THE MINISTRY OF EDUCATION AND TRAINING

HCMC UNIVERSITY OF TECHNOLOGY AND EDUCATION

FACULTY OF ELECTRICAL AND ELECTRONICS ENGINEERING

UNDERGRADUATE PROGRAM

ENGINEER OF

BIOMEDICAL ENGINEERING

(7520212)

HCM City - 2021

THE MINISTRY OF EDUCATION AND TRAINING
HO CHI MINH CITY UNIVERSITY OF TECHNOLOGY AND EDUCATION
Faculty of electrical and electronics engineering

UNDERGRADUATE PROGRAMME
(Full-time Curriculum)

Programme: Biomedical Engineering

Level: Undergraduate

Major: Biomedical Electronics Engineering

Programme duration: 4 years

(Decision No……date… on……..)

1- Enrollment, Grading System, Curriculum and Graduation Requirements

- *Enrollment***:** High-school Graduates
- *Grading system*: 10
- *Curriculum and Graduation Requirements*: Based on regulations of Decision No 43/2007/BGDDT

2- The Goals, Objectives, and Expected Learning Outcomes

Goals

The programme is designed to prepare graduates to assume engineering and technology positions in the biomedical electronics field. Graduates of Biomedical Engineering (BME) programme have an ability to demonstrate expertise and career advancement in the biomedical electronics field through the application of fundamental knowledge, skills, and engineering technology tools. In addition, they have the ability to contribute significantly to the achievement of their organization's goals as an effective member and an ability to take part in life-long learning by being engaged with biomedical institutions, educational organizations, hospitals and professional societies.

Programme Objectives

PO-01	Apply, formulate and solve scientific, technical and technological problems in biomedical engineering field with social benefit
PO-02	Identify, develop, conduct experiments for analysis, and apply new knowledge with professional responsibility and ethics in biomedical engineering field
PO-03	Recognize and apply effectively when working in teams, and communicate effectively to people and even in English
PO-04	Operate, apply, analyze, evaluate, design and manage health and medical systems in term of considering economic, social and human factors

Expected Learning Outcomes

ELO-01	Ability to apply, formulate and solve principles, theorems, concepts of engineering, science and mathematics in the field of biomedical engineering
ELO-02	Ability to develop, conduct, and operate appropriate experiments and devices on boards, machines, and data obtained to interpret and produce results

ELO-03	Ability to recognize professional and ethical responsibilities associated with biomedical engineering issues that affect the social, environmental, economic, and global contexts
ELO-04	Ability to recognize and apply knowledge in appropriate and long-term learning strategies
ELO-05	Ability to effectively apply knowledge to teamwork and provide entrepreneurship and leadership to achieve objectives
ELO-06	Ability to explain, demonstrate, and communicate technical issues to people in the BME field and even in English
ELO-07	Ability to analyze and interpret data obtained from the experiments to apply appropriate circuits and systems
ELO-08	Ability to effectively evaluate issues, systems and applications in biomedical field that can impact on social, economic, environmental and global contexts to have conclusions
ELO-09	Ability to create biomedical engineering systems using new knowledge and skills

3- Blocks of knowledge in the whole programme: 150 credits (without Physical Education and National Defense Education knowledge)

4- Blocks of knowledge

Name	Credits		
	Total	**Compulsion**	**Elective**
General knowledge	**62**	**58**	**04**
Political Education and General Laws	13	13	0
Humanities and Social Science	04	0	04
English	12	12	0
Mathematics and Natural Sciences	27	23	0
Informatics	03	03	0
Introduction to BME	03	03	0
Professional knowledge	**88**	**79**	**09**
Biomedical and Electronics Core	30	27	3
Biomedical and Electronics Advanced Core	9	9	0
Biomedical Electronics Specialization	17	11	6
Laboratories and Practices	21	21	0
Internship and Graduation Thesis	11	11	0

5- Programme Contents

6	**General knowledge: 62 Credits**			
No.	**Course Prefix and Number**	**Course Title**	**Cr.**	**Note**
A1	**Political Education and General Laws**		**12**	

1	LLCT130105	Principles of Marxist-Leninism	3	
2	LLCT120205	Political Economics of Marxism and Leninism	2	
3	LLCT120405	Science socialism	2	
4	LLCT120314	Ho Chi Minh's Ideology	2	
5	LLCT220514	History of Vietnamese communist party	2	
6	GELA220405	General Laws	2	
A2	**Informatics**		**3**	
1	CPRL130064	Program-C Language	3	
A3	**Introduction to BME**		**3**	
1	INBE130165	Introduction to BME	3	
A4	**Foreign Language**		**12**	
1	ENGL130137	English 1	3	
2	ENGL230237	English 2	3	
3	ENGL330337	English 3	3	
4	ENGL430437	English 4	3	
A5	**Humanities and Social Science (Select 02 of free elective courses)**		**4**	
1	GEEC220105	General Economics	2	
2	QMAN331606	Quality Management	2	
3	INMA220305	Introduction to Management	2	
4	INLO220405	Introduction to Logic	2	
5	IVNC320905	Vietnamese Culture	2	
6	INSO321005	Introduction to Sociology	2	
7	ENPS220591	Engineer Psychology	2	
8	SYTH220491	Systematic thinking	2	
9	LESK120190	Learning Skills	2	
10	PLSK120290	Planning Skill	2	
11	WOPS120390	Workplace Skills	2	
12	SRME530126	Scientific Research Methodology	2	
A6	**Mathematics and Natural Sciences**		**23**	
1	MATH130101	Calculus 1	3	
2	MATH130201	Calculus 2	3	
3	MATH130301	Calculus 3	3	
4	AMEE341944	Applied Mathematics for Electrical Engineers	4	
5	MATH131901	Mathematical statistics for engineers	3	
6	PHYS130102	Physics 1	3	
7	PHYS130202	Physics 2	2+1	

