer Programming and Basic Software Engineering (ENG221)
Credits: 3

Objectives:
This subject aims to provide students with a basic understanding of system programming for various operating systems (OS). Students are expected to have a closer look at various functions of a computer operating system from a programmer’s perspective. Two major areas of study will be the OS system call and the GUI programming. This course will provide a practical application of material from operating systems, data structures and object-oriented design.

Keyword Syllabus:
- GUI programming – user interface and window environment, Graphics Device Interface (GDI); GUI in Microsoft Foundation Classes (MFC), X window programming; Elements of a window, windows message system; asynchronous input; user events (keyboard and mouse); menus; controls. Win32 Application Programming Interface (API), UNIX system services; File system, management files and file system, device I/O, case study: Win32 file system and its system calls; Architecture of memory management: virtual memory and heap, case study: Win32 virtual memory management and heap routines; process and thread management, components of a process, thread: light weight process, thread synchronization, case study: creating threads and processes in Win32, creating POSIX threads in UNIX.

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: Industrial Attachment (To be taken in lieu of IC367)
Subject Code: EIE389
Level of Study: 3
Hours Assigned: A minimum of 4 weeks
Pre-requisites: Nil
Training Credits: 4

Objectives:
To give students an exposure to the industrial working environment through attachment in an industrial company for a minimum of 4 weeks in the summer between Year 2 and Year 3. The objective of this industrial attachment is to enhance students’ problem solving and leadership abilities and to promote the sense of responsibility and positive working attitude. Students will acquire working experience in a real industrial environment and hands-on experience in the use of modern facilities, fabrication and documentation of their work in electronic and information industry.

Method of Assessment: Continuous assessment 100%
Subject Description

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.

Method of Assessment: Coursework 100%
Subject Description

<table>
<thead>
<tr>
<th>Subject Title</th>
<th>Engineering Management (Elective)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject Code</td>
<td>ENG306</td>
</tr>
<tr>
<td>Level of Study</td>
<td>3</td>
</tr>
<tr>
<td>Hours Assigned</td>
<td>Lecture/Tutorial 42 hours</td>
</tr>
<tr>
<td>Pre-requisites</td>
<td>Nil</td>
</tr>
<tr>
<td>Exclusions</td>
<td>Organisation and Management (MM302)</td>
</tr>
<tr>
<td>Credits</td>
<td>3</td>
</tr>
</tbody>
</table>

**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:**

<table>
<thead>
<tr>
<th></th>
<th>Coursework</th>
<th>Examination</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>30%</td>
<td>70%</td>
<td>100%</td>
</tr>
</tbody>
</table>
Subject Description

Subject Title : Industrial Centre Training II (Compulsory)

Subject Code : IC367

Level of Study : 3

Hours Assigned : 30 hours/week for 4 weeks

Pre-requisites : Industrial Centre Training I (IC272)

Training Credits : 4

Objectives:

Industrial Centre Training II takes the form of technical projects with typically 4 to 6 students in a team working in the Industrial Centre for a minimum of 4 weeks. The objective of this training course is to develop or promote the personal ability of students; creativity, leadership, courage, responsibility, working attitude, problem solving power and presentation style when they are working in a project team.

On completion of this training course, students will be expected to gain confidence to overcome difficulties and to handle open-ended problems in their future careers. Students will acquire hands-on experience in prototyping an electronic product or an application software and present their work to prospective clients. In addition, due to the complexity of project in a simulated industrial training environment, students will be expected to gain hands on experience of using modern facilities in the design, fabrication and documentation of their work. Student will be expected to gain a good understanding of the importance of costs in related to any decisions making; their impacts on project, limitation, and factors when selecting different processes, approaches and materials in electronics and information technology industry.

