THE HONG KONG POLYTECHNIC UNIVERSITY
香港理工大學

Department of
Electronic and Information Engineering
電子及資訊工程學系

BEng (Hons) Degree Programme in Electronic and Information Engineering

Code: 42470; Full-time, Credit-based

Study Planner

For 2012/13 Cohort of Students and Onwards

Introduction

This small booklet is designed to help you as a student of the *BEng(Hons) in Electronic and Information Engineering* (42470) to plan your 4-year (or 5-year if you choose the sandwich option) study so that you can:

(i) identify your educational goal,

(ii) select the subjects you like best, and

(iii) prepare yourself sufficiently for your chosen career pathway and future professional development

This booklet should be read together with the definitive programme document of the *BEng(Hons) in Electronic and Information Engineering* (42470).

Road to Professional Development

The programme you are currently enrolled in is *BEng(Hons) in Electronic and Information Engineering*. Our programme is designed to equip you with the necessary skills and up-to-date knowledge in areas of Information and Communication Technology (ICT). It is *accredited* by the Hong Kong Institution of Engineers (HKIE) (www.hkie.org.hk). On graduation, you will obtain the award "BEng(Hons) Degree in Electronic and Information Engineering" and you will also satisfy the education requirement of the HKIE for the full membership. With suitable training and working experience obtained, you may apply for full membership of HKIE. Hence by studying this programme, you are already on the road to the professional development of the ICT profession.

Subjects in the Programme

Engineering is a vast and rapidly changing field, so is the field of ICT. To provide students with sufficient opportunity to acquire a sound foundation and to specialize in a particular area, our programme is designed with compulsory and elective subjects. *Compulsory* subjects are fundamental and core subjects that provide you the basis of EIE. You must study and pass all the compulsory subjects in the programme. Different students might have different interests or abilities in different areas. There are *Elective* subjects that students may choose to study in order to develop their specialization

according to their own interests. The elective subjects in this programme can be categorized into different areas such as *circuits and microelectronics*, *communication*, *computer and information engineering*. By choosing the set of elective subjects, you engage in a particular study pathway characterized as a *stream*.

Streams

A *stream* is characterized by the set of elective subjects you shall choose to study. The stream you have chosen would represent your area of specialization. You will have more competitive edge when you look for jobs in areas relevant to your stream. Hence you should decide on the stream carefully to make sure that (*i*) you are interested in the areas corresponding to that stream, (*ii*) you will master the subjects in that stream thoroughly, and (*iii*) you are prepared to pursue your future career in these areas on graduation. The followings are the streams that you may choose in this programme:

Stream Code	**Stream Title**
CCT	Circuits
MCE	Microelectronics
WOC	Wireless and Optical Communication
CMN	Communication Network
CPE	Computer Engineering
IT	Information Technology
MMT	Multimedia Technology

You may find the full list of elective subjects that define these streams in Appendix I of this booklet. You should take at least 4 EIE technical electives belonging to a stream in order to specialise in that particular stream.

(1) Circuits Stream

Stream Specialization

By studying this stream, you will specialize in the electronic circuits area. You will learn in-depth knowledge about analog digital circuits and their modern design methods. You will also learn various applications in renewable energy, energy conversion, and telecommunication.

Prospect

If you have taken this stream, a career that requires application of electronic circuits skills and knowledge will be highly appropriate for you. There are various job opportunities in this area, such as: consumer electronic products design and manufacturing; telecommunication system design, manufacturing, and maintenance; and integrated circuits design and fabrication. Relevant job positions include Electronic Engineer, Design Engineer, IC Design Engineer, etc. Companies that have recruited our graduates or had openings in these areas in the past include Soloman Systech, ASTRI, ASM, AML, Fujitsu, etc. If you like to make use of your knowledge of electronic circuits to design something new and useful to solve some problems, this stream will be suitable for you.

