Safety Course and Test Regulations

Report compiled by the Safety4El partners in CY, DK, ES, MT, and UK

Project: Safety4El
Improved Safety for Electricians

Safety Training and tests for electricians across the partnership countries.

Author for DK: Mr. William W. Lynge
Author for GB.: Mr Russell Tucker
Author for CY.: Dr Stylianos Hirodonti
Author for ES.: Mr. Jokin Goyoaga
Author for MT.: Mr. Marjhon Demanuele

General

To become a skilled electrician in the different partnership countries, you have to go through some formal education. This project will use the British system as a reference and match the other countries systems against it. To do so, we will list the length, level and objectives of the different countries in the table below and highlight the items relating to safety issues.
All countries are regulated by some common European standards, and can have some national variations. The mother of all the referred standards build on HD 60 364 series. (ie. BS 7671)

	Danish Education
Duration	4 years; 55 weeks in school and 153 weeks on the job training, or 4,5 years; 60 weeks in school and 174 weeks on the job training.
VET systems	Danish VET programmes are alternating programs, which means that the education and training activities alternate between education and training at a school and on-the-job training in an enterprise. The Danish educational system is based on competencies and the learning outcomes are described as Competency objectives. These objectives are broken down into specific learning outputs. Within the first year the students must acquire certain certificates and common learning outputs. Thereafter the students can specialize themselves and must choose at least 4 modules with duration of 4 weeks each. There are 33 different modules to choose from. There is a specific progression in the modules meaning that the student must choose at least one module among 9 (beginner) modules. Hereafter the student can choose modules at a higher level and so forth.
Level of the training	Level 3-4 EQF
Content (competency objectives) relating safety issues	The overall objectives under the headline Safety and work environment are described as: The student must have competence on a basic level to: - choose environmentally correct installations material in domestics and use it properly according to manufacturer's instructions. - carry out work in safety and environmentally responsible manner in

	accordance with applicable rules, including the safety of persons, livestock and property against dangers and damage that may occur in normal use of electrical installations. - perform work on or near the de-energized and live installations in homes, switchgear and cable cabinets. - comply with applicable laws, rules and standards relating to work performed.
Learning outputs	The student: - Is able to use and maintain the devices and hand tools properly when performing high and low current installations - is able to provide basic first aid at accidents and diseases, and putting out small fires and prevent fires from spreading, according to applicable laws, rules and standards. - has basic knowledge of the trades work and personal protective equipment, including knowledge of ergonomically correct posture in relation to the tasks with drag and lift. - can perform tasks safely and environmentally proper in accordance with applicable rules, including providing security for people, livestock and property against dangers and damage that can occur during normal use of electrical installations. - can under the instruction and supervision, work on and near by de-energized and live installations in homes and buildings. - can in an economical and safe manner choose working methods for simple tasks. - can independently and in collaboration with others attend setup, dismantling and relocation of mobile and trestles scaffolding. - has knowledge of the applicable regulations, and can work with chemical substances used in connection with installation work, and can handle these correctly by the instructions of the manufacturer. - can perform work and operating tasks on or near switchgear and electrical installations in compliance with the prescribed precautions, so that no danger to persons, construction and operation occurs. - can perform the hot work with the spark-producing tool (for example a grinder, soldering tools and hot air blower fire) technically correct.
Certificates	- L-aus certificate (Work on or near live installations) - Or “Live Working Certificate” according to EN 50110-1 (operations of electrical installations) - 1. Aid certificate - Firefighting certificate (basic level, according to The Danish Institute of Fire and Security Technology) - Scaffolding certificate (according to the Danish working environment authority demands)
Additional courses	- Once a year employees must update their L-aus certificate (not mandatory, but commonly accepted by the trade committee)