8	GCHE130603	General Chemistry	3	
A7	**Physical Education**		**5**	
1	PHED110513	Physical Education 1	1	
2	PHED110613	Physical Education 2	1	
3	PHED130715	Physical Education 3	3	
A8	**National Defense Education**		**165**	
B	**Professional knowledge: 88 credits**			
No.	**Course Prefix and Number**	**Course Title**	**Cr.**	**Note**
B1	**Biomedical and Electronics Core**		**27**	
1	ELCI140144	Electric Circuits	4	
2	BAEL340662	Basic Electronics	4	
3	DIGI330163	Digital Systems	3	
4	MICR330363	Microprocessor	3	
5	BIME332265	Computer-Aided Design	3	
6	HUAN330265	Human and animal physiology and anatomy	3	
7	BISI340665	Biosignal processing	4	
8	HSBE330865	Biomedical Engineering Safety	3	
B2	**Elective Biomedical and Electronics Core (Select 01 course)**		**3**	
1	ELFI230344	Electromagnetic Field	3	
2	ITFA336064	Internet of Things: Foundations and Applications	3	
3	AIFA436864	Fundamentals and applications of AI	3	
4	APCA331363	Android programming in control applications	3	
5	SISY330164	Signals and Systems	3	
B3	**Biomedical and Electronics Advanced Core**		**9**	
1	MEDE330465	Biomedical Electronic Circuit Design	3	
2	DEMD330565	Biomedical Instrumentation	3	
3	TESO330765	Biomedical Sensor Technology	3	
B4	**Biomedical and Electronics Specialisation**		**11**	
1	IMSY332065	Healthcare Information system	3	
2	BIIM330965	Bio-medical Image Processing	3	
3	MESY335565	Embedded Systems in Biomedical Engineering	3	

4	BUCO121465	Topics with Enterprises	2	
5	LEBU320026	Leadership and Entrepreneurship in Engineering		
B5	**Elective Biomedical and Electronics Advanced Core (Select 02 courses)**		**6**	
1	APME332365	Data Acquisition and Control Using Computer	3	
2	WITE332465	Wireless Technologies	3	
3	SPSU332565	Special Topic in Biomedical Engineering	3	
4	ECME332665	Engineering Challenges in Medicine	3	
5	MALE331063	Machine Learning	3	
6	BIMA332765	Biomaterials	3	
7	BITE332865	Biomedical Imaging Technology	3	
8	BIAP332965	Application of ultrasound and magnetism in biomedicine	3	
B6	**Elective Biomedical and Electronics Advanced Core from relative programmes (Select 02 courses)**			
1	INSK331663	Industrial skills	3	
2	PLCS330846	Programmable Logic Controller	3	
3	INRO331129	Industrial Robot	3	
4	SCDA430946	SCADA Systems	3	
5	ROTE430946	Robotics Engineering	3	
6	HCIN431979	Human-Computer Interaction	3	
7	APEN331329	Applied Programming in Engineering	3	
B5	**Massive Open Online Courses (MOOCs): Select courses for replacing the courses taught at classroom**			
1	LLCT220514	History of Vietnamese communist party		
2	GELA220405	General Laws		
3	LLCT130105	Principles of Marxist-Leninism		
4	INSO321005	Introduction to Sociology		
5	PRSK320705	Representation Skills		
6	MATH130101	Calculus 1		
7	MATH130201	Calculus 2		
8	MATH130301	Calculus 3		
9	CPRL130064	Program-C Language		

10	ELCI140144	Electric Circuits		
11	BAEL340662	Basic Electronics		
12	DIGI330163	Digital Systems		
13	SISY330164	Signals and Systems		
14	MATH132901	Applied Probability-Statistic		
B8	**Laboratories and Practices**		**21**	
1	ELPR320762	Basic Electronics Lab	2	
2	PRDI310263	Digital Systems Lab	1	
3	PRMI320463	Microprocessor Lab	2	
4	PRCD312663	Digital Electronic Circuit Design Lab	1	
5	MEPR321565	Biomedical Instrumentation Lab	2	
6	MEPR316165	Biomedical Embedded Systems Engineering Lab	1	
7	BIPR311665	Biosignal Signal Processing Lab	1	
8	TSEP321765	Biomedical Electronic Circuit Lab	2	
9	BIMP311865	Biomedical Image Processing Lab	1	
10	TSEP311965	Biomedical Sensors Technology Lab	1	
11	BSPR411965	Healthcare Information Systems Lab	1	
12	ELPR311065	Digital Electronics Project	1	
13	MIPR311165	Microprocessor Project	1	
14	CAPR411265	Capstone Project	1	
15	THEM426265	Thesis Topics	3	
B9	**Internship and Thesis**		**11**	
1	GRPR442065	Internship	4	
2	GRAD462165	Graduation Thesis	7	

C Teaching plan

The general courses arranged by GAPAO each semester				
No.	**Course Prefix and Number**	**Course Title**	**Cr.**	**Pre-requisite**
1	ENGL130137	English 1	3	
2	ENGL230237	English 2	3	
3	ENGL330337	English 3	3	
4	ENGL430437	English 4	3	
5	LLCT120205	Principles of Marxist-Leninism	2	
6	LLCT120405	Science socialism	2	

7	LLCT220514	History of Vietnamese communist party	2	
8	LLCT120314	Ho Chi Minh's Ideology	2	
9	GELA220405	General Laws	2	
10	PHED110513	Physical Education 1	1	
11	PHED130715	Physical Education 3	3	
	Total		**22**	
1st Semester				
No.	**Course Prefix and Number**	**Course Title**	**Cr.**	**Pre-requisite**
1	LLCT130105	Principles of Marxist-Leninism	3	
2	CPRL130064	Program-C Language	3	
3	MATH130101	Calculus 1	3	
4	INBE130165	Introduction to BME	3	
5	PHED110513	Physical Education 2	1	
	Total		**12**	
2nd Semester				
No.	**Course Prefix and Number**	**Course Title**	**Cr.**	**Pre-requisite**
1	MATH130201	Calculus 2	3	MATH130101
2	PHYS130102	Physics 1	3	
3	AMEE341944	Applied Mathematics for Electrical Engineers	4	MATH130201
4	MATH130401	Applied Probability –Statistics	3	
5	ELCI140144	Electric Circuits	4	MATH130101
	Total		**21**	
3rd Semester				
No.	**Course Prefix and Number**	**Course Title**	**Cr.**	**Pre-requisite**
1	PHYS130202	Physics 2	3	PHYS130102
2	MATH130301	Calculus 3	3	MATH130201
3	GCHE130603	General Chemistry	3	
4	DIGI330163	Digital Systems	3	BAEL340662
5	BAEL340662	Basic Electronics	4	
6	HUAN330265	Human and animal physiology and anatomy	3	
7	PHYS111202	Physics Lab-1	1	
	Total		**18**	
4th Semester				
No.	**Course Prefix and Number**	**Course Title**	**Cr.**	**Pre-requisite**
1	BISI340665	Bio-signal processing	4	SISY330164
2	MICR330363	Microprocessor	3	DIGI330163
3	MEDE330465	Biomedical Electronic Circuit Design	3	BAEL340662
4	PRDI310263	Digital Systems Lab	1	DIGI330163
5	TESO330765	Biomedical sensor technology	3	
6	ELPR320762	Basic Electronics Lab	2	BAEL340662
7	PHYS111302	Physics Lab-2	1	
8		**Elective Biomedical and Electronics Core (Select 01 course)**	3	
	Total		**21**	

