Courses of the specialization Industrial Electronics (IE)			
Trimester	Unit	Code	CTH per week
1	Basic Physics I	PHY115	3
	Technical Mathematics I	MAT113a	3
	Computer Applications I	ICT 101	2
2	Basic Physics II	PHY116	3
	Technical Mathematics II	MAT113b	3
	Computer Applications II	ICT 102	2
3	Specialized Physics for EET	PHY116b	3
	Specialized Mathematics for EET	MAT115	3
	Computer Applications III	ICT 103.	2
4	Technical Communication	244 ELC	3
	DC – Circuits	163 ELC	5
	Electrical Installation	144 ELC	10
	Instrumentation and Measurement I	267 ELC	2
	Digital Circuits I	167 ELC	3
5	AC – Circuits	161 ELC	5
	Instrumentation and Measurements II	227 ELC	2
	Digital Circuits II	127 ELC	2
	Electronic Circuits I	166 ELC	4
	Electronics Workshop I	145 ELC	6
	Programmable Logic Controllers I	248 ELC	4
6	Electronic Circuits II	260 ELC	5
	Electronics Workshop II	245 ELC	4
	Control Systems I: Introduction	262 ELC	6
	Microprocessors I	251 ELC	5
	Programmable Logic Controllers II	248b ELC	3
7	Electronics Circuits III: Power Electronics	261 ELC	5
	Electronics Workshop III: Troubleshooting	246 ELC	4
	Control Systems II: Analysis	263 ELC	5
	Microprocessors II	251b ELC	3
	Graduation Project	252 ELC	6
8	Co-operative Training	299ELC	4

Department	Electrical/Electronic Technology		Specialization	Industrial Electronics
Course Name	General Mathematics I		Course Code CAT	MAT 113a
Module			Credit hours	
Trimester	1st		Course Code TVTC	
Weekly Contact Hours	L	3	Prerequisites	None
	P			
	T			
Course Description				

This unit centres on the basic concepts of mathematics which enables the trainee to cope with all relevant physical content during the coming 3 trimesters. Moreover this course serves as an effective preparation for the following technical disciplines, where the use of mathematical concepts and skills in a variety of contexts is obligatory.

Therefore the course emphasizes exploring, understanding, and utilizing mathematical concepts in order to comprehend physical phenomena and technical applications quantitatively.

Trainees study in depth mensuration, simple equations, transposition of formulae, concept of functions, and introduction of vectors as a representation of forces.

Department	Electrical/Electronic Technology		Specialization	Industrial Electronics
Course Name	General Mathematics II		Course Code CAT	MAT 113b
Module			Credit hours	
Trimester	2nd		Course Code TVTC	
Weekly Contact Hours	L	3	Prerequisites	MAT 113a
	P			
	T			

Course Description

This unit centres on the basic concepts of mathematics which enables the trainee to cope with all relevant physical content during the coming 2 trimesters. Moreover this course serves as an effective preparation for the following technical disciplines, where the use of mathematical concepts and skills in a variety of contexts is obligatory.

Therefore the course emphasizes exploring, understanding, and utilizing mathematical concepts in order to comprehend physical phenomena and technical applications quantitatively.

Trainees study in depth the concept of functions and vectors as a continuation of the first trimester. Furthermore this trimester includes the topics exponential and logarithmic function and simultaneous equations.

Each mathematics topic is closely linked with the content of physics to point out the necessity of using mathematics to gain a deep understanding of physical phenomena.

Department	Electrical/Electronic Technology		Specialization	Industrial Electronics
Course Name	Specialized Mathematics EIT		Course Code CAT	MAT 115
Module			Credit hours	
Trimester	3rd		Course Code TVTC	MAT115
Weekly Contact Hours	L	3	Prerequisites	MAT 113b
	P			
	T			

Course Description

This unit is centred on the basic concepts of mathematics which enables the trainee to cope with all relevant content of physics during the 3rd trimester. Moreover this course serves as an effective preparation for the following technical disciplines, where the use of mathematical concepts and skills in a variety of contexts and applications is obligatory. Therefore the course emphasizes exploring, understanding, and utilizing mathematical concepts in order to comprehend physical phenomena and technical applications quantitatively. Trainees study in depth the concept of trigonometric functions and complex numbers. Furthermore this unit includes the topic of basic mathematics for pc applications (Number Systems and Boolean Algebra). Each mathematics topic is closely linked with the content of physics to point out the necessity of using mathematics to gain a deep understanding of physical phenomena.