Keyword Syllabus:


Method of Assessment:

Please refer to the section on “Assessment of Training”.
Subject Description

Subject Title : Organisation and Management (Elective)
Subject Code : MM302
Level of Study : 3
Hours Assigned : Lecture 28 hours
                 Seminars 14 hours
Pre-requisites : Nil
Exclusions : Introduction to Management (MM201)
             Or
             Organisational Behaviour (MM211)
             Or
             Organisation & Management (MM202)
             Or
             Engineering Management (ENG306)
Credits : 3

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:

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

Indicative Content:

1. Organising an Enterprise
   1.1 Review of a variety of organisations structures and the identification of the conditions under which they are appropriate.

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

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:**

8. Company Annual Reports (see library collection).

**Recommended periodicals, newspapers:**

The Asian Wall Street Journal
The Economist
South China Morning Post
World Executive’s Digest

**Method of Assessment:**

| Coursework | 50% |
| Exam | 50% |
| Total | 100% |

**Minimum Component Pass Grade:**

Coursework: (D)
Exam: (D)
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:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coursework</td>
<td>60%</td>
</tr>
<tr>
<td>Examination</td>
<td>40%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Subject Title</th>
<th>High Frequency Circuit Design (Elective)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject Code</td>
<td>EIE403</td>
</tr>
<tr>
<td>Level of Study</td>
<td>4</td>
</tr>
<tr>
<td>Hours Assigned</td>
<td>Lecture/Tutorial 33 hours</td>
</tr>
<tr>
<td></td>
<td>Laboratory 9 hours</td>
</tr>
<tr>
<td>Pre-requisites</td>
<td>Electronic Circuits (EIE304)</td>
</tr>
<tr>
<td></td>
<td>Basic Electronics (ENG234)</td>
</tr>
<tr>
<td>Credits</td>
<td>3</td>
</tr>
</tbody>
</table>

**Objectives:**

In the pre-requisite subjects, students are acquainted with basic analogue circuit techniques and some commonly used analogue configurations. This subject extends these concepts in a design-oriented approach in important high frequency applications. A portion of this subject is devoted to non-linear analogue circuit design which serves to complement other existing subjects in communications circuits.

**Keyword Syllabus:**

Analogue circuit fundamentals, high-frequency analysis and design, design-oriented analysis techniques, noise analysis; MOS amplifier and switch-capacitor filters, distortion analysis; RF circuit elements and design, nonlinear analogue circuits, low-power design.

**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 : Circuits for Consumer Electronics (Elective)
Subject Code : EIE405
Level of Study : 4
Hours Assigned : Lecture/Tutorial 33 hours
Laboratory 9 hours
Pre-requisites : Logic Design (EIE211)
Electronic Circuits (EIE304)
Basic Electronics (ENG234)
Credits : 3

Objectives :

This subject aims
(i) to introduce the operation and basic building blocks for some common consumer electronics products; and
(ii) to familiarize students with the top-down design principles of selected consumer electronics products and some design standards in the development of consumer electronics products.

Keyword Syllabus :

Operating principles of selected consumer electronics products such as audio-visual products (e.g., hi-fi systems, DVD, VCD, CD, MP3 players, digital video recorders), telecom products (e.g., mobile phones, WLAN), portable computing devices (e.g., PDA, notebooks), smart cards, infrared/RF controllers, etc.

Common analog and digital building blocks such as DSP chips, sensors, filters, amplifiers, display driver circuits, embedded systems, RF circuits, etc.

Top-down design principles of selected systems (e.g., stereo systems and colour displays); industrial standards of selected audio-visual systems (e.g., NTSC, MP3, etc.); safety and EMC requirements (e.g., IEC-1000).

Textbook :


References :


Method of Assessment :

<table>
<thead>
<tr>
<th>Coursework</th>
<th>Examination</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>40%</td>
<td>60%</td>
<td>100%</td>
</tr>
</tbody>
</table>

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. A viva will be conducted by the panel.

Assessment of the project will be split into 3 areas:

(i) oral presentation, viva 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 Management Team will also oversee the overall standard of the projects to ensure a reasonable degree of uniformity in the assessment.
Subject Description

Subject Title: Artificial Intelligence (Elective)
Subject Code: EIE411
Level of Study: 4
Hours Assigned: Lecture/Tutorial 33 hours, Laboratory/Demonstration 9 hours
Pre-requisites: Computer Programming and Basic Software Engineering (ENG221)
Credits: 3

Objectives:
(i) to introduce the student the major ideas and techniques of Artificial Intelligence (AI);
(ii) to develop an appreciation for various issues in the design of intelligent internet and multimedia systems;
(iii) to provide the student with programming experience from implementing AI techniques and simple AI systems.