5th Semester				
No.	**Course Prefix and Number**	**Course Title**	**Cr.**	**Pre-requisite**
1	BIIM330965	Biomedical image processing	3	BISI340665
2	BIPR311665	Bio-signal signal processing Lab	1	BISI340665
3	DEMD330565	Biomedical Instrumentation	3	
4	PRMI320463	Microprocessor Lab	2	MICR330363
5	PRCD312663	Digital Electronic Circuit Design Lab	1	DIGI330163
7	TSEP321765	Biomedical Electronic Circuit Lab	2	MEDE330565
8	ELPR311065	Digital- Electronics Project	1	BAEL340662 DIGI330163
9	MESY335565	Embedded Systems in Biomedical Engineering	3	MICR330363
10	TSEP311965	Biomedical Sensors Instrumentation Lab	1	MESY335565
11		Humanities-Social Sciences (Select 02 of free elective courses)	4	
	Total		**20**	
6th Semester				
No.	**Course Prefix and Number**	**Course Title**	**Cr.**	**Pre-requisite**
1	MIPR311165	Microprocessor Project	1	PRMI320463
2	HSBE330865	Health and Safety in Biomedical Engineering	3	
3	BIMP311865	Biomedical Image Processing Lab	1	BISI340665
4	MEPR321565	Biomedical Instrumentation Lab	2	DEMD330565
5	MEPR316165	Biomedical Embedded Systems Engineering Lab	1	MESY335565
6	IMSY332065	Healthcare information system	3	INBE130165
7	BIME331965	Computer Aided Design		
8		Specialised knowledge (Select 02 of free elective courses)	6	
	Total		**17**	
7th Semester				
No.	**Course Prefix and Number**	**Course Title**	**Cr.**	**Pre-requisite**
1	CAPR411265	Capstone Project	1	
2	BSPR411965	Healthcare Information Systems Lab	1	IMSY332065
3	GRPR442065	Internship	4	MIPR311165
4	BUCO121465	Topics with Enterprises	2	
5	LEBU320026	Leadership and Entrepreneurship in Engineering	2	
6	THEM426265	Thesis Topics	3	
	Total		**17**	
8th Semester				
No.	**Course Prefix and Number**	**Course Title**	**Cr.**	**Pre-requisite**
1	GRAD462165	Graduation Thesis	7	
	Total		**7**	

A. Brief Course Description

A.1. Applied Mathematics for Electrical Engineers

Credit: 4 credits (4:0:8) (4 lecture periods, 0 lab period, 8 self-study periods per week)

Prerequisite course(s): None

Previous course(s): Advanced Mathematic 1

Course Description

The course on Applied Mathematics of Electrical Enginers provides learners knowledge related to matrices, complex numbers and functions, ordinary differential equations and laplace transforms, fourier series and optimization. They can use knowledge to analyze circuit, signal processing and automation system

---

A.2. Electric Circuits

Credits: 4 (4:0:8) (4 for theory, 0 for practice/experiment)

Prerequisite course(s): None

Previous course(s): Advanced Mathematics1,2,3

Course description

This course aims to supply learners with knowledge to solve problems related to electric circuit analysis. Learners will learn laws, principles and Maths such as Ohm's, Faraday's and Kirchoff's laws to solve problems related to electrical and electronics circuits. Moreover, learners will learn how to analyse circuits with mutual inductance, Op-Amp, three phase systems, two-ports networks, linear and nonlinear circuits in time domain and frequency domain using Laplace transform, Fourier transform and bode plot with their applications in the real world.

A.3. Fundamentals and applications of AI

3 credits (3:0:6) (3 lecture periods, 0 lab period, 6 self-study periods per week)

Prerequisite course(s): None

Previous course(s): Program-C Language

Course Description:

The AI Foundations and Applications course provides students the foundational knowledge of artificial intelligence and applications. The course is designed to include the foundational knowledge of applied math, probability theory, artificial neural networks and deep learning. In addition, the course equips skills in programming artificial intelligence applications using Python language and building recognition applications.

A.4. Android programming in control applications

Credits: 3 credits (3:0:6) (3 lecture periods, 0 lab period, 6 self-study periods per week)

Prerequisite course(s): Microprocessor

Previous course(s):

Course Description:

The course equips students with fundamental knowledge of the Android operating system and control applications. In detail, Android development tools and essential components of a control application are introduced. The user interface, the operator on an Android application are described. Moreover, the course introduces methods for event handling,

completing, and packaging in an application. Modern technologies such as SMS, Bluetooth, Wifi, NFC, voice recognition, accelerometer are also introduced in this course ... Fundamental knowledge on microcontrollers and electronic devices are integrated to develop a comprehensive application.

A.5. Basic Electronics

Credits: (4:0:8) (4 lecture periods, 0 lab period, 8 self-study periods per week)

Prerequisite course(s): None

Previous course(s): Electrical circuits

Course Description:

The course on Basic Electronics provides leaners with basic knowledge about materials for electronic components such as structures, characteristics and applications of basic electronic components (Diode, Transistor, SCR, TRIAC, DIAC, OP-AMP and 4-layer semiconductor devices, optoelectronic components). Methods of analyze, calculate parameters and design basic electronic circuits are included in this course, such as rectifier, clipper, DC power, small signal amplifier, power amplifier, oscillator, control circuits using SCR, TRAC, DIAC, photoresistor, op-to and electronic circuits applied in practice.

A.6. Biomaterials

Credits: 3 credits (3:0:6) (3 lecture periods, 0 lab period, 6 self-study periods per week)

Prerequisite course(s): None

Previous course(s): Advanced Mathematics

Course Description:

This course aims to provide learners the basic knowledge of material science and its application properties in biomedical field. The course includes the knowledge such as structure, mechanical properties, and biocompatibility. Students can learn the methods of analysis, testing and evaluation of material standards. Finally, there are practical applications in the biomedical field, the prospects and challenges of biomedical materials in medicine.