Department	Electrical/Electronic Technology		Specialization	Industrial Electronics
Course Name	General Physics I		Course Code CAT	PHY 115
Module			Credit hours	
Trimester	1st		Course Code TVTC	PHY115
Weekly Contact Hours	L	3	Prerequisites	
	P			
	T			
Course Description				

This unit centres on the basic laws of physics and emphasizes a conceptual understanding of the natural world with a focus on basic mechanical and electrical phenomena using elementary mathematics as necessary. Laboratory experiments and the study of basic mathematics facilitate a fundamental understanding of the concepts needed to explore the world from a scientific point of view. Trainees will be introduced to the following topics: measurement, kinematics, dynamics, work, energy, electrostatics, the generation of voltage, Ohm's Law and magnetic fields and forces. The course also emphasizes exploring and understanding physical phenomena linked to technical applications both qualitatively and quantitatively together with supporting lab work. Moreover this course serves as an effective preparation for other subsequent technical disciplines. Each topic is designed as an integrated learning topic which covers the content of physics as well as a certain mathematics topic. Both topics are closely linked together in order to emphasize the necessity of using mathematics to gain a deep understanding of physical phenomena.

Department	Electrical/Electronic Technology		Specialization	Industrial Electronics
Course Name	General Physics II		Course Code CAT	PHY 116
Module			Credit hours	
Trimester	2nd		Course Code TVTC	PHY116
Weekly Contact Hours	L	3	Prerequisites	PHY115
	P			
	T			

Course Description

This unit centres on the basic laws of physics and emphasizes a conceptual understanding of the natural world with a focus on basic mechanical and electrical phenomena using elementary mathematics as necessary. Laboratory experiments and the study of basic mathematics facilitate a fundamental understanding of the concepts needed to explore the world from a scientific point of view. Trainees will be introduced to the following topics: measurement, kinematics, dynamics, work, energy, electrostatics, the generation of voltage, Ohm's Law and magnetic fields and forces. The course also emphasizes exploring and understanding physical phenomena linked to technical applications both qualitatively and quantitatively together with supporting lab work. Moreover this course serves as an effective preparation for other subsequent technical disciplines. Each topic is designed as an integrated learning topic which covers the content of physics as well as a certain mathematics topic. Both topics are closely linked together in order to emphasize the necessity of using mathematics to gain a deep understanding of physical phenomena.

Department	Electrical/Electronic Technology		Specialization	Industrial Electronics
Course Name	Specialized Physics EET		Course Code CAT	PHY 116b
Module			Credit hours	
Trimester	3rd		Course Code TVTC	PHY116
Weekly Contact Hours	L	3	Prerequisites	PHY116
	P			
	T			

Course Description

This unit is cantered on the basic laws of physics and emphasizes a conceptual understanding of the natural world with a focus on basic electrical phenomena using elementary mathematics as necessary. Laboratory experiments and the study of basic mathematics facilitate a fundamental understanding of the concepts needed to explore the world from a scientific point of view. Trainees study in depth AC Circuits and Electromagnetic Waves, including basic lighting technology. The course also emphasizes exploring and understanding physical phenomena linked to technical applications both qualitatively and quantitatively together with supporting lab work. Moreover this course serves as an effective preparation for the following technical disciplines.

Department	Electrical/Electronic Technology		Specialization	Industrial Electronics
Course Name	Technical Communication		Course Code CAT	244ELC
Module			Credit hours	3
Trimester	4th		Course Code TVTC	244ELC
Weekly Contact Hours	L	1	Prerequisites	Math-III Physics-III
	P	2		
	T	-		

Course Description

Engineering drawings give you information. This information will show you how to manufacture, assemble and maintain components, sub-assemblies and technical installations. As a Technician, you will need to be able to read and use different types of engineering drawings. Engineering drawings are the universal language of industry. There are standard symbols, conventions and terms which allow a trained person to understand and use a drawing done by someone else.

Drawings can be used and understood anywhere in the world. A skilled worker in Japan can build equipment from drawings supplied by an engineer in UK, even if they do not speak the same language.

