

PEOPLE'S COMMITTEE OF HO CHI MINH CITY
LY TU TRONG COLLEGE OF HO CHI MINH CITY

TRAINING PROGRAM OF COLLEGE LEVEL

COURSE TITLE: INDUSTRIAL ELECTRICITY

Ho Chi Minh City – 2020



TRAINING PROGRAM

Name of business: Industrial Electricity

Code of business: 6580227

Education level: College

Forms of training: Regular (Credit)

Enrollment objects: Graduated from high school or equivalent with a pass in Mathematics and preferably Physics (or studied engineering subjects)

Training time: 2.5 years

1. Training objective

1.1. General objective:

- Having basic knowledge about the basic principles of Marxism - Leninism; revolutionary methods of the Communist Party of Vietnam; Ho Chi Minh Ideas; law.
- Having basic knowledge about social sciences and humanities suitable for the trained majors.
- Having basic knowledge about natural sciences, meeting the reception of professional education knowledge and ability to study at a higher level.

1.2. Detail goal:

a. Knowledge:

- Presenting standards to ensure labor safety, electrical safety for people and equipment;
- Presenting structure, operating principles and application of electrical equipment, electric tools;
- Presenting the methods of measuring circuit parameters and basic circuit quantities;
- Stating concepts, laws and basic theorems of DC, AC and three-phase AC circuits;
- Analysis of conventional symbols on electrical drawings;
- Describe the structure and working principle of the electric machine;
- Presenting the methods of calculating the parameters, winding the completion of the small power transformer as required;
- Analyzing diagrams of electrical system principles of machine-tools such as lathes, milling machines, drilling machines and production machines such as conveyors, cranes, elevators, electric furnaces ...;
- Analyzing the principles of the sensors;
- Presenting the principles of the power transmission system;
- Identification of electromechanical devices of electrical drive systems;
- Presenting principles and methods of speed control of electrical drive systems;
- Presenting structure, symbols and application of passive components;
- Presenting structure, symbols, application of semiconductor components, ways of connecting components in the circuit, how to determine specifications of components



- Presenting the structure of some simple electronic circuits applying electronic components and their operating principles;
- Presenting the structure and operation principles of power electronic components;
- Demonstrating procedures of maintenance and replacement of power electronic components meeting technical standards;
- Presenting the structure and operating principle of PLC programming control system of different brands;
- Presenting the structure and working principles of SCADA (Supervision Control And Data Acquisition) systems in industry;
- Analyzing all kinds of design and installation drawings of electric systems;
- Present basic knowledge about politics, culture, society, law, national defense and security, physical education according to regulations.

b. Skill:

- Reading convention symbols on electrical drawings;
- Calculate the parameters, wrap the wire to complete the small capacity transformer as required;
- Proficient installation of systems to protect safety in industry and civil;
- Implementing the work of occupational safety, industrial cleaning and providing first aid to people with electric shock properly;
- Identify and classify electrical tools and basic electrical equipment;
- Selectability of basic electrical tools and electrical equipment;
- Disassembly of electrical tools;
- Measure circuit parameters and basic quantities;
- Calculate technical parameters in DC, AC and three-phase circuits in established and transient state;
- Draw and analyze the stator winding diagram of single-phase, three-phase induction motors;
- Calculate and rewind damaged single-phase and three-phase motors according to available data;
- Calculate parameters, wind the completed wire of small capacity transformers as required;
- Install, operate, maintain, and repair electric machines as required;
- Disassembly and repair of electrical tools in accordance with the manufacturer's specifications;
- Installed lighting system for households according to design drawings;
- Installation and repair of starting and stopping machines circuit for 3-phase, 1-phase motors and DC motors;
- Assembling and repairing electrical circuits for metal-cutting machines such as electric circuits for drilling machines, lathes, milling, grinding ... and production machines such as cranes, elevators, electric furnaces ...;
- Calculate and select the conductor, arrange the electrical system suitable for working conditions, use purposes in a building, workshop or factory;
- Install a power supply line for a building, workshop in accordance with requirements and standards;
- Calculate and select a suitable electrical motor for an adjustable and non-adjustable electrical drive system;
- Identify the components on the actual and electrical circuit diagram. Draw and analyze basic circuit diagrams applying electronic components;
- Proficient in measuring equipment to measure and check electronic components, electrical circuit components, electrical circuit parameters;
- Proficient welding and disassembly of electronic circuits;
- Checking the quality of power electronic components in maintenance and replacement of basic power electronic components;
- Proficient connection of PLC with PC and with peripheral devices;
- Writing programs for different types of PLCs meeting technical requirements;