A.7. Topics with Enterprises

Credits: 2 credits (2:0:4) (2 lecture periods, 0 lab period, 4 self-study periods per week)

Prerequisite course(s): None

Previous course(s): None

Course Description:

This subject provides students knowledge of situations that often occur in the industrial environment and how to approach and solve problems that can occur in practice. Therefore, students can study knoledge and skills to quickly integrate in the industrial environment after graduation. In addition, the course will teach students about the way and engineer career, how to analyse failure and success, process data and experiences during working.

A.8. Capstone Project

Credits: 1 credits (1:0:2) (1 lecture periods, 0 lab period, 2 self-study periods per week)

Prerequisite course(s): None

Previous course(s): Digital Electronic project; Biomedical Instrumentation Lab

Course Description:

After completing this subject, students will be able to form ideas for implementing graduation thesis. In addition, this subject aims to help students implement these ideas to work out the graduation thesis, to work in a team with members and defense it in a thesis committee. Students must submit reports with chapters, in which there are calculation, design, choice of components and then send to lecturers.

A.9. C programming language

Credits: 3 credits (3:0:8) (3 lecture periods, 0 lab period, 6 self-study periods per week)

Prerequisite course(s): None

Previous course(s): None

Course Description:

The course covers the fundamental concepts of programming language: definition, classification, and purpose of different languages. The course specifically focuses on C programming language, demonstrates data structures and control structures in the C language. The course help students to get knowledge and ability of designing and writing C language applications.

A.10. Electromagnetic Field

Credits: 3 credits (3:0:6) (3 lecture periods, 0 lab period, 6 self-study periods per week)

Prerequisite course(s): None

Previous course(s): Advanced Mathematics, General Physics

Course Description:

This course provides learners fundamental knowledge related to electromagnetic field, laws and equations for describing electromagnetic field. In addition, the course also equips with the knowledge of the static electromagnetic field, steady electromagnetic field, time-varying electromagnetic field, electromagnetic waves, electromagnetic radiation; calculate the characteristic parameters of electric field, magnetic field and electromagnetic waves.

9.11. Engineering Challenges in Medicine

Credits: 3 credits (3:0:6) (3 lecture periods, 0 lab period, 6 self-study periods per week)

Prerequisite course(s): None

Previous course(s): Human and Animal Physiology and Anatomy

Course Description:

This course is designed for students to study advanced techniques in biomedical engineering. Lecturers with medical and engineering majors and experiences in multidisciplinary research, will teach the subject. The course includes topics about the central nervous system, muscles and bones, lungs and heart. In the course, important biosignals, measurement methods, necessary equipment along with sicientific research topics will be discussed.

A.12. Electronics In Practice

Credits: 2 credits (0/2/4) (0 lecture periods, 2 lab period, 4 self-study periods per week)

Prerequisite course(s): Basic Electronics

Previous course(s): Electrical Circuit

Course Description:

The course on Electronics in Practice guides learners to practice on basic electronic circuits such as rectifier, clipper, DC supply power, small signal amplifier, power amplifier, switching circuit using transistor, sine and square waveform oscillator circuits, control circuit using SCR, TRIAC, DIAC, photoresistor, OPTO and practical electronic circuits.

A.13. Thesis

Credits: 3 credits (7:0:14) (7 lecture periods, 0 lab period, 14 self-study periods per week)

Prerequisite course(s): All courses

Previous course(s): None

Course Description:

This thesis course requires learner to carry out a practical research project that can be a real model applied new knowledge and the learned knowledge to calculate, design, construct and estimate it. In addition, this course helps students to complete the synthesis of documents, to represent a complete report and the real model and the thesis committee will assess contribution to working group, skills of designing, writing report and other contributions related to scientific research skills and creativity.

A.14. Internship

Credits: 4 credits (0:4:8) (0 lecture periods, 4 lab period, 8 self-study periods per week)

Prerequisite course(s): None

Previous course(s): Courses of projects and Labs

Course Description:

The course trains students to have the qualities of a biomedical engineering engineer. Students are introduced to practise at domestic and foreign companies, health care units, hospitals, and medical centers in order to consolidate studied knowledge and practise good manners under the instruction of the company or hospital for internship.

A.15. Industrial Skills

Credits: 3 credits (3:0:6) (3 lecture periods, 0 lab period, 6 self-study periods per week)

Prerequisite course(s): None

Previous course(s): None

Course Description:

This subject provides students with knowledge of situations that often occur in the industrial environment and how to approach and solve problems. Therefore, students should form skills to quickly integrate in the industrial environment after graduation. In particular, the course will teach students about the way and career of an engineer, analysis in failure and success, as well as ways to handle data and working experiences.

A.16. Internet of Things: Foundations and Applications

Credits: 3 credits (3:0:8) (3 lecture periods, 0 lab period, 6 self-study periods per week)

Prerequisite course(s): None

Previous course(s): Embedded Systems

Course Description:

The main aim of this course is to introduce the fundamental concepts of the Internet of Things and its applications and architecture models; the technologies and mechanisms for sensing, actuation, processing and cyber-physical data communication; Discussing semantic technologies, service oriented solutions and networking technologies that enable the integration of IoTs data and services into the cyber world.

A.17. Machine learning

Credits: 3 credits (3:0:6) (3 lecture periods, 0 lab period, 6 self-study periods per week)

Prerequisite course(s): C Programming Language

Previous course(s): Probability and Applied Statistic

Course Description:

This course on Machine Learning is intended to provide learners with the fundamental knowledge of machine learning algorithms and practical applications in the Python language. The algorithms include supervised learning, unsupervised learning, and recommendation systems. In addition, techniques for model evaluation and model selection are also presented. Sklearn library and Python language are introduced to implement these machine-learning algorithms.

A.18. Biomedical Electronic Circuit Design

Credits: 3 credits (3:0:6) (3 lecture periods, 0 lab period, 6 self-study periods per week)

Prerequisite course(s): None

Previous course(s): Basic Electronics, Digital Systems

Course Description:

The course on biomedical electronic circuit design provides learners with knowledge related to the design of electronic circuits based on the knowledge of electronic circuits used in biomedical engineering systems. In particular, biomedical signal amplification circuits using Op-Amp circuits, biomedical signal filtering circuits (low-pass, high-pass, band-pass, blocking-pass filter circuits), measuring circuits connected to biomedical sensors such as electrocardiogram, electroencephalogram, electromyogram.

