資歷架構
Qualifications Framework

Security Services Industry

SCS-based training package

Basic Premises Security Systems Installation course (Level 2)

Feb 2022

FOREWORD

“Training Packages are SCS-based, with learning and assessment materials derived from the selected UoC(s) which correspond with the job role and function. The performance requirements in the UoC(s) are applied in the learning outcome of the Training Package, and the learning and assessment materials correspond with the learning outcome. The contents are developed for the specific learner profile, mode of learning and assessment method, which can be used as reference in module designs.

This Training Package outlines the essential elements for a module, using UoC 107692L2 “Perform basic installation including wiring and cabling of a security system for a client's site” which correspond with designated job role and function “Basic Security System Installation” in the Security Services industry and offering for reference the contents of learning, assessment guidelines, as well as supporting and reference materials. It exemplifies the design of module structure, and comes with suggestions on teaching, learning and assessment materials. Assessment materials include sample tasks or activities, methods and contexts of assessment, outcome standards and performance rubric that are appropriate to the contents of learning.

This Training Package is not meant to be a complete learning programme by itself. Enterprises and education and training providers who wish to use it as a blueprint for module development should adjust the relevant teaching, learning and assessment contents for any variations in learning objectives, target learners, entry requirements such as academic level and experience, etc. In addition, users are advised to check and adopt the latest update of the references to ensure their currency, validity and accuracy when using it. For any learning programme developed by drawing reference to this Training Package to become QF-recognised, it must successfully pass the quality-assurance process of the Hong Kong Council for Accreditation of Academic and Vocational Qualifications or the self-accrediting institutions.”

List of Content

Overview

Introduction

This Training Package is based on UoC 107692L2 and is designed as the teaching plan of the “Basic Premises Security Systems Installation Course” for those engaged in the installation of basic premises security systems or interested in providing such services. Please refer to Appendix 1 and Appendix 2 for details of UoC 107692L2 and mapping of the course outline against the functional areas.

The “Basic Premises Security Systems Installation Course” aims at teaching basic practical knowledge and skills for the installation of premises security systems. Learners will learn how to effectively install basic security systems (including: intrusion detection alarm systems, video recording or CCTV recording systems and access control systems, etc.) in accordance with the design and relevant policies, procedures, and guidelines of the company.

This Training Package is compiled with the intent to guide training institutions on how to systematically develop the teaching plan for the “Basic Premises Security Systems Installation Course”. After reading through this Training Package, training institutions should get a good understanding of the teaching and learning requirements, conditions, and contents of UoC 107692L2, thereby reducing the cost of course development and ensuring the course quality.

Syllabus and Instruction for Use

The “Basic Premises Security Systems Installation Course” is consisted of 12 topics, which correspond to the knowledge and skills covered in UoC 107692L2. The course outline includes:

1. Relevant laws and license requirements
2. Project management roles and responsibilities and site culture
3. Occupational safety and health at the installation site
4. Installation progress management
5. Basic knowledge of low voltage and extra low voltage
6. Installation quality and standard
7. Basic diagrams related to the installation of premises security systems
8. Common types of security devices, purposes, and installation methods
9. Common types and installation methods of electric locks and adjustment of door closers
10. Types of cables and methods of connecting and laying cables
11. Types of cable containers, purposes, and installation methods
12. Common installation tools and practical exercises

This Training Package is divided into three sections:

The first section provides general instructions covering topics such as:

- Aims
- Syllabus
- Teaching Objectives
- Intended Learning Outcomes
- Learners
- Qualification of Trainers
- Teaching Mode
- Assessment Mode
- Course Developing and Management

The second section outlines the teaching and assessment guidelines for each of the 12 topics of the “Basic Premises Security Systems Installation Course”, including:

- Teaching Guidelines
  - Intended Learning Outcomes
  - Contact Hours
  - Self-study Guidelines for Learners
  - Suggested Scope, Contents and Materials
- Assessment Guidelines
  - Assessment Mode
  - Scope of Assessment
  - Marking Rubrics
- List of Training Aids
- References

The third section is “Self-study Guidelines for Learners” which is a consolidation of the scope of knowledge and skills that the learners must review before certain lessons.

Appendix 1: UoC 107692L2

Specification of Competency Standards for the Security Services Industry
Unit of Competency

Title	Perform basic installation including wiring and cabling of a security system for a client's site
Code	107692L2
Range	This unit of competency applies to frontline security personnel responsible for the installation and servicing of security systems and devices of a company holding a Type III security company license for providing relevant security work in Hong Kong. It covers the abilities to perform installation of a security system for a client's site including wiring and cabling, in accordance to design and the laid-down policies, procedures, and guidelines of the company.
Level	2
Credit	2
Competency	Performance Requirements: 1. Knowledge about installation including wiring and cabling: • Understand the requirements of the Security and Guarding Service Ordinance (Cap 460) for security personnel engaged in the design, installation, repair and /or maintenance of security systems and devices to hold a valid Category D Security Personnel Permit • Understand the requirements under the Electricity (Registration) Regulations (Cap 406D) for all workers engaged in electrical work to be registered as an Electrical Worker with the Electrical & Mechanical Services Department • Understand the company's policy, procedures, and guidelines with regard to installation, wiring and cabling of a security system • Understand the company's policy, procedures, and guidelines with regard to health and safety when carrying out installation, wiring and cabling work • Possess the analytical skills and critical thinking skills to identify issues and resolve problems and conflicts • Possess the people skills and communication skills to deal with others • Possess the literacy skills to clearly and accurately record information and activities 2. Perform basic installation including wiring and cabling of a security

	system for a client's site Be able to: • Complete installation, wiring and cabling work at the client's site within the scheduled timeframe • Use the correct system and devices as specified • Use the correct type of cable • Install the system and devices according to design • Lay wiring and cabling according to design • Operate systems, devices, equipment and tools correctly and safely • Observe all relevant policies, procedures, and guidelines of the company
Assessment Criteria	The integrated outcome requirements of this UoC are the abilities to: • Perform installation, wiring and cabling of a security system for a client's site; and • Ensure that work was done according to design and relevant policies, procedures, and guidelines of the company.
Remark	Unit of Competency (UoC) 107692L2 is developed through the joint efforts of relevant stakeholders including SGSIA and the trade. Graduates from programmes UoC 107692L2 accredited by the Hong Kong Council for Accreditation of Academic and Vocational Qualifications (HKCAAVQ) will be considered as having received training relevant to basic security system installation work when applying for Category D security personnel permit.

Appendix 2: Mapping of Course Outline against Functional Areas

Topic:#	Topic:
Getting Started	
1.	Relevant laws and license requirements
Work Management	
2.	Project management roles and responsibilities and site culture
3.	Occupational safety and health at the installation site
4.	Installation progress management
Work Practices	
5.	Basic knowledge of low voltage and extra low voltage
6.	Installation quality and standard
7.	Basic diagrams related to the installation of premises security systems
8.	Common types of security devices, purposes, and installation methods
9.	Common types and installation methods of electric locks and adjustment of door closers
10.	Types of cables and methods of connecting and laying cables
11.	Types of cable containers, purposes, and installation methods
12.	Common installation tools and practical exercises

Performance Requirements of UoC 107692L2	**Topic:#**
Knowledge about installation including wiring and cabling:	
• Understand the requirements of the Security and Guarding Service Ordinance (Cap 460) for security personnel engaged in the design, installation, repair