- Can operate the circuit according to the principle and the specified process;
- Establish a reasonable maintenance plan to ensure industrial safety and industrial cleaning;
- Designing SCADA applications in industrial control systems;
- Programming and control over industrial control systems;
- Removing and installing sensors and components or elements in the automation system, replacing and modifying elements;
- Use basic information technology as prescribed; to exploit, process and apply information technology to professional works of the profession;
- Can use basic foreign languages, reach level 2/6 in the Framework of Foreign Language Proficiency of Vietnam; applying foreign languages to professional works of the profession.

c. The degree of autonomy and responsibility:

- Comply, seriously conduct learning and research, learn the working environment to improve professional knowledge, skills in organizing professional activities, to meet requirements in the process. industrialization and modernization of the country;
- Having enough health, strong mentality, agile and flexible working style to work in extreme outdoor weather conditions, on high power transmission poles to ensure labor safety, as well as have enough self-confidence and discipline to work in foreign businesses;
- Work independently in changing working conditions, with individual and team responsibilities;
- Responsible for evaluating the quality of work after completion and performance results of themselves and members of the group before the leaders of agencies and organizations;
- Have a sense of learning and practicing to improve professional qualifications and professional skills.

1.3. Job positions after graduation:

After graduation, students are capable of meeting the requirements of the job positions of the profession, including:

- Installation of electrical system for works;
- Operation and maintenance of electrical system for works;
- Installing and operating the power supply system;
- Maintenance of the power supply system;
- Installation of electrical cabinets;
- Repair, maintenance and operation of electric machines;
- Install renewable energy power system;
- Operation, maintenance and maintenance of renewable energy power systems;
- Installation of machine-tools circuits;
- Repair and maintenance of machine-tool circuits;
- Trading in electrical equipment.

1.4 Ability to learn, improve qualifications

- The minimum amount of knowledge, the competency requirements that the learner must achieve after graduating college degree from the Industrial Electrical profession, can continue to develop at higher levels;
- Graduates have the ability to self-study and self-update scientific and technological advances within the scope of specialization or profession to improve their qualifications or study continuously to a higher level in the same profession or group of professions or in the same field of training.



2. Volume of knowledge and course duration:

- Number of subjects: **47**
- Volume of knowledge and skills for the entire course: **100** credits
- Volume of general subjects: **525** sessions
- Volume of professional subjects: **2030** sessions
- Theoretical volume: **603** sessions; exercise, practice, and experiment: **1891** sessions
- Course duration: **2.5** years

3. Content Training Program:

Subject Code	Subject Title	Study Time (45 minutes per session)				
		Credits	Total number of Sessions	Theory	Practice - Internship - Experiment - Exercise - Discussion	Test
I	Subject of underlying sciences	30	525	240	255	30
CTC304	Political Education	4(3,1,7)	75	41	29	5
CTC305	Law Major	2(2,0,4)	30	18	10	2
CBC305	Physical Education (*)	2(0,2,1)	60	5	51	4
CBC307	Security and Defense Education (*)	4(3,1,7)	75	36	35	4
TTC301	Information Technology	4(1,3,4)	75	15	58	2
CBC301	English Language 1	3(1,2,3)	40	14	24	2
CBC302	English Language 2	3(1,2,3)	40	14	24	2
CBC303	English Language 3	2(1,1,3)	40	14	24	2
CBC304	English Language 4	2(2,0,4)	30	28		2
KTC301	Personal and Professional Skills and Attributes (*)	4(4,0,8)	60	55		5
II	Advanced Engineering Fundamental Subjects	70	2030	363	1636	31
II.1	Core Engineering Fundamental Subjects	18	392	85	298	9
Compulsory Subjects		18	392	85	298	9
DDC3153	Earthing and Earth Fault Current Protection (replaced with CoGC curriculum)	2(1,1,3)	31	10	19	2
DDC331	Electric Circuits	2(2,0,4)	30	28		2
DDC383	Ecology and Environment	2(2,0,4)	30	9		1
DDC305	Basic Electronics	2(2,0,4)	30	28		2