	Maltese education
	Qualified electricians need to get a wireman licence. There are two levels A and B. Wireman electrical licence A is fit to carry out works in domestic environment (single phase systems), while wireman's licence B is fit to carry out works in an industrial environment (three phase systems).
Duration	Basic schooling for licence A is a 150 hour course in preparation for the exam for licence A and another 230 hour schooling course in preparation for examination for licence B. Both examinations are followed by an interview and after a period of industrial experience, there would be another interview by the REWS (Regulator for Energy and Water Systems).
VET systems	The electrician's Authorisation is issued by the Regulator for Energy and Water Systems (REWS) on the recommendation of the Technical Board (set up by the minister of education) to persons who: • have passed the wireman's examination set by the Exams Department, or provide equivalent qualifications approved by the Authority; • have at least 18 years of age; and • have completed at least 12 cumulative months of experience in electrical installation work for Authorisation A and 24 cumulative months experience for Authorisation B. The following are required for Authorisation to be issued: • Certificates of qualifications and passes in examinations; or as the case may be, certificates of equivalent qualification issued by NCHFE (National Commision for Higher and Further Education); and • Letter of recognition of practical experience by a qualified electrician either in possession of an Authorisation A or B or a warranted electrical engineer, if the applicant is applying for an Authorisation A, or an electrician in possession of Authorisation B or a warranted electrical engineer, if the applicant is applying for authorisation B.
Level of the training	License A Level 3 EQF License B Level higher than 3 but lower than 4 EQF
Content (competency objectives) relating safety issues	Extract from license A syllabus related to health and safety. 3. Requirements for safety, Handling of tools and equipment, Precautions and Procedures. 4. First aid. Extract from license B syllabus related to health and safety.

	2. Electrical Safety i. Describe the precautions to be taken when working on or near "live" equipment. ii. Describe the action to be taken in the event of accident to personnel. iii. Describe reporting procedures. 3. Fire Safety 1. Fire prevention: (a) conditions required for combustion. (b) methods of dealing with different types of fire. 2. Types of fire extinguishers and their appropriate uses. 3. Dangers from toxic fumes and smoke, and materials which produce them.
Main topics in syllabi for license A and B	Licence A a) Theory: • DC cirucits • Domestic tariffs and cost of energy • Heating and machine efficiencies • Capacitors • Magnetism • Instruments • Transformers • AC theory (Series circuits) • Illumination b) Technology: • Basic first aid and fire awareness • Materials • Joints and terminations • Methods of installations and wiring accessories • Circuit protection systems • Heating systems • Electrical system layout • Sequence of incoming supply • Earthing systems • Standard circuits • Maximum demand and diversity • Size of conduit, trunking and current carrying capacity. • Low voltage systems • Bathrooms, construction sites, caravans and temporary installations. • Earthing systems • Testing and inspection • Certification. License B a) Theory: • Effects of temperature on resistance

	• Kirchoff's laws • AC theory (parallel circuits) • Three phase circuits and power factor correction • Electrical industrial tariffs • Transformers • DC machines • Three phase induction motors • Rectifiers b) Technology: • Electrical and fire safety • Wiring systems and special installations • Cable installation and consumer switch gear protection • Distribution • Measurements and metering • Installation of machines including reduced voltage starters. • Testing and inspection
Certificates	- Recognised electricians must hold a valid Wireman's license A for domestic applications and B for industrial applications.
Additional courses	- As the system stands, a person can do his/her schooling on his/her own. There are numerous other courses mainly at MCAST and other private tuition schools that provide schooling to obtain the adequate competence to sit for the exam.