This course will make you understand and show, how to use different types of technical documents commonly used in electrical engineering.

Department	Electrical/Electronic Technology		Specialization	Industrial Electronics
Course Name	DC-Circuits		Course Code CAT	163ELC
Module			Credit hours	5
Trimester	4th		Course Code TVTC	163ELC
Weekly Contact Hours	L	2	Prerequisites	Math-III Physics-III
	P	3		
	T	-		

Course Description

Students of all engineering backgrounds need to understand basic electrical principles. It forms part of an essential foundation to nearly all engineering courses. Electric circuits, which are collections of circuit elements connected together, which are the most fundamental structures of electrical engineering.

This course describes the nature of electrical current and describes all consisting components of the simple electrical circuit. It explains the relation between voltage source, current flow and conductor resistance, which are influenced by external physical properties. It will cover the phenomena of magnetism and their effects on electrical conductors. It investigates on the phenomenon of mutual influence between magnetic fields and electrical conductors being in the vicinity to each other.

Department	Electrical/Electronic Technology		Specialization	Industrial Electronics
Course Name	Electrical Installations		Course Code CAT	144ELC
Module			Credit hours	5
Trimester	4th		Course Code TVTC	144ELC
Weekly Contact Hours	L		Prerequisites	Math-III Physics-III)
	P	8		
	T	-		

Course Description

Industries must be promoted to aim at high productivity as well as excellent quality of their products to meet international standards. This consequently results in requirements for a high level of technology and manpower qualification. As modern plants are complex systems with mechanical, electrical, electronically and computerized components on a high technical level, there must be specialists in all these fields to run these plants. The technicians must have a wide range of qualifications within their field of specialization. Installation, maintenance and repair of electrical and electro-mechanical equipment, therefore an excellent trained Technician is required.

On the basis of his vocational training, the Electrical Technician in this specialised subject area of operations technology is qualified to perform work assignments in the area of electrical engineering. Their tasks involve setting up, extending and modifying, commissioning and maintaining of power plants, Industrial Electronics and control systems, electrical transformers, motors, generators and related control and protective system. These tasks are performed independently mainly in production plants and operational equipment while observing the relevant safety regulations, using technical documents and instructions.

This practical course prepares the trainees to use mechanical tools to wire-up light and signaling circuits according to technical standards and given technical documents in particularly lay-out plan, wiring diagrams and given instructions, applying important national/international safety standards and regulations, taking into considerations environmental protection issues and the efficient use of electrical energy.

Department	Electrical/Electronic Technology		Specialization	Industrial Electronics
Course Name	Instrumentation& Measurements I		Course Code CAT	267ELC
Module			Credit hours	1
Trimester	4th		Course Code TVTC	267ELC
Weekly Contact Hours	L	1	Prerequisites	Math-III Physics-III
	P	1		
	T	-		

Course Description

Electrical measurements are the methods, devices and calculations used to measure electrical quantities. Measurement of electrical quantities may be done by measure electrical parameters of a system. Using transducers, physical properties such as temperature, pressure, flow, force, and many others can be converted into electrical signals, which can then be conveniently measured and recorded. High-precision laboratory measurements of electrical quantities are used in experiments to determine fundamental physical properties such as the charge of the electron or the speed of light, and in the definition of the units for electrical measurements, with precision in some cases on the order of a few parts per million. Less precise measurements are required every day in industrial practice. Electrical measurements are a branch of the science of metrology. Metrology is the science of measurement. Metrology includes all theoretical and practical aspects of measurement.

In this practical course the trainee acquires knowledge in how to use electrical measuring devices in a safe and professional manner. It provides the trainees with the basic knowledge required to use electrical measuring instruments. This is done by teaching the theoretical component and executing the necessary experiments in the laboratory. Furthermore it enables the trainees to understand and evaluate measuring results of electrical values taken.

