MINISTRY OF EDUCATION AND TRAINING
HCMC UNIVERSITY OF TECHNOLOGY AND EDUCATION

Form No. 18

C. Public report on subjects of every course and major

Electronics and Telecommunication Engineering Technology (High-quality program)

No.	Academic Year	Subject	Subject's Goals	Number of Credits	Semester Credit Hours	Methods of Student Assessment
1.	**2016**	**Basic Electronics**	This subject provides students with the basics of materials for manufacturing electronic components. It presents structures, features and applications of some basic electronic components such as Diodes, Transistors, SCR, TRIAC, DIAC, OP-AMP and 4-layer semiconductor components, optoelectronic components. Its instructions help students analyze and calculate parameters and designs of basic electronic circuits such as rectifier circuits, clipping circuits, DC power circuits, small signal amplifiers, power amplifiers, transistor switching circuits, oscillator circuits, SCR control circuits, TRAC, DIAC, optical resistance, opto and circuits in practical uses.	**4**	60 in-class periods in 15 weeks (4 periods/week)	Presented in the syllabus of the subject
2.	**2016**	**Power Electronics**	This subject equips students with the knowledge of basic power electronic components and power conversion circuits such as AC-to-DC converter	**3**	45 in-class periods in 15 weeks (3 periods/week)	Presented in the syllabus of the subject

			circuits without transformer; AC-to-DC converter circuits with transformer; Rectifier circuits with current reversal; AC switching control circuits; DC-to-DC converter circuits; Inverter circuits, etc. Also, it also provides methods to calculate and design rectifier power supplies, principles of producing synchronous control pulses for SCR and specialized software to simulate basic electronic circuits.			
3.	**2014**	**Electronics Practical Seminar**	This subject provides students with practical knowledge in the fields of electronics and industrial electronics.	**1**	15 in-class periods in 5 weeks (3 periods/week)	Presented in the syllabus of the subject
4.	**2014**	**RFID Technology**	This subject equips students, majoring in Electronic and Telecommunication Engineering Technology, with basics of radio frequency identification technology. It presents diagrams, structures, protocols, operational principles of components of RFID systems including RFID tags, RFID readers, software systems, etc. It also introduces pros, cons, future developement and standards of RFID technology. Moreover, it highlights some practical application of RFID technology in daily life such as object tracking and tracing, in-stock goods monitoring and controlling, asset monitoring and management, anti-theft, electronic payment, access controlling, anti-tampering, etc. Its instructions help students to plan, justify, design and	**2**	30 in-class periods in 15 weeks (2 periods/week)	Presented in the syllabus of the subject

			implement a RFID solution.			
5.	**2016**	**Digital Electronics**	This subject provides students with knowledge of digital systems, basic logic gates, basic Boolean algebra theorems, combinational circuits, sequential circuits, operational structures of basic digital circuits such as TTL and CMOS, feature specifications of digital microchips, classifications of microchips, principles of analog and digital switching, operational structures and applications of memory, principles of digital oscillator circuits.	**3**	45 in-class periods in 15 weeks (3 periods/week)	Presented in the syllabus of the subject
6.	**2014**	**Machine Learning (Industrial Electronics)**	This subject aims to provide students with basics of machine learning. It generally presents basic knowledge of machine learning, including how to build learning and adaptive systems for practical applications. It includes topics of concept learning, neuron identifications, vector support machines and some related methodologies. The subject also features topics, introduction of related software and some applications on signals and images.	**2**	30 in-class periods in 15 weeks (2 periods/week)	Presented in the syllabus of the subject
7.	**2015**	**Digital Microchip Design with HDL**	This subject equips students with structural principles of programmable logic device (PLD), field-programmable gate array (FPGA),	**3**	45 in-class periods in 15 weeks (3 periods/week)	Presented in the syllabus of the subject

			introduction of VHSIC hardware description language (VHDL), Verilog to design and program combinational circuits, sequential circuits, application circuits and circuit design methods.			
8.	**2015**	**Microprocessor**	This subject equips students with the contents of functional roles of microprocessors and microprocessor systems; history of generations of microprocessors, basic specifications to assess the capabilities of microprocessors; structure, roles of components in a block diagram of the 8-bit microprocessor and its operational principles; history of microcontroller development, pros and cons when using microcontrollers, internal and external structures of the 8-bit microcontroller; functions of peripheral devices such as timer/counter, interrupts, microcontroller data transfer, Assembly and C programming languages to program microcontrollers, circuits using microcontrollers.	**3**	45 in-class periods in 15 weeks (3 periods/week)	Presented in the syllabus of the subject
9.	**2014**	**Advanced Microprocessor**	This subjects equipts students with the contents of 32-bit ARM cortex microcontroller family, which possess robust structures, fully-intergrated peripherals ranging from basic to advanced. It helps students design and program application circuits using the	**2**	30 in-class periods in 15 weeks (2 periods/week)	Presented in the syllabus of the subject