DDC3148	Electrical Testing and Measurement (replaced with CoGC curriculum)	2(1,1,3)	31	10	19	2
DDC308	Practice of Basic Electrics	2(0,2,1)	60		60	
DDC306	Practice of Basic Electronics	2(0,2,1)	60		60	
DDC304	Practice of Digital Systems	2(0,2,1)	60		60	
DDC316	Practice of Automation Measurements and Smart Sensors	2(0,2,1)	60		60	
Elective Subjects		0	0	0	0	0
II.2	Advanced Engineering Fundamental Subjects	52	1638	278	1338	22
Compulsory Subjects		44	1458	222	1218	18
DDC3147	Single and Three Phase Induction Motors (replaced with CoGC curriculum)	2(1,1,3)	31	13	16	2
DDC315	Electrical Instruments	2(2,0,4)	30	28		2
DDC3154	Fundamental Electrical Systems (replaced with CoGC curriculum)	2(1,1,3)	31	13	16	2
DDC3155	Inspection and Testing of Electrical Installations (replaced with CoGC curriculum)	2(1,1,3)	31	13	16	2
DDC367	Calculating and Repairing Electrical Machines	2(2,0,4)	30	28		2
DDC314	Power Electronics	2(2,0,4)	30	28		2
DDC312	Basic Circuit Diagrams	2(2,0,4)	30	28		2
DDC319	Advanced Circuit Diagrams	3(3,0,6)	45	43		2
DDC372	Building Management Systems	2(2,0,4)	30	28		2
DDC317	Practice of CAD in Electric and Electronic Engineering	2(0,2,1)	60		60	
DDC327	Practice of Power Supplying Systems (**)	2(0,2,1)	60		60	
DDC320	Practice of Electrical Machines	2(0,2,1)	60		60	
DDC313	Practice of Basic Circuit Diagrams	2(0,2,1)	60		60	
DDC323	Practice of Advanced Circuit Diagrams (**)	2(0,2,1)	60		60	
DDC311	Practice of Programmable Logic Controller (**)	2(0,2,1)	60		60	
DDC324	Specialized Projects 1	1(0,1,0)	45		45	
DDC325	Specialized Projects 2	1(0,1,0)	45		45	
DDC380	Graduation Thesis	5(0,5,0)	225		225	
DDC326	Graduation Internship (**)	6(0,6,0)	270		270	
DDC3110	Internship in Business (**)	5(0,5,0)	225		225	



Elective subjects (4 of 8 subjects selected) 2 theory. 2 practical modules		8	180	56	120	4
DDC328	Practice of SCADA (**)	2(0,2,1)			60	
DDC373	Practice of SmartHome (**)	2(0,2,1)			60	
DDC345	Practice of Automation Technology Process	2(0,2,1)			60	
DDC334	Practice of Object-Oriented Programming	2(0,2,1)			60	
DDC329	Lighting Engineering	2(2,0,4)	30	28		2
DDC330	Electrical drives and Applications	2(2,0,4)	30	28		2
DDC333	Renewable Energy	2(2,0,4)	30	28		2
DDC344	Automation Technology Process	2(2,0,4)	30	28		2
Total		100	2555	603	1891	61