Keyword Syllabus:
Intelligent Agents, Blind and Informed Search Methods, Game Playing, Logical Agents, Inference in First-Order Logic, Knowledge Representation, Planning and Acting in the Real World, Uncertainty, Probabilistic Reasoning Systems, Machine Learning, Decision Trees, Knowledge in Learning, Agents that Communicate, Text Processing, Robotics, Applications of AI techniques to Internet and Multimedia Systems.

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 : 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 :

<table>
<thead>
<tr>
<th>Coursework</th>
<th>Examination</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>40%</td>
<td>60%</td>
<td>100%</td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th></th>
<th>Coursework</th>
<th>Examination</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>40%</td>
<td>60%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td></td>
</tr>
</tbody>
</table>

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-ROM and DVD; content based image and video indexing and retrieval system; multimedia integration tools: SMIL; game development; 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**:  
| 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 : e-Commerce Infrastructure and Processes (Elective)
Subject Code : EIE417
Level of Study : 4
Hours Assigned : 
  Lecture 22 hours
  Tutorial 12 hours
  Mini-project 8 hours
Pre-requisites : 
  Logic Design (EIE211)
  Computer Programming and Basic Software Engineering (ENG221)
Credits : 3

Objectives :
This subject aims
(i) to introduce the infrastructure of E-commerce and the processes involved in realizing business transactions by networked digital technologies;
(ii) to introduce relevant E-commerce business models as well as some popular E-commerce applications.

Keyword Syllabus :
Review of the Internet operation and network structure; connectivity and navigation; E-commerce software design (e.g., database, intelligent agents, search engines, etc.); web metrics (e.g., collection of users’ data); business models (e.g., brokerage, advertising, infomediary, utilities, etc.); markets and distributions; customer relationship management; encryption methods; public key cryptography; secure protocols for business transactions (e.g., SSL, SET); digital signatures; firewalls, proxy services and application gateways; case studies (e.g., ebay.com, amazon.com); some related issues (e.g., trust, network privacy, intellectual property).

Indicative Reading List :

Method of Assessment :

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coursework</td>
<td>40%</td>
</tr>
<tr>
<td>Examination</td>
<td>60%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th></th>
<th>Coursework</th>
<th>Examination</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>40%</td>
<td>60%</td>
<td>100%</td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coursework</td>
<td>40%</td>
</tr>
<tr>
<td>Examination</td>
<td>60%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
</tr>
</tbody>
</table>

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/Tutorial: 33 hours
- Laboratory: 9 hours

Pre-requisites:
- Computer Programming and Basic Software Engineering (ENG221)

Credits: 3

Objectives:

This subject will provide students with the principles of distributed systems and cluster computing. By the end of the course, students are expected to understand the enabling technologies for building distributed systems and also appreciate the hardware and software tradeoffs for application performance, development, and management on a cluster of computers. The subject also enables students to master the development skill for providing distributed services on the Web. Through mini-projects, students will work as a team to develop 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
- Cluster computing; Software and Hardware for cluster computing; Clustering technologies

Textbooks:


References:


Method of Assessment:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coursework</td>
<td>40%</td>
</tr>
<tr>
<td>Examination</td>
<td>60%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
</tr>
</tbody>
</table>

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

Subject Title: Telecommunication Networks (Elective)
Subject Code: EIE443
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 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:
- 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**: 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**:  

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coursework</td>
<td>40%</td>
</tr>
<tr>
<td>Examination</td>
<td>60%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100%</td>
</tr>
</tbody>
</table>

**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).

Textbook:


References:

1. Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D), Designers’ guide; Part 1: Overview, technical description and radio aspects, ETSI ETR 300-1.
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.