Department	Electrical/Electronic Technology		Specialization	Industrial Electronics
Course Name	Digital Circuits		Course Code CAT	167ELC
Module			Credit hours	3
Trimester	4th		Course Code TVTC	NEW COURSE
Weekly Contact Hours	L	1	Prerequisites	Math-III Physics-III
	P	2		
	T	-		

Course Description

Digital electronics are electronics systems that use digital signals. Digital electronics are representations of Boolean algebra and are used in computers, mobile phones, and other consumer products. In a digital circuit, a signal is represented in discrete states or logic levels. The advantages of digital techniques stem from the fact it is easier to get an electronic device to switch into one of a number of known states, than to accurately reproduce a continuous range of values, traditionally only two states, '1' and '0' are used though digital systems are not limited to this. Digital electronics or any digital circuit is usually made from large assemblies of logic gates, simple electronic representations of Boolean logic functions.

Digital circuits are electric circuits based on a number of discrete voltage levels. To most engineers, the terms "digital circuit", "digital system" and "logic" are interchangeable in the context of digital circuits. Computers, electronic clocks, and programmable logic controllers (used to control industrial processes) are constructed of digital circuits.

This course will give the trainee a basic knowledge on how the basic digital gates/circuits are functioning and how digital signals are being processed.

Department	Electrical/Electronic Technology		Specialization	Industrial Electronics
Course Name	AC-Circuits		Course Code CAT	161ELC
Module			Credit hours	3
Trimester	5th		Course Code TVTC	161ELC
Weekly Contact Hours	L	2	Prerequisites	163ELC
	P	2 (Total hours 52)		
	T	-		

Course Description

Electric power is generated, distributed, and used as sinusoidal voltages and currents in a great variety of commercial and domestic applications. Furthermore, in the industrial world a vast number of small-, medium-, or large-size AC power generators and loads are interlinked. Therefore, the design, operation, maintenance, and management of such systems very much depend on a good understanding of AC circuit theory.

The analysis of AC circuits involves the study of the behavior of the system under both normal and abnormal operating conditions. However, this course is not intended to include abnormal conditions. Instead, it focuses on the foremost fundamental issues and normal conditions. Additionally, it is assumed that a steady-state sinusoidal condition is reached, which means that all transient effects in AC circuits have disappeared.

These topics are of practical importance in AC systems. The fundamental terminologies used in AC circuits are introduced, considering both single-phase and three-phase AC circuits.

Department	Electrical/Electronic Technology		Specialization	Industrial Electronics
Course Name	Instrumentation& Measurements II		Course Code CAT	227ELC
Module			Credit hours	1
Trimester	5th		Course Code TVTC	227ELC
Weekly Contact Hours	L	1	Prerequisites	267ELC
	P	1		
	T	-		

Course Description

Electrical measurements are the methods, devices and calculations used to measure electrical quantities. Measurement of electrical quantities may be done by measure electrical parameters of a system. Using transducers, physical properties such as temperature, pressure, flow, force, and many others can be converted into electrical signals, which can then be conveniently measured and recorded. High-precision laboratory measurements of electrical quantities are used in experiments to determine fundamental physical properties such as the charge of the electron or the speed of light, and in the definition of the units for electrical measurements, with precision in some cases on the order of a few parts per million. Less precise measurements are required every day in industrial practice. Electrical measurements are a branch of the science of metrology. Metrology is the science of measurement. Metrology includes all theoretical and practical aspects of measurement.

In this practical course the trainee acquires knowledge in how to use electrical measuring devices in a safe and professional manner. It provides the trainees with the basic knowledge required to use electrical measuring instruments. This is done by teaching the theoretical component and executing the necessary experiments in the laboratory. Furthermore it enables the trainees to understand and evaluate measuring results of electrical values taken.

Department	Electrical/Electronic Technology		Specialization	Industrial Electronics
Course Name	Digital Circuits II		Course Code CAT	127ELC
Module			Credit hours	1
Trimester	5th		Course Code TVTC	167ELC
Weekly Contact Hours	L	1	Prerequisites	167ELC
	P	1		
	T	-		

Course Description

Digital circuits-II is an extension to digital circuits-I where further in depth study is covered. The encoder & decoder, multiplexing & de-multiplexing plus the comparator are covered in terms of their structure, design and applications. Different kinds of the flip flops are explained with examples on how to use them for different applications. In an advanced chapter, the shift registers (both series and parallel) are explained with the timing details. Building the counters (count up & count down) is also studied. The different kinds of memories are also explained in details of its structure and different ways for addressing and content storage. The course ended up with the analogue to digital and digital to analogue converters that are very useful in the mixed application where sensors are used with micro-processor or micro-controller.