			32-bit ARM microcontrollers.			
10.	**2014**	**Image Processing**	This subject aims to provide students with basics of image processing. It covers an amount of knowledge ranging from basic one about image and mathematics for digital image processing to image transformations. Image filtering, image enhancement, segmentation, and edge tracking are also parts of this subject. The last part is about the introduction of feature extraction and neural network.	**3**	45 in-class periods in 15 weeks (3 periods/week)	Presented in the syllabus of the subject
11.	**2014**	**Basis and Applications of IoTs**	Advances in energy efficiency and cost reduction have led to the rapid development and deployment of network devices and sensor/actuator systems that can connect the virtual world to the real one. The number of devices connected to the Internet have exceeded the world population and is expected to reach 50 billion devices in 2020. The platform for this connection is called the Internet of Things (IoTs). This is a compact combination of numerous technologies including wireless sensor networks, Pervasive and Ubiquitous systems, ambient intelligence (AmI), distributed context-aware systems. This subject provides students with some IoTs concepts that focus on the platforms (hardware and	**3**	45 in-class periods in 15 weeks (3 periods/week)	Presented in the syllabus of the subject

			software platforms that can be used in IoTs), M2M protocols (communication protocols for IoTs: Zigbee, Bluetooth, IEEE 802.15.4, IEEE 802.15.6, IEEE 802.15.11), and mechanisms for data and information processing.			
12.	**2015**	**Electronic Information**	This subject provides students with general knowledge of electronic information systems, basic concepts of electronic information equipment used in radio, television systems, aviation and maritime communications, etc. The subject also covers basic concepts in high-frequency circuits, signal filtering techniques, impedance matching and computing circuits in electronic information equipment, modulation techniques in the analog systems The subject equips students with adequate knowledge and skills in analyzing, designing electronic information circuits. It also enables students after graduation to deal with various jobs in the field of operation, design, construction, maintenance of analog electronic information systems.	**3**	45 in-class periods in 15 weeks (3 periods/week)	Presented in the syllabus of the subject
13.	**2015**	**Telecommunication System**	This subject provides students with principles, basic components, ways of operation, and designs in some important telecommunication systems such as TDM switching systems, Multi-Protocol Label Switching (MPLS) systems,	**3**	45 in-class periods in 15 weeks (3 periods/week)	Presented in the syllabus of the subject

			receivers/transmitters/amplifiers for optical communications, second and third generation mobile networks as well as current advanced wireless communications systems and satellite transmission systems.			
14.	**2014**	**Telecommunication System 2**	This subject provides students with principles, basic components, ways of operation, and designs in some important telecommunication systems such as PDH/SDH transmission systems, Multi-Protocol Label Switching (MPLS) systems, receivers/transmitters/amplifiers for optical communications, second and third generation mobile networks as well as current advanced wireless communications systems and satellite transmission systems.	**3**	45 in-class periods in 15 weeks (3 periods/week)	Presented in the syllabus of the subject
15.	**2017**	**Introduction to ECET (2+1)**	This course introduces the program of Electronics and Communication Engineering Technology (ECET), including ELOs, specification, structure, and content. The course also provides an exciting introduction of the electronics and communication engineering profession, including professional and ethical responsibilities, and equips soft skills necessary for undergraduate study and professional	**2+1**	60 in-class periods in 15 weeks (4 periods/week)	Presented in the syllabus of the subject

			practice.			
16.	**2015**	**Data Communication**	This subject provides students with knowledge Computer Communication Networks: network services, protocols in TCP/IP models, network devices (hubs, switches, routers, etc.) It also equips students with skills in designing LAN systems and programming for intranet work and internetwork devices. Also, it helps train students to take their work seriously, work efficiently and to willingly gain new knowledge in the field. The subject equips students with adequate knowledge and skills in computer networking. It also enables students after graduation to deal with various jobs in the field of computer networking: design, construction, maintenance of computer communication network systems.	**3**	45 in-class periods in 15 weeks (3 periods/week)	Presented in the syllabus of the subject
17.	**2016**	**C Programming Language**	This subject provides students with the basics of definitions, classifications of programming languages, how to compile and execute a program on different hardware systems. It also provides students with knowledge of data types in C, C ++ and their implementation. Also, it provides students with knowledge of control structures in C, C ++ and their applicability.	**3**	45 in-class periods in 15 weeks (3 periods/week)	Presented in the syllabus of the subject