A.19. Microprocessor

Credits: 3 credits (3:0:8) (3 lecture periods, 0 lab period, 6 self-study periods per week)

Prerequisite course(s): Digital Systems, Basic Electronics

Previous course(s): Digital Systems

Course Description:

This course equips learners with the functional knowledge of microprocessors and their history. In detail, the course covers the infrastructure and operating principles of an 8-bit microcontroller. Peripheral devices such as timer/counter, analog-to-digital conversion, interrupts, pulse width modulation, UART data transmission are also introduced. Assembly language and C language are used to implement microcontrollers-based applications. The co-design between hardware and software is introduced.

A.20. Microproceesor Project

Credits: 1 credits (0:1:1) (0 lecture periods, 1 lab period, 2 self-study periods per week)

Prerequisite course(s): Digital-Electronics Project

Previous course(s): Microprocessor; Microprocessor Lab

Course Description:

Students will investigate previuos research works using knowelege of electronics, digital, and microprocessors to calculate, design and impletment of biomedical circuits and systems. In addition, students must prepare reports which show contents of calculation and component selection, design, and results from simulation to real model. Students must also show presenting skills and contribution in group.

A.21. Programmable Logic Controller

Credits: 3 credits (3:0:6) (3 lecture periods, 0 lab period, 6 self-study periods per week)

Prerequisite course(s): None

Previous course(s): Electrical Machines; Digital Systems

Course Description:

The course on Programmable Logic Controller provides learners knowledge related to sensors, actuators, hardware architecture and programmable logic controller (PLC) operation. In addition, the course also introduces programming languages along with PLC instruction and control diagram design methods. Finally, students are equipped with practical skills and knowledge to design hardware and programming industrial control systems.

A.22. Electronics-Digital Project

Credits: 1 credits (0:1:1) (0 lecture periods, 1 lab period, 2 self-study periods per week)

Prerequisite course(s): None

Previous course(s): Basic Electronics Lab; Digital Systems Lab

Course Description:

Students will be required to read previous projects and use knowledge of electronics and digital systems to calculate, design, test and construct or simulate real circuits or systems. In addition, students must complete a report which show contents of calculation and selection of components, design, and results obtained from simulation and real model. Students also perform presentation skills and send reports to lecturers for assessing.

A.23. Robotics

Credits: 3 credits (3/0/6) (3 lecture periods, 0 lab period, 6 self-study periods per week)

Prerequisite course(s): Advanced Mathematics, Basic Programming.

Previous course(s): Advanced Mathematics

Course Description:

This course provides students knowledge of serial robotic systems including description of position and orientation of objects in 3D space, and transformation methods for multiple frames, computation of forward and inverse kinematics. In addition, basic computational methods of velocities and static forces for the robots will be provided to student for

supporting advanced tasks of simulation and real-time control. This course also introduces some dedicated softwares for design, simulation, and evaluation of the robotic systems.

A.24. Practice Microprocessor

Credits: 2 credits (0:2:4) (0 lecture periods, 2 lab period, 4 self-study periods per week)

Prerequisite course(s): Microprocessor

Previous course(s): Microprocessor

Course Description:

This subject equips learners with practical programming exercises using microcontrollers. The activities focus on controlling single-led, 7-segment LEDs via the direct method or the scanning method. Other devices such as LCD, GLCD, or led matrix are also is described. The exercises get inputs from buttons, matrix keyboard, digital sensors, analog sensors to control operator. Communication with other sensors via I2C devices, real-time clock, serial EEPROM memory, ADC/DAC are advantages exercises in this course. Moreover, counter-based applications such as external-pulse counting and timer applications are mentioned in detail. Stepper motor and DC motors are introduced with pulse width modulation (PWM).

A.25. SCADA systems

Credits: 3 credits (3:0:6) (3 lecture periods, 0 lab period, 6 self-study periods per week)

Prerequisite course(s): None

Previous course(s): Programmable Logic Controller; Electrical Circuit; Digital Systems.

Course Description:

The course on SCADA Systems provides learners knowledge related to the structure, classification and application of the Supervisory Control And Data Acquisition System (SCADA). Operation principle of data acquisition block, industrial communication network, data storage, control, monitoring and alerting functions of SCADA system.

In addition, students are introduced to specific software for design SCADA systems

---

A.26. Signals and Systems

Credits: 3 credits (3:0:8) (3 lecture periods, 0 lab period, 6 self-study periods per week)

Prerequisite course(s): None

Previous course(s): Calculus 1

Course Description:

This course provides fundamental knowledge and application about the continuous time signals and systems and applications. Topics include communication, continuous -time LTI signals and systems, difference equations, The Laplace Transform and convolution to Continuous-Time System Analysis, Continuous Time Fourier Series(CTFS), Continuous Time Fourier Transform (CTFT), modulation and demodulation system classification and filter system.

A.27. Special Topic in Biomedical Engineering

Credits: 3 credits (3:0:6) (3 lecture periods, 0 lab period, 6 self-study periods per week)

Prerequisite course(s): None

Previous course(s): Microprocessor, Biomedical Signal Processing, Biomedical Image Processing, Health Information Systems

Course Description:

This course aims to provide learners with basic knowledge about machines and experiments, software applied in biomedical engineering, as well as understanding medical devices in general. Therefore, students will study skills for build and design of effective and practical experiment models. In addition, special topics will provide skills to find reliable international articles, as well as how to write quality scientific articles.

A.28 Data Acquisition and Control Using Computer

Credits: 3 credits (3:0:6) (3-hour lecture and 6 hours of self-study per week)
Pre-requisite Course(s): None
Previous Course(s): None

Course Description:

This course teaches students about the types, structure, and applications of data acquisition and control systems. It introduces learners to the practical principles of signal and data processing blocks and programming techniques to collect data in reality. Moreover, students will learn about Open Platform Communications (OPC) and Supervisory Control and Data Acquisition (SCADA) systems, including their components and functions within the system.

A.29. Application of Ultrasound and Magnetism in Biomedicine

Credits: 2 credits (3:0:8) (2 lecture periods, 0 lab period, 4 self-study periods per week)

Prerequisite course(s): None

Previous course(s): None

Course Description:

The course on the application of ultrasound and magnetism in biomedicine provides learners with essential information and an overview of some advanced instrumental uses of ultrasound and magnetism in engineering and biology. The content is divided into two sections: ultrasound applications (including the interaction of ultrasound with the matter, sonochemistry, non-destructive materials diagnosis, and the use of high-power ultrasound in treatment) and magnetic applications (including the basics of magnetism and magnetic materials, magnetic sensors, nanomagnetic medical applications, and biomagnetic fields).