Department	Electrical/Electronic Technology		Specialization	Industrial Electronics
Course Name	Electronic Circuits I		Course Code CAT	166ELC
Module			Credit hours	1
Trimester	5th		Course Code TVTC	166ELC
Weekly Contact Hours	L	4	Prerequisites	
	P	0		
	T	-		

Course Description

After studying the electronic components, the trainees are to study the electronic circuits that made of resistors, capacitors, transistors, operational amplifiers and crystals. He also has to use a PCB design software such as Electronic Workbench, circuit maker, proteus, or Orcad. This course is divided into 4 chapters: the first is about the transistor as a current amplifier. The second is about the Op Amps and how to design and use in the applications. The third is the timers and counters and how to design and use in different applications. The fourth is the crystals and sinusoidal waveform.

Department	Electrical/Electronic Technology		Specialization	Industrial Electronics
Course Name	Electronic Workshop I		Course Code CAT	145ELC
Module			Credit hours	1
Trimester	5th		Course Code TVTC	145ELC
Weekly Contact Hours	L	0	Prerequisites	
	P	6		
	T	-		

Course Description

In the electronic workshop course many of the skills and competences will be covered such as how to get to the data sheets for every electronic component, how to use the different applications for simulation, how to develop the digital circuits, how to operate those circuits and discover the damaged component and how to use the measuring equipment for the fixation purpose or for analyzing the circuit performance.

Workshop safety is also covered in details and the trainee has to practice it and observe it in every daily work in the workshop.

In the damage fixing chapter the trainee is to learn the 4 steps for fault finding in the electronic circuits. In the second chapter there are several practical exercises where the trainee is to apply his acquired skills. In the third chapter, advanced digital circuits are explained such as digital to analogue and vice versa. Also the Programmable Logic Devices are covered because it is important in minimizing the number of the circuit components in one integrated circuit.

Department	Electrical/Electronic Technology		Specialization	Industrial Electronics
Course Name	PLC I Programmable Logic Controller		Course Code CAT	248ELC
Module			Credit hours	2
Trimester	5th		Course Code TVTC	248ELC
Weekly Contact Hours	L	1	Prerequisites	167ELC
	P	1		
	T	0		

Course Description

A Programmable Logic Controller, PLC or Programmable Controller is a digital computer used for automation of electromechanical processes, such as control of machinery on factory assembly lines. PLCs are used in many industries and machines. Programs to control machine operation are typically stored in battery-backed-up or non-volatile memory. Before the PLC, control, sequencing, and safety interlock logic for manufacturing automobiles was mainly composed of relays, cam timers, drum sequencers, and dedicated closed-loop controllers. Since these could number in the hundreds or even thousands, the process for updating such facilities for the yearly model change-over was very time consuming and expensive, as electricians needed to individually rewire relays to change the logic. Whereas PLC controllers are easily to change instructions by just changing the software, no hardware changes are required in order to modify machine's functions and behavior. Therefore standard programming languages are used independently of the manufacturers or even PLC models used.
In this course the trainee will learn to understand the difference between hard-wired control circuits and PLC controlled circuits and he will be taught to configure the hardware of the PLC controller and how to program simple control task, as well as to trace faults and make trouble shootings.

Department	Electrical/Electronic Technology		Specialization	Industrial Electronics
Course Name	Electronic circuits		Course Code CAT	260ELC
Module			Credit hours	4
Trimester	6th		Course Code TVTC	260ELC
Weekly Contact Hours	L	3	Prerequisites	166ELC
	P	2		
	T	-		
Course Description				

In this course trainees will understand the basic skills required to build, execute and analysis different electronic circuits:

- Operational amplifiers
- Timers
- Sinusoidal oscillators
- Transistor amplifiers
- Integrated circuits

Department	Electrical/Electronic Technology		Specialization	Industrial Electronics
Course Name	WS3: Electronic Workshops		Course Code CAT	245ELC
Module			Credit hours	2
Trimester	6th		Course Code TVTC	245ELC
Weekly Contact Hours	L	0	Prerequisites	145 ELC 244 ELC
	P	4		
	T	0		
Course Description				
In this course which forms the third part of the workshop courses aims to give the trainees some practical skills on advanced measurement techniques and use of computer software to simulate some electronic circuits. In addition, this course presents a group of skills on the examination and troubleshooting of electronic circuits. Also, the trainees will gain skills in the execution of programmable logic device equipment.				