4. Training Plan:

No	Subject Code	Subject Title	Number of Credit	Subject Code: Study first (a) Study in parallel (b)	Notes
Semester 1			18		
Compulsory subjects			18		
1	CBC307	Security and Defense Education (*)	4(3,1,7)		
2	CTC304	Political Education	4(3,1,7)		
3	CBC305	Physical Education (*)	2(0,2,1)		
4	KTC301	Personal and Professional Skills and Attributes (*)	4(4,0,8)		
5	DDC3153	Earthing and Earth Fault Current Protection (replaced with CoGC curriculum)	2(1,1,3)		
6	DDC331	Electric Circuits	2(2,0,4)		
Elective subjects			0		
Semester 2			21		
Compulsory subjects			21		
1	CBC301	English Language 1	3(1,2,3)		
2	TTC301	Information Technology	4(1,3,4)		
4	DDC383	Ecology and Environment	2(2,0,4)		
5	DDC305	Basic Electronics	2(2,0,4)	DDC331 (a)	



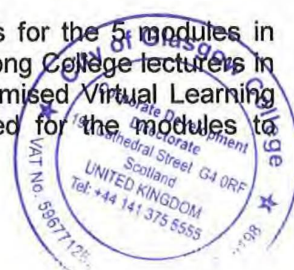
No	Subject Code	Subject Title	Number of Credit	Subject Code: Study first (a) Study in parallel (b)	Notes
6	DDC3148	Electrical Testing and Measurement (replaced with CoGC curriculum)	2(1,1,3)	DDC3153 (a)	
7	DDC308	Practice of Basic Electrics	2(0,2,1)	DDC3153 (a)	
8	DDC3147	Single and Three Phase Induction Motors (replaced with CoGC curriculum)	2(1,1,3)	DDC331 (a)	
9	DDC315	Electrical Instruments	2(2,0,4)	DDC3147 (a)	
10	DDC3154	Fundamental Electrical Systems (replaced with CoGC curriculum)	2(1,1,3)	DDC331 (a)	
Elective subjects			0		
Semester 3			22		
Compulsory subjects			20		
1	CBC302	English Language 2	3(1,2,3)		
2	CTC305	Law Major	2(2,0,4)		
3	DDC306	Practice of Basic Electronics	2(0,2,1)	DDC305 (a)	
4	DDC3155	Inspection and Testing of Electrical Installations (replaced with CoGC curriculum)	2(1,1,3)	DDC3154 (a)	
5	DDC367	Calculating and Repairing Electric Machines	2(2,0,4)	DDC3147 (a)	
6	DDC327	Practice of Power Supplying System (**)	2(0,2,1)	DDC3154 (a)	
7	DDC312	Basic Circuit Diagrams	2(2,0,4)	DDC3147 (a)	
8	DDC320	Practice of Electrical Machines	2(0,2,1)	DDC367 (a)	
9	DDC317	Practice of CAD in Electric and Electronic Engineering	2(0,2,1)	DDC308 (a)	
10	DDC324	Specialized Projects 1	1(0,1,0)		
Elective subjects 1 (1 of 2 subjects selected)			2		
1	DDC329	Lighting Engineering	2(2,0,4)	DDC3154 (a)	
2	DDC333	Renewable Energy	2(2,0,4)		
Semester 4			20		
Compulsory subjects			18		
1	CBC303	English Language 3	2(1,1,3)		
2	DDC316	Practice of Automation Measurements and Smart Sensors	2(0,2,1)	DDC306 (a)	
3	DDC314	Power Electronics	2(2,0,4)	DDC305 (a)	