A.30. Biomedical Imaging Technology

Credits: 3 credits (3:0:6) (3-hour lecture and6 hours of self-study per week)

Prerequisite course(s): None

Previous course(s): None

Course Description:

The course on Biomedical imaging technology provides learners with fundamental information and an overview of the structure, operating principles, and operating principles of standard medical imaging equipment. This basic information and overviews offer students a foundation for more in-depth study in the field of design, installation, operation, and maintenance of standard diagnostic imaging equipment in the medical system.

A.31. Computer Aided Design

Credits: 3 credits (3:0:6) (3-hour lecture and 6 hours of self-study per week)
Pre-requisite Course(s): None

Previous Course(s): None

Course Descriptions:

This course introduces the learners to the use of CAD software for product design simulation and modeling. The course provides the learners with the knowledge and the ability to use CAD software proficiently. After completing this course, students will be able to design and model structural components of machinery and devices and assemble the components to create functional devices on a computer. Students can then proceed with constructing these device models by creating engineering drawings and blueprints using CAD software.

A.32. Biomedical Image Processing Lab

Credits: 1 credits (0:1:2) (0 lecture periods, 1 lab period, 2 self-study periods per week)

Prerequisite course(s): Biomedical Image Processing

Previous course(s): Signals and Systems; Biosignal Processing

Course Description:

Based on the knowledge learned in Biomedical Image Processing, the student can simulate biomedical image processing processes on Matlab or Python software and aim to perform on real image processing systems.

A.33. Health and Safety in Biomedical Engineering

Credits: 3 credits (3:0:6) (3-hour lecture and 6 hours of self-study/week)
Pre-requisite Course(s): None
Previous Course(s): None

Course Descriptions:

This course introduces learners to safety concerns in the biomedical and engineering industries. It equips students with the precaution to identify and resolve safety problems while protecting themselves, others, and medical equipment from sources of hazards during machinery operation and maintenance. These hazards can also include radiation, toxic chemicals, and dangerous biochemicals. Moreover, the course further helps learners understand the safety standards related to biomedical devices.

A.34. Biosignal Processing Laboratory

Credits: 1 credits (0:1:2) (5-hour lab session and 10 hours of self-study per week)
Pre-requisite Course(s): Biomedical Signal Processing
Previous Course(s): None

Course Descriptions:

This course allows students to practice with different biomedical signal and data acquisition methods, methods of signal preprocessing, and statistical analysis of the data. Students will work with various biomedical signals, including ECG, EEG, fNIRS, etc. Moreover, the course also teaches students to use MATLAB software to perform signal processing tasks.

A.35. Biomedical Image Processing

Credits: 3 credits (3:0:6) (3-hour lecture and 6 hours of self-study per week)
Prerequisite course(s): C Programming Language

Previous course(s): Signals and Systems; Biosignal Processing

Course Description:

The course on Biomedical Image Processing provides students with basic knowledge of computational and programming methods in biomedical image processing. The course covers the types of biomedical images such as CT, MRI, PET, and ultrasound images. The course examines common methods for enhancing and extracting useful information in medical images. In addition, some diagnostic contexts of diseases from X-ray images are used as examples for the methods mentioned.

A.36. Biosignal Processing

Credits: 4 credits (4:0:8) (4-hour lecture and 8 hours of self-study per week)
Pre-requisite Course(s): None
Previous Course(s): Signals and Systems

Course Descriptions:

This course provides students with the basics of human biostatistics and hypothesis testing. Furthermore, learners are provided with knowledge related to the collection and processing of electrocardiogram (ECG), electroencephalogram (EEG) and fNIRS signals. In addition, the course also provides learners with knowledge related to building noise filtering applications, processing of received biological signals, theoretical basis and algorithms implemented on Matlab software.

A.37. Healthcare Information Systems Lab

Credits: 1 credits (0:1:2) (5-hour lab session and 10 hours of self-study per week)
Prerequisite course(s): Healthcare Information Systems
Previous course(s): Biomedical Embedded Systems; Digital system, Microprocessor

Course Description:

This course provides students with the knowledge and skills to use software and hardware to practice computer-based health information systems (HIS). Students are taught to design electronic medical record systems; collect, store and manage all kinds of medical information.

A.38. Biomedical Instrumentation

Credits: 3 credits (3:0:6) (3-hour lecture and 6 hours of self-study per week)
Pre-requisite Course(s): Basic Electronics
Previous Course(s): Electrical Circuits, Digital

Course Descriptions:

This course provides learners with basic knowledge about the principles of medical device design, medical device safety, classification of bioelectrodes, types of biosignals, biomedical signal amplification circuits and sensors commonly used in medical equipment. Knowing how to use methods to measure blood flow, volume, respiratory system, and sound. The course also equips basic knowledge about medical devices such as: Blood pressure monitor, Ultrasound machine, EGG, EEG, MRI, Electromyography, X-ray, Blood glucose measurement.

A.39. Digital Systems

Credits: 3 credits (3:0:6) (3-hour lecture and 6 hours of self-study per week)

Pre-requisite Course(s): Basic Electronics
Previous Course(s): Basic Electronics; Circuit Theory

Course Descriptions:
This course provides students with the knowledge of digital systems, the fundamental theories of Boolean algebra, the structures and operations of essential elements in digital circuits, the structure of digital ICs, computational methods, and the design of sequential and combinational logic circuits. In addition, the course also provides students with operating principles and methods of calculating and designing digital oscillator and timing circuits, memory structure and the principle of analog-to-digital converters, methods of using memory, and analog-to-digital converters in the digital system. Course Learning Outcomes (CLOs)

A.40. Human and Animal Physiology and Anatomy

Credits: 3 credits (3:0:6) (3-hour lecture and 6 hours of self-study per week)
Pre-requisite Course(s): None
Previous Course(s): None

Course Descriptions:

The field of physiology includes the scientific study of the functions and mechanisms in living systems. As a sub-discipline of biology, physiology focuses on how organisms, organ systems, individual organs, cells, and biomolecules perform chemical and physical functions within a living system. According to the classes of organisms, the field can be divided into medical physiology, animal physiology, plant physiology, cell physiology, and comparative physiology.
The subject of human and animal physiology will focus on providing students with knowledge of the functional structure of organs in the human body. Students will understand the physiological systems, including the immune, cardiovascular, nervous, epidermal, muscular, respiratory, endocrine, and digestive systems. At the same time, the subject introduces more knowledge about many diseases and medical devices to diagnose and treat those diseases related to the above organs. Students learn the fundamental theories of structure, function, operating principle of medical devices related to human and animal physiological systems as above.