Department	Electrical/Electronic Technology		Specialization	Industrial Electronics
Course Name	Introduction to Control Systems		Course Code CAT	262ELC
Module			Credit hours	4
Trimester	6th		Course Code TVTC	262ELC
Weekly Contact Hours	L	3	Prerequisites	161 ELC
	P	2		
	T	0		
Course Description				
This is a new course in control systems. This course aims to give trainees basic skills in control technology systems. The course introduces control system technology. Components of this course include – elementary Signals and systems - basic industrial control modes. It also integrates practical applications. Trainees will gain skills in simulation of control systems.				

Department	Electrical/Electronic Technology		Specialization	Industrial Electronics
Course Name	Computers and Microprocessors I		Course Code CAT	251ELC
Module			Credit hours	2
Trimester	6th		Course Code TVTC	4251ELC
Weekly Contact Hours	L	0	Prerequisites	167 ELC
	P	4		
	T	0		
Course Description				
In this course the trainees will study the construction of microprocessors and programming. They will gain skills in the application of microprocessors in industry.				

Department	Electrical/Electronic Technology		Specialization	Industrial Electronics
Course Name	Programmable Logic Controllers II		Course Code CAT	248bELC
Module			Credit hours	2
Trimester	6th		Course Code TVTC	248ELC
Weekly Contact Hours	L	0	Prerequisites	167 ELC
	P	4		
	T	0		
Course Description				
In this course the trainees will study programmable logic controllers: its construction, its programming and applications in industrial control processes				

Department	Electrical/Electronic Technology		Specialization	Industrial Electronics
Course Name	Power Electronics		Course Code CAT	261ELC
Module			Credit hours	4
Trimester	7th		Course Code TVTC	261ELC
Weekly Contact Hours	L	3	Prerequisites	166 ELC 161 ELC
	P	2		
	T	0		
Course Description				
Study of solid state devices used in power electronics devices and their usage in different circuits such as · Converters · Choppers · AC voltage regulators · Inverters · Motor Control.				

Department	Electrical/Electronic Technology		Specialization	Industrial Electronics
Course Name	WS4: Troubleshooting		Course Code CAT	246ELC
Module			Credit hours	2
Trimester	7th		Course Code TVTC	246ELC
Weekly Contact Hours	L	0	Prerequisites	245 ELC
	P	4		
	T	0		
Course Description				
This course which is the fourth part of workshop courses aimed at giving trainees practical skills on advanced measuring techniques and equipment maintenance. In addition, this course presents a group of skills on examination and troubleshooting of electronic equipments in different fields and applications.				

Department	Electrical/Electronic Technology		Specialization	Industrial Electronics
Course Name	Control System Analysis		Course Code CAT	263ELC
Module			Credit hours	4
Trimester	7th		Course Code TVTC	263ELC
Weekly Contact Hours	L	3	Prerequisites	262 ELC
	P	2		
	T	0		

Course Description

This is the second course in control systems. In this course the trainees will gain a basic knowledge in control analysis:

- characteristics
- First and second order system responses
- time analysis of control systems
- Control system error analysis
- Stability
- Design and compensation in control systems
- Frequency responses of Control systems.

Department	Electrical/Electronic Technology		Specialization	Industrial Electronics
Course Name	Computers and Microprocessors II		Course Code CAT	251bELC
Module			Credit hours	2
Trimester	7th		Course Code TVTC	4251ELC
Weekly Contact Hours	L	0	Prerequisites	167 ELC
	P	4		
	T	0		
Course Description				
In this course the trainees will study the construction of microprocessors and programming. They will gain skills in the application of microprocessors in industry.				

Department	Electrical/Electronic Technology		Specialization	Industrial Electronics
Course Name	Graduation Project		Course Code CAT	252ELC
Module			Credit hours	2
Trimester	7th		Course Code TVTC	252ELC
Weekly Contact Hours	L	0	Prerequisites	All courses in the Trimesters before
	P	4		
	T	0		
Course Description				
Study, design and implement a mini or part of a project of what the trainees should expect to find in their professional lives.				