			The subject equips students with adequate knowledge and skills in designing and executing control programs for various hardware systems.			
18.	**2017**	**Introduction To The Major (Electronics and Telecommunication Engineering Technology)**	This subject consists of 45 periods to introduce first-year students the concept of electrical engineering, to equip the future engineers with roles, responsibilities and ethnics of a typical engineer. It also provides students with basic concepts of engineering design, necessary soft skills (collaborative skills, presentation skills, etc.), which helps students choose appropriate learning methods for their study, have good ethics and attitudes so that they will have adequate knowledge and good employability after graduation.	**2+1**	60 in-class periods in 15 weeks (4 periods/week)	Presented in the syllabus of the subject
19.	**2014**	**Embedded System Design**	This subject provides students with the knowledge of embedded system design including the processes of design, implementation including hardware analysis and embedded system software. It also helps students design, implement and debug complex application software on embedded systems. Lastly, it equips students with real-time operating system for real-time embedded control systems.	3	45 in-class periods in 15 weeks (3 periods/week)	Presented in the syllabus of the subject
20.	**2014**	**Digital Integrated Circuit Design**	This subject enables students to design basic combinational logic and	3	45 in-class periods in 15 weeks (3	Presented in the syllabus of the subject

			sequential logic gates, thereby building a large-sized digital IC design system with various applications or a digital IC system. The subjects help students analyze the influences of the parasitic elements (R, I, C) on the timing and power consumption of the design, which allows students to provide optimal solutions to the design of digital ICs. It also equips students with knowledge of how to produce and implement a layout of a standard logic gate and a digital IC system.		periods/week)	
21.	**2015**	**Signals And Systems**	This subject provides students with basics of signals and systems (continuous and discrete); knowledge and skills of signal analysis; calculate the output response, frequency response of a system in the time and frequency domains.	3	45 in-class periods in 15 weeks (3 periods/week)	Presented in the syllabus of the subject
22.	**2015**	**Digital Signal Processing**	The module consists of 07 chapters. In Chapter 1, the transition from continuous time signal to discrete time signal is presented in detail from sampling theorem to signal recovery after being processed through digital signal processing system. Discrete signals, discrete systems along with analysis of their characteristics and features are presented for learners in Chapter 2. Chapter 3 deals with the applications of mathematical operations, characteristics of the signals	3	45 in-class periods in 15 weeks (3 periods/week)	Presented in the syllabus of the subject

			and systems on the time domain. Chapter 4 equips learners with knowledge of Z-transform and its applications in determining the transfer functions, pulse responses, step responses and impulse responses of the systems; moreover, it provides examinations of the stability and causality of the system based on the pole-zero plot and the construction of the generalized transfer function from the pole-zero distribution on the Z-plane. In chapters 5 and 6, signals and discrete systems are analyzed in the frequency domain through the DTFS, DTFT, DFT analyses and the Fast Fourier transform (FFT). In Chapter 7, the subject provides students with design methods for the FIR and IIR filters.			
23.	**2015**	**Electronic Circuit Design**	This subject provides students, who are from the Faculty of Electrical and Electronic Engineering, with basic to advanced knowledge of electrical components, electronic circuits and their practical applications. Its content includes: • Basics and practical designs of voltage stabilizer circuits and audio amplifier circuits. • Basics and applications of some common sensors: photoresistor, infrared, thermocouple, thermistor,	3	45 in-class periods in 15 weeks (3 periods/week)	Presented in the syllabus of the subject

			velocity, gravity, etc. • Operational principles and application of some common ICs in digital control: IC 555, Opamp (LM741, TL082, LM339, etc.), ISD2560, etc. • Some combinational systems of applications.			
24.	**2015**	**Advanced Microprocessor**	This subjects equipts students with the contents of 32-bit ARM cortex microcontroller family, which possess robust structures, fully-intergrated peripherals ranging from basic to advanced. It helps students design and program application circuits using the 32-bit ARM microcontrollers.	3	45 in-class periods in 15 weeks (3 periods/week)	Presented in the syllabus of the subject
25.	**2015**	**Embedded System**	This subject equips learners with basics of embedded systems architecture, embedded operating system principles, real-time operating systems, I/O structure and its memory, programming on embedded kits. It also provides students with adequate knowledge and skills to build and develop applications through embedded kits. In addition, this subject helps learners gain appropriate attitudes and behaviors towards the process of programming via the embedded kits.	3	45 in-class periods in 15 weeks (3 periods/week)	Presented in the syllabus of the subject
26.	**2015**	**Computer Networking and Telecommunications**	This subject provides students with knowledge Computer Communication Networks: network services, protocols in TCP/IP models, network devices	3	45 in-class periods in 15 weeks (3 periods/week)	Presented in the syllabus of the subject

			(hubs, switches, routers, etc.) It also equips students with skills in designing LAN systems and programming for intranet work and internetwork devices. Also, it helps train students to take their work seriously, work efficiently and to willingly gain new knowledge in the field. The subject equips students with adequate knowledge and skills in computer networking. It also enables students after graduation to deal with various jobs in the field of computer networking: design, construction, maintenance of computer communication network systems.			
27.	**2015**	**FPGA/ASIC Design**	This subjects helps instruct students to practice designing digital ICs using FPGA hardware's, and to use ASIC / FPGA design simulators to evaluate, test and troubleshoot the designed digital ICs.	3	45 in-class periods in 15 weeks (3 periods/week)	Presented in the syllabus of the subject