A.41. Healthcare Information System

Credits: 4 credits (3:0:6) (3-hour lecture and 6 hours of self-study per week)
Pre-requisite Course(s): None
Previous Course(s): None

Course Descriptions:

Knowledge of healthcare information systems used in healthcare system applications, the development trends of systems serving the development of healthcare, the process of building and operating a medical information system.

A.42. Introduction to Biomedical Engineering

Credits: 3 credits (2:1:4) (4-hour lecture, 1-hour lab session and 4 hours of self-study/week)
Pre-requisite Course(s): None
Previous Course(s): None

Course Descriptions:

This course introduces first-year undergraduates to the field of biomedical engineering. It equips learners with a broad range of technical knowledge in biomedical technology and introduces them to the roles of biomedical engineers, their ethical and professional responsibilities. The course also prepares learners with essential soft skills such as collaboration, communication, and presentation skills. It also equips students with the right tools and study methods to advance their working capabilities and future performance. Furthermore, students will learn and participate in activities to structure and manage a research project. These activities can help them manage their team, their work, and schedule to complete any project efficiently on time. Throughout this course, students will be exposed to various types of problems and scenarios to learn how to put knowledge into practice.

A.43. Biomedical Embedded Systems Engineering Lab

Credits: 1 credits (0:1:2) (5-hour lab session and 10 hours of self-study per week)

Prerequisite course(s): Biomedical Embedded Systems

Previous course(s): None

Course Description:

This course teaches students to program embedded and real-time operating systems. In addition, students are taught how to integrate hardware with software. Students will learn how to collect and analyze data from biomedical sensors and build an embedded biomedical system in practice.

A.43. Biomedical Instrumentation Lab

Credits: 2 credits (0:2:4) (2-hour lab session and 4 hours of self-study per week)
Pre-requisite Course(s): Biomedical Instrumentation
Previous Course(s): Fundamental Electronics

Course Descriptions:

This course provides learners with knowledge about the structures and working principles of medical devices. It guides them on the operation of medical devices for patient examination, monitoring, and prognosis in healthcare. Some devices include newborn incubators, electrotherapy devices, ultrasound for therapy and diagnostic applications, sphygmomanometer, electrocardiogram, patient monitor, endoscope, etc. Students will learn how to measure parameters directly on the human body and analyze measurement or simulation results with proven real-world results.

A.44. Embedded Systems in Biomedical Engineering

Credits: 3 credits (3:0:6) (3-hour lecture session and 6 hours of self-study per week)
Prerequisite course(s): Digital Systems
Previous course(s): Basic Electronics; Microprocessor

Course Description:

The Embedded Systems in Biomedical Engineering course provides students with the knowledge needed to build embedded systems used in medical devices for diagnosis, prognosis, patient management, and telemedicine. In addition, students will learn how to combine hardware and software in an embedded system for application in medical device

manufacturing. Furthermore, students are taught designing, programming, simulating, testing, and evaluating a biomedical embedded systems.

A.45. Digital Electronic Circuit Design Lab

Credits: 1 credits (0:1:2) (5-hour lab session and 10 hours of self-study per week)
Pre-requisite Course(s): Digital Practice
Previous Course(s): None

Course Descriptions:

This course provides learners with advanced practice in using devices and advanced practice in digital electronic application circuits such as Counters, Adders and Comparators, Combinational Logic, Shift Registers, Memory, DAC, ADC, ... In addition, students can also build a specific application product on digital circuits, know how to work in groups, read datasheets in English, write weekly reports.

A.46. Digital Systems Design Practice

Credits: 1 credits (0:1:2) (5-hour lab session and 10 hours of self-study per week)
Pre-requisite Course(s): Digital systems
Previous Course(s): Basic Electronics; Practice Basic Electronics

Course Descriptions:

This course guides students to practice assembling digital electronic circuits such as logic gates, Flip-Flop, counters, registers, combinational and sequential circuit design, memory, analog-digital conversion, and application circuits in reality.

A.47. Biomedical Sensor Technology

Credits: 3 credits (3:0:6) (15-hour lecture and 6 hours of self-study per week)
Pre-requisite Course(s): Basic Electronics
Previous Course(s): Digital Systems

Course Descriptions:

This course introduces students to the knowledge of biomedical sensor technology, from theory and working principles to these sensors' applications. In addition, this course also deals with measurement techniques, sensor signal processing, and sensing systems in medical equipment.

9.46. Biomedical Sensors Instrumentation Lab

Credits: 1 credits (0:1:2) (5-hour lab session and 10 hours of self-study/week)
Pre-requisite Course(s): Biomedical Sensor Technology
Previous Course(s): None

Course Descriptions:

The course introduces the students to the practice and experimental studies of a wide range of biomedical sensors. Each experiment is self-contained, and the student will present the findings in written form through a lab report which will have a set of experiment-specific questions to answer. This written report also forms the basis for the assessment. All students work in groups and carry out multiple experiments, which vary based on the sensors used.

A.47. Biomedical Electronic Circuit Lab

Credits: 2 credits (0:2:4) (5-hour lab session and 10 hours of self-study per week)
Pre-requisite Course(s): Biomedical Electronic Circuit Design
Previous Course(s): None

Course Descriptions:

This course guides learners to practice electronic circuits used in biomedicine, including biomedical signal amplifier circuits using Op-amp algorithm amplifier circuits, biomedical signal filter circuits low-pass, high-pass, wide-band filter circuits, etc., measurement circuits that communicate with biomedical sensors such as electrocardiogram and electromyography signals.

A.48. Wireless Technology

Credits: 4 credits (3:0:6) (3-hour lecture and 6 hours of self-study per week)
Pre-requisite Course(s): None
Previous Course(s): Basic Electronics, Digital

Course Descriptions:

This course provides students with an understanding of common wireless technologies, including Wifi, Bluetooth, Zigbee, NFC, RFID and can expand to introduce other wireless technologies that have applications in the field of medical devices. Students also learn the basics of radio communications such as frequency bands, modulation techniques, and multiple access techniques. In each wireless technology, security issues and the application of that technology are also introduced. Students also have the opportunity to learn about the integration of wireless technologies into medical device design and applications in biomedical electronics.

A.49. Thesis Topics

Credits: 3 credits (0:1:1) (0 lecture periods, 1 lab period, 3 self-study periods per week)

Prerequisite course(s): None

Previous course(s): all Labs and projects

Course Description:

Students will explore prior research using knowledge of electronics, digital systems and microprocessors to calculate, program, and operate a complete systems. Furthermore, students must complete report sections of topics to present understanding, analysis, and evaluation. Students also show presentation skills and teamwork for assessment.

A.50. General Chemistry

Credits: 3 credits (3:0:6) (3 lecture periods, 0 lab period, 6 self-study periods per week)

Prerequisite course(s): None

Previous course(s): None

Course Description:

This course is designed to provide students with the basic knowledge of chemistry, the ability to read scientific and technical literature to gain the necessary understandings

about the physical world around and to perceive the presence of chemistry in engineering majors.

This course helps students understand the nature of atoms and molecules, thereby explaining the properties of matter. In addition, this course also helps students develop the ability to solve fundamental quantitative problems related to thermodynamics, reaction kinetics, stoichiometry, solution properties and electrochemical processes.

A.51. General law

Credits: 2 credits (2:0:4) (2 lecture periods, 0 lab period, 4 self-study periods per week)

Prerequisite course(s): None

Previous course(s): None

Course Description:

This course is designed to provide students with the basic knowledge about the general theory of State and Law including origin, form, function, the system of State; nature, functions, source, the form of law… The course also consists of basic knowledge of the Vietnamese legal system and some basic regulations of some laws like Criminal law, Civil law, Labour law, marriage and family law...

A.52. Mathematical Statistics for Engineers

Credit: 03 credits (3/0/6) (3 theory credits, 0 practice credit).

Time allocation: 15 weeks (3 theory credits + 0*0 practice credit + 6 self-study credits / week)

Prerequisite course(s): None
Previous courses: Calculus 2 or Mathematical Economics 1

Course Description:
This course is designed to cover topics from mathematical statistics that are of interest to students from engineering and/or the sciences. Topics should include descriptive statistics, elementary probability, random variables and distributions, mean variance, parameter estimation, hypothesis testing and time permitting- correlation, regression and analysis of variance.

A.53. Calculus 1

Credits: 3 credits (3:0:6) (3 lecture periods, 0 lab period, 6 self-study periods per week)
Prerequisite course(s): None
Previous course(s): None

Course Description:
This course is designed to provide students with the basics of limit, continuity, differentiation and integration of one variable functions.

A.54. Mathematical Economics 1

Credit:03 credits **(3/0/6)** (3 theory credits, 0 practice credit).
Prerequisite course(s): None
Previous course(s): None

Course Description:
Mathematical Economics 1 course provides the basic knowledge of matrix, determinant, linear equation system, vector space R^n, quadratic form, differentiation of functions of one variable and many variables. This course also provides some applications in economics.

A.55. Calculus 3

Credits: 3 credits (3:0:6) (3 lecture periods, 0 lab period, 6 self-study periods per week)
Prerequisite course(s): None
Previous course(s): Calculus 1, Calculus 2

Course Description:
This course equips students with the basic knowledge about vector-value functions, functions of several variables, partial derivatives, double and triple integrals, line and surface integrals, and vector calculus. Students also learn how to apply this knowledge to solve problems in physical science and other practical use cases.

A.56. Calculus 2

Credits: 3 credits (3:0:6) (3 lecture periods, 0 lab period, 6 self-study periods per week)
Prerequisite course(s): Calculus 1
Previous course(s): Calculus 1

Course Description:
This course is designed to provide students with the basic knowledge of the integration of functions of a variable, of infinite series, of power series, and of vectors in the plane and in space.

9.57. Physics 1

Credits: 3 credits (3:0:6) (3 lecture periods, 0 lab period, 6 self-study periods per week)
Prerequisite course(s): Mathematics 1
Previous course(s): None

Course Description:
This course is designed to provide students with the fundamental physics including mechanics and thermodynamics as a basic *knowledge* for approaching major college subjects of study in science, engineering and technology.

Our students will be trained with the physical knowledge in order to interpret the movement, the energy and the other physical phenomena related to objects in the nature with a size from molecular to planet. After this course, they can apply the studied knowledge in scientific research as well as in engineering development and advanced technology.

The goal of this subject helps our students to be familiar with the scientific methods, the fundamental laws of physics, interpretation of scientific knowledge in general physics and logical reasoning skills as well as strategies in preparation for learning major subjects according to the bachelor program for engineers. In order to achieve this goal, this course will focus on the combination between an understanding of the concepts and necessary skills for solving many different forms of standard problems (homework) at the end of each chapter.

Besides that, this course will also help our students to understand how to build mathematical models based on experimental results and know how to analyze, to write, to present as well as to develop a specific model based on the recorded data. They can use this model to predict the results of other experiments. Simultaneously, they will know limits of the model and can use it in the prediction.

9.58. Physics 2

Credits: 3 credits (3:0:6) (3 lecture periods, 0 lab period, 6 self-study periods per week)
Prerequisite course: Mathematics 1, Mathematics 2, Physics 1, Physics - Laboratory 1

Previous course(s): none

Course Description:
This course is designed to provide students with the basic knowledge of physics including electricity, magnetism, light and optics, which is compulsory to access specialized courses in science, engineering and technology branches.
Students will be equipped with the knowledge of phenomena in the natural world, and can apply the knowledge in scientific research, and in technical and technological developments.

The goal of this module is to help students become familiar with the scientific method, the fundamental laws of physics, improve their scientific knowledge of physics in general, reasoning skills, as well as strategies to prepare for learning in specialized science classes in programs for engineers. To achieve this goal, the module will provide both understandings of the concepts and skills of solving standard problems (homework) at the end of each chapter.

Besides, this module will help students understand how to build a mathematical model based on experimental results, how to record, display, analyze data and develop a model based on the data which can be used to predict the results of other experiments. At the same time, students will know the limits of the model and can use them in the prediction only, they will know limits of the model and can use it in the prediction.

A.59. Mathematical Statistics for Engineers

Credit: 03 credits (3/0/6) (3 theory credits, 0 practice credit).
Prerequisite course(s): none
Previous courses: Calculus 2 or Mathematical Economics 1

Course Description:
This course is designed to cover topics from mathematical statistics that are of interest to students from engineering and/or the sciences. Topics should include descriptive statistics, elementary probability, random variables and distributions, mean variance, parameter estimation, hypothesis testing and time permitting- correlation, regression and analysis of variance.