(2) Microelectronics Stream

Stream Specialization

Nowadays, many electronic products are characterized by their high complexity, small size, and portability. This is a result of application of microelectronics technology in these products. The major electronic components that can be found in most electronic products are Integrated Circuits (ICs). If you are interested in understanding how ICs can be miniaturized while performing various complicated functions, this stream will be suitable for you. By studying this stream, you will specialize in the microelectronics area. You will study the process of making ICs and Very Large Scale Integration (VLSI) ICs. You will also have a sense of how nanoscience and technology are used as one of the approaches to miniaturizing ICs.

Prospect

If you choose this stream as your specialization, you will have competitive edge in jobs calling for the knowledge of IC design on graduation. Graduates from this stream will be able to engage in job positions such as Design Engineer in IC, ASIC, Circuits, Power Electronics, ...etc. You will also find jobs in areas related to IC verification, testing, packaging. Companies which have such openings include Soloman Systech, ASTRI, Vanguard Business Services, SAE Magnetics, IC 3E,etc.

(3) Wireless and Optical Communication Stream

Stream Specialization

Nowadays, you will find wireless communication almost everywhere anytime. You will use your smartphone to browse the Internet through the 3G or 4G data services while you are travelling on the MTR or on bus. You may use your notebook computer or tablet PC to connect to the Internet through the Wi-Fi connection at your school or at home. Optical communication becomes a very popular broadband access method in Hong Kong recently. Many households have the "Fibre-To-The-Home" facility, while the bulk of Internet data travel from Hong Kong to foreign countries over the optical fibre network.

By studying this stream, you will specialize in areas of wireless communication and optical communication. You will acquire solid foundation knowledge about communication, computer networks, Internet technologies, electromagnetic waves properties, optical networks, and wireless communication.

Prospect

If you study this stream, you will have competitive edge in job openings from mobile phone and smartphone companies, large banks, telecommunication service providers, etc. in areas related to mobile technology in iOS, Android platforms, wireless communication, optical communication. Companies that have openings in these areas include PCCW, ASTRI, G4S International, SmarTone, HSBC, Hutchison Telecommunications (HK) Ltd., etc. You will engage in jobs that require application of skills and knowledge in Local Area Networks, Wide Area

Networks, Wi-Fi, RF design, broadband wireless, system planning, network planning and design.

(4) Communication Network Stream

Stream Specialization

The Internet has become an indispensible part of our daily lives due to the rapid development of technologies in platforms such as smartphones and tablets, and proliferation of services such as social networking, instant messaging, and cloud computing. If you study this stream, you will learn the solid foundation about communication and computer networks, and the various applications in mobile networking, optical communication and network, Internet Protocol (IP) network technology, network security, and network management. You will be competent to take popular examinations in the network area such as the CCNA (Cisco Certified Network Association) examination.

Prospect

If you study this stream, you will have competitive edge in areas that require good knowledge and skills in computer networks, protocols, network management, network security, network design, network performance evaluation. Relevant job openings in these areas include Network Engineer, Network Administrator, Network Specialist, Network Engineer, Network Security Analyst. Companies that have these kinds of openings include PCCW, HSBC, Hong Kong Jockey Club, Hong Kong Broadband Network, AML Group Holdings Ltd., New World Telecommunication Ltd., other IT service providers, etc.

(5) Computer Engineering Stream

Stream Specialization

The compulsory subjects of this stream will give you a good foundation about computer hardware and software. In the higher level, it is characterized by elective subjects such as EIE4110 Introduction to VLSI and Computer-Aided Circuit Design, EIE4111 Advanced VLSI and Computer-Aided Circuit Design, and

EIE4414 Computer Architecture and Systems. If you study for this stream, you will specialize in areas related to computer hardware and software.

Prospect

Since computers are widely used in different applications and by companies and enterprises, a specialization in the Computer Engineering stream will provide you a competitive edge in related jobs such as Computer Engineer, Computer Officer, Analyst, Programmer, IT Support Engineer, Application Developer, Software Engineer, System Administrator, so on and so forth. Government departments, companies that have business related to computer, network, IT systems will have openings for these jobs.