	Spanish Education
Duration	2 years (2000h); 1620 hours in school and 380 hours on the job training
VET systems	The Spanish VET educational system is based on competencies and the learning outcomes are described as knowledge, skills and competence objectives. These objectives are broken down into specific learning outputs. The Spanish Vocational training consists of four components: • General Education, aimed at the development of common skills, attitudes and general knowledge. • Basic Professional Training, which is oriented towards the development of skills and basic technological-scientific knowledge, connected to a group of professions or professional fields. • Specific Professional Training, with skills and knowledge more professional, related to a profession understood as a set of different possible jobs. • Professional Training on the Job: skills and knowledge specific to a specific job, which are acquired through a traineeship period in a

	production center.
Level of the training	Level 3 EQF
Content (competency objectives) relating safety issues	The overall objectives under the headline Safety and work environment are described as: The student must have competence on a basic level to: Fitting and maintaining low voltage electrical installations, electric machines and automated systems, applying current legislation, quality, safety and labour risk protocols, guaranteeing their functionality and respect for the environment.
Learning outputs	The student: Complies with the rules on labour risk prevention and environmental protection, identifying associated risks and measures and equipment to prevent them. Determines the protective action of the Spanish Health Service in view of the different covered eventualities, identifying the different types of assistance. Assesses risks derived from his/her activity, analysing job conditions and risk factors present in his/her labour setting. Participates in the development of a risk prevention plan in a small enterprise, identifying the responsibilities of all agents involved. Applies protection and prevention measures, analysing risk situations in the labour setting of the Technician in Electrical and Automatic Installations.
Certificates	"Certificado de Cualificación Individual en Baja Tensión", which could be translated translated as "Low Voltage Individual Qualification Certificate" "Certificado de formacion de Nivel Basico en Prevencion de Riesgos Laborales", which could be translated as " Basic Certificate on Work Risks Prevention Formation Certificate"
Additional courses	There is no mandatory additional courses.

	United Kingdom Education
Duration	4 years; 726 Guided learning hours at college and 5500hrs or146 weeks on the job training

VET systems	The UK VET programmes are alternating programs, which means that the education and training activities alternate between education and training at a school and on-the-job training. The UK Apprenticeship comprises of four parts. • The Learner must have or attain level 3 EQF (2 QCF) in Mathematics, English and ICT. • Achieve a Level 4 EQF (3QCF) Knowledge based Technical Diploma consisting of 8 modules. • Achieve a Level 4 EQF (QCF3) National vocational Qualification consisting of 5 modules. • Achieve the AM2 a synoptic end point assessment coving all modules set by an external independent body.
Level of the training	Level 4 EQF (3QCF)
Content (competency objectives) relating safety issues	NETK3-01 .Understand Health, Safety and environmental considerations. Unit Aim: Provide learners with an understanding of the relevant health and safety legislation, practices and procedures when installing and maintaining electrical systems and equipment. The knowledge covered in this unit underpins the practical application of health and safety legislation, practices and procedures. 1. Understand how relevant legislation applies in the workplace. 2. Understand the procedures for dealing with environmental and health and safety situations in the work environment. 3. Be able to demonstrate and understand the procedures for establishing a safe working environment. 4. Understand the requirements for identifying and dealing with hazards in the work environment.
Learning outputs	1.1 Identify roles and responsibilities with regard to current relevant 1.2 Identify roles and responsibilities with regard to current relevant environmental legislation. 2.1 State the procedures that should be followed in the case of accidents which involve injury, including requirements for the treatment of electric shock/electrical 2.2 Specify appropriate procedures which should be followed when emergency situations occur in the workplace. 2.3 State the actions to be taken in situations which exceed their level of responsibility for Health and Safety in the workplace. 2.4 Specify appropriate responsible persons to whom health and safety and welfare related matters should be reported. 2.5 Describe the ways in which the environment may be affected by work activities. 2.6 Specify the current requirements and good working practices for processing waste on site. 2.7 Explain why it is important to report any hazards to the environment that arise from work procedures.