No	Subject Code	Subject Title	Number of Credit	Subject Code: Study first (a) Study in parallel (b)	Notes
4	DDC372	Building Management Systems	2(2,0,4)		
5	DDC313	Practice of Basic Circuit Diagrams	2(0,2,1)	DDC312 (a)	
6	DDC311	Practice of PLC (**)	2(0,2,1)	DDC312 (a)	
7	DDC319	Advanced Circuit Diagrams	3(3,0,6)	DDC312 (a)	
8	DDC325	Specialized Projects 2	1(0,1,0)	DDC324 (a)	
9	DDC304	Practice of Digital Systems	2(0,2,1)	DDC306 (a)	
Elective subjects 2 (1 of 2 subjects selected)			2		
1	DDC373	Practice of SmartHome (**)	2(0,2,1)	DDC308 (a)	
2	DDC334	Practice of Object-Oriented Programming	2(0,2,1)		
Semester 5			19		
Compulsory subjects			15		
1	CBC304	English Language 4	2(2,0,4)		
2	DDC323	Practice of Advanced Circuit Diagrams (**)	2(0,2,1)	DDC319 (a)	
3	DDC380	Graduation Thesis	5(0,5,0)	DDC325 (a)	
4	DDC326	Graduation Internship (**)	6(0,6,0)		
5	DDC3110	Internship in Business (**)	5(0,5,0)		
Elective subjects 3 (1 of 2 subjects selected)			2		
1	DDC330	Electrical drives and Applications	2(2,0,4)	DDC3147 (a)	
2	DDC344	Automation Technology Process	2(2,0,4)	DDC311 (a)	
Elective subjects 4 (1 of 2 subjects selected)			2		
1	DDC328	Practice of SCADA (**)	2(0,2,1)	DDC311 (a)	
2	DDC345	Practice of Automation Technology Process	2(0,2,1)	DDC344(a)	
Total			100		

Note:

City of Glasgow College will supply all course and assessment materials for the 5 modules in English. Each module has 31 sessions and it will be delivered by Ly Tu Trong College lecturers in Vietnamese. In addition, City of Glasgow College will provide their customised Virtual Learning Environment (MyCity) and E-library resources to those students enrolled for the modules to support their study.



5. Instructions for using the program

5.1. Guidelines for determining content and time for extracurricular activities

- In order for students to have full awareness of the profession they are studying, the school arranges for students to visit some production and business establishments suitable to the training profession;
- Time for extracurricular activities is arranged outside of the formal training time at an appropriate time.

5.2. Instructions to test the end of the subject

Comply with the Regulation on organizing the implementation of training programs at intermediate level and college level by mode of credit accumulation; Regulations on test, examination and graduation recognition at Ly Tu Trong College of Ho Chi Minh City, issued together with Decision No. 713 / QD-LTT-DT dated July 19, 2017 of the Rector of Ly Tu Trong College of Ho Chi Minh City is amended and supplemented some articles according to Decision No. 696 / QD-LTT-DT dated June 26, 2019 by the Rector of Ly Tu Trong College of Ho Chi Minh City.

5.3. Graduation accreditation review guide:

Graduation recognition consideration shall comply with the Regulation on organizing the implementation of training programs at intermediate level and college level according to the mode of credit accumulation; Regulations on test, examination and graduation recognition at Ly Tu Trong College of Ho Chi Minh City, issued together with Decision No. 713 / QD-LTT-DT dated July 19, 2017 of the Rector of Ly Tu Trong College of Ho Chi Minh City is amended and supplemented some articles according to Decision No. 696 / QD-LTT-DT dated June 26, 2019 by the Rector of Ly Tu Trong College of Ho Chi Minh City.

Based on the proposal of the Graduation Examination Council, the Rector signs the decision to recognize the graduation and issue the diploma of the College for students who are eligible to graduate.

5.4. Other notes

Subjects Physical Education, Security and Defense Education, Personal and Professional Skills & Attributes and Internship in Enterprises are not included in the general academic grade, but are prerequisites to consider completing the learning volume, graduation exam event and graduation recognition.

The Enterprises Internship course is not included in the total number of credits in the program. Depending on the expertise of each profession, the Dean (of faculty) can choose one of the following forms to perform:

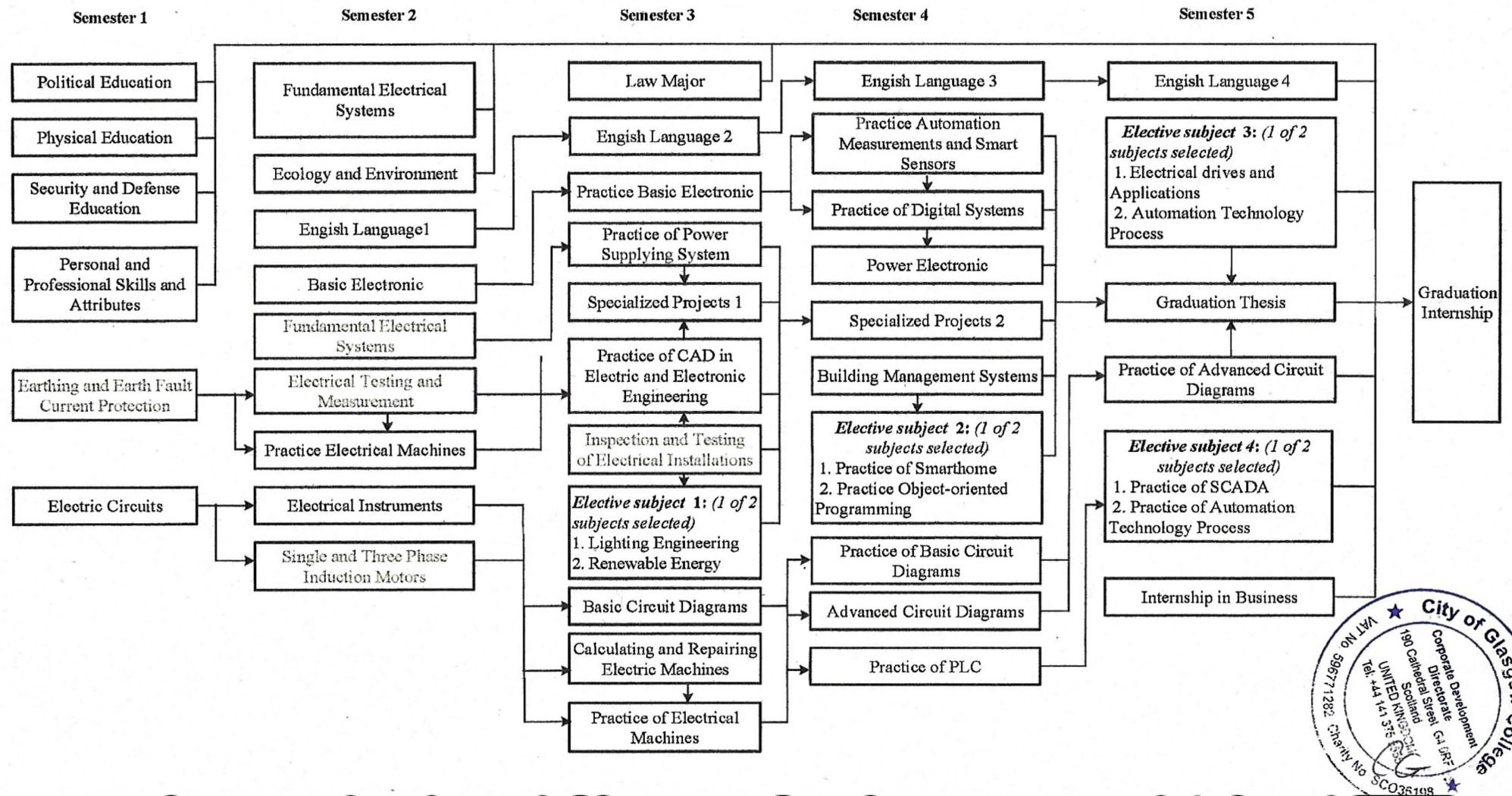
- Internship in Enterprises.
- Internship at specialized workshops or Affiliated Business Centers located at Ly Tu Trong College of Ho Chi Minh City.
- Join specialized clubs in the faculty.
- Implement models and projects deployed by the faculty.
- The subjects marked with (**) will be trained at the Enterprise.



TRAINING PROGRAM CHART

Name of business: Industrial electricity

Code of business: 6580227



BRIEF DESCRIPTION OF CITY OF GLASGOW COLLEGE SUBJECTS:

Earthing and Earth Fault Current Protection

This Module is intended for Learners with little or no prior knowledge of earthing systems for electrical installations, and the protection of persons against the dangers of earth fault currents. The aim of this Module is to develop the Learner's knowledge and understanding of the various types of earthing system and the requirements of the Wiring Regulations BS7671 in relation to earthing and earth fault current protection. The Module will introduce Learners to different methods of fault protection and to the types of earthing arrangement outlined in BS7671. Learners will be able to select appropriate sizes of earth protective conductors, bonding conductors and a circuit protective device for given installation conditions. Learners will also be introduced to Residual Current Devices (RCD) as a means of disconnecting the supply in the event of a fault to earth.

Fundamental Electrical Systems

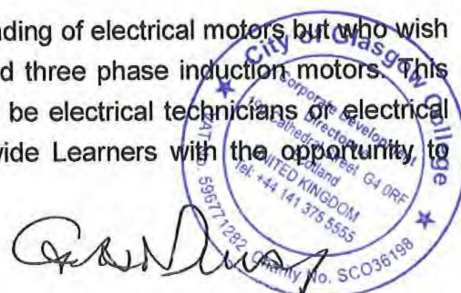
Designed for learners with little or no prior knowledge of electrical systems but who wish to gain knowledge of such systems. Learners may be school leavers or adults wishing to gain an insight into the fundamentals of electrical systems or wishing to pursue a course/career in electrical power engineering. The aim of this Module is to develop Learner's knowledge and understanding of electrical generation, transmission and distribution systems from the generating station to the point of control and protection within the consumer's installation. On successful completion of this Module Learners will be able to describe the operating principles and constructional features of High Voltage (HV) generators and the component parts of an electrical transmission system. They will also be able to describe both ring and radial distribution systems and the basic control and protection requirements of these systems. The methods of isolation, control, protection and earthing of Low Voltage (LV) electrical installations are also developed.

Electrical Testing and Measurement

Designed for Learners with little or no prior knowledge of electrical testing and measurement but who wish to develop knowledge and skills in this important area of electrical engineering. The Module is particularly suitable for those Learners training to be electrical technicians. On successful completion of this Module Learners should be able to use electrical test equipment to make correct and safe measurements in electrical circuits and installations. Learners will also gain knowledge and understanding of the principles of operation of a moving coil instrument, electrodynamic wattmeter and kWhr meter

Single and Three-Phase Induction Motors

Designed for Learners with a basic knowledge and understanding of electrical motors but who wish to enhance their knowledge and understanding of single and three phase induction motors. This Module is particularly suitable for those Learners training to be electrical technicians or electrical maintenance personnel. The aim of this Module is to provide Learners with the opportunity to



develop their knowledge and understanding of universal motors, single and three phase induction motors. Learners will also learn about three phase induction motor starting methods.

Inspection and Testing of Electrical Installations

This practically-based Module is suitable for Learners with little or no prior knowledge of inspection and testing of electrical installations but who wish to gain an understanding of how such measures are carried out to provide an assurance that electrical systems are fit for purpose and comply with the appropriate regulations. The aim of this Module is to raise Learner awareness of the need to inspect and test new electrical installations and/or additions and alterations in order to ensure that the work undertaken and the materials used meet industry recognised standards. The Learner will study the requirements of the Wiring Regulations BS7671 in relation to inspection and testing and able to distinguish between these as set out in the Regulations. On successful completion of this Module Learners will recognise the different forms of documentation and reports provided in BS7671 and will carry out inspection and testing procedures and complete the appropriate documentation.