(6) Information Technology Stream

Stream Specialization

This stream is characterized by the elective subjects such as EIE3112 Database System, EIE3333 Data Communications, EIE3320 Object-Oriented Design and Programming, EIE4102 IP Networks, EIE4106 Network Management and Security, EIE4108 Distributed Systems and Cloud Computing. If you study for this stream, you will specialize in IT-related areas such as database, networking, cloud programming, and IT management.

Prospect

With the growing popularity of the Internet applications, graduates from this stream will have competitive edge over jobs related to IT, networking, database, and programming. They will take up posts such as Data Analyst, IT Officer, Network Administrator, Analyst Programmer, System Engineers, etc. in companies, enterprises, banks, education institutes and government departments.

(7) Multimedia Technology Stream

Stream Specialization

The compulsory subjects of this stream will give you a good foundation about multimedia signals and system properties. In the higher level, it is also characterized by elective subjects such as EIE4100 Computer Vision and Pattern Recognition, EIE4105 Multimodal Human Computer Interaction Technology, EIE4415 Multimedia Technology, EIE4435 Image and Audio Processing, and EIE4448 Bioengineering Signals and Systems. If you study for this stream, you will specialize in areas related to signals and systems and related applications in multimedia.

Prospect

Graduates from this stream will have competitive edge over jobs such as Multimedia Designer, Web Designer, Software Engineer, Game Designer, Engineer for Audio and Video products, Multimedia Production Officer, Programmer, and Game Designer.

Appendix 1

Streams and Constituent Subjects

Subject Code	Subject Title	CR	Category	Stream*						
				CCT	MCE	WOC	CMN	CPE	IT	MMT
EIE3105	Integrated Project	6	COM/ELE					X		
EIE3109	Mobile Systems and Application Development	3	ELE					X	X	
EIE3112	Database System	3	ELE						X	
EIE3305	Integrated Analogue and Digital Circuits	3	ELE	X				X		
EIE3306	IC Technology and Processes	3	ELE		X					
EIE3320	Object-Oriented Design and Programming	3	ELE						X	
EIE3XXX	Communication Networks	3	ELE			X	X		X	
EIE3338	Applied Electromagnetics	3	ELE			X				
EIE4100	Computer Vision and Pattern Recognition	3	ELE							X
EIE4102	IP Networks	3	ELE				X		X	
EIE4103	Mobile Computer System Architecture	3	ELE					X		
EIE4104	Mobile Networking	3	ELE			X	X			
EIE4105	Multimodal Human Computer Interaction Technology	3	ELE							X
EIE4106	Network Management and Security	3	ELE				X		X	
EIE4107	Wireless Communications	3	ELE			X				
EIE4108	Distributed Systems and Cloud Computing	3	ELE						X	
EIE4110	Introduction to VLSI and Computer-Aided Circuit Design	3	ELE	X	X			X		
EIE4111	Advanced VLSI and Computer-Aided Circuit Design	3	ELE	X	X			X		
EIE4402	Power Electronics	3	ELE	X	X					
EIE4414	Computer Architecture and Systems	3	ELE					X		

Subject Code	Subject Title	CR	Category	Stream*						
				CCT	MCE	WOC	CMN	CPE	IT	MMT
EIE4415	Multimedia Technology	3	ELE							X
EIE4432	Web Systems and Technologies	3	ELE						X	
EIE4435	Image and Audio Processing	3	ELE							X
EIE4448	Bioengineering Signals and Systems	3	ELE							X
EIE4449	Optical Communication Systems and Networks	3	ELE			X	X			
EIE4450	Nanoscience and Technology for Electronic Engineering	3	ELE		X					
EIE4451	Circuits for Telecommunications	3	ELE	X						

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