	3.1 State the procedure for producing risk assessments and method statements in accordance with their level of responsibility. 3.2 Describe the procedures that should be taken to remove or minimise risks before deciding PPE is needed. 3.3 State the purpose of PPE. 3.4 Specify the appropriate protective clothing and equipment that is required for identified work tasks. 3.5 State the first aid facilities that must be available in the work area in accordance with health and safety regulations. 3.6 Explain why it is important not to misuse first aid equipment/supplies and to replace first aid supplies once used. 3.7 Describe and demonstrate safe practices and procedures for the use of equipment and materials in the working environment. 3.8 Specify and demonstrate the procedures for ensuring electrical systems are safe to work on. 3.9 State the implications of: • Carrying out safe isolation procedures • Not carrying out safe isolation procedures. 4.1 Identify hazard symbols on packaging and labelling of substances and mixtures. 4.2 Define what is meant by the term hazard in relation to health and safety legislation in the workplace. 4.3 Identify specific hazards associated with the installation and maintenance of electrical systems and equipment. 4.4 Describe situations which can constitute a hazard in the workplace. 4.5 Explain practices and procedures for addressing hazards in the work place. 4.6 Identify the correct type of fire extinguisher for a particular type of fire. 4.7 Explain situations where asbestos may be encountered. 4.8 Specify the procedures for dealing with the suspected presence of asbestos in the workplace.
Certificates	The Health and safety unit can be achieved within the first 10 weeks of training enabling the learner to gain an ECS (Apprentice) card to start working on work sites. Completion of the apprenticeship gains the following certification. - Level 4 EQF (QCF3) Knowledge based Technical Diploma. - Level 4 EQF (QCF3) National vocational Qualification (NVQ). - AM2 certificate. - Understand the Requirements for Electrical Installations BS 7671(current) - Gold ECS (Electrician) card.
Additional courses	This is required to enable electricians to put a new or existing installation into service. • Understand the Requirements of Electrical Installations BS 7671: as amended • Principles, practices and legislation for the initial verification of electrical installations

	• Principles, practices and legislation for the periodic inspection, testing and condition reporting of electrical installations
Duration	ECS and CSCS health and safety cards should be renewed between 18 months and 3 years dependent on grading level.

	Cyprus Education
Duration	3 years taught course, 1 year professional work experience **YEAR 1:** All first-year students follow common courses of study that fall under both the theoretical and practical direction. **YEAR 2 and 3:** Second-year students follow the specific subject stream they have chosen and are now in a position to select a course of specialisation in which they will continue to the end of their third year of studies.
VET systems	The vigour and speed with which the economy of Cyprus is changing obliges STVE to offer a wide range of programme subjects and professional specialisations. These must correspond with current concentrations of economic activity and address the contemporary and newly-arising needs and standards of the greater Cypriot economy. STVE aims to prepare the individual entering the labour market to function dynamically and creatively, so that human knowledge and achievement might be employed with optimum productivity. The study areas and specialisations of STVE are concentrated under two headings: Theoretical Studies and Practical Studies.
Level of the training	Level 3 EQF
Content (competency objectives) relating safety issues	The specific syllabus for the Electrical Technician Course contains the following: • Technical and Electrical Drawing • Safety and Electricity Measures • Introduction to Electrical Installations • Introduction to Automation • Electricity I • Health and Safety • Technology and PC and peripherals laboratories

	• Technology and analog electronic workshops (Theoretical Course and Practical Course) • Principles and matters of electronic communications (Theoretical Course and Practical Course)
Learning outputs	Purpose & Objectives: The "Security in the use of electricity and safety at work" aims at providing the student with an understanding of the importance of health and safety at work. The subsection targets at providing the student with the necessary knowledge and skills that will help him/her protect oneself, prevent accidents and/or provide first aid where it would be needed. The objective is for the student to understand the dangers in the use and practice of electricity, to learn how to protect oneself and how to treat an electrical incident. In addition, to learn how to properly use the defibrillator, to provide first aid and to use fire extinguishers to extinguish a fire.
Certificates	No certificate for the Health and Safety course in Cyprus
Additional courses	This is required to enable electricians to put a new or existing installation into service. • Understand the Requirements of Electrical Installations BS 7671: as amended • Principles, practices and legislation for the initial verification of electrical installations • Principles, practices and legislation for the periodic inspection, testing and condition reporting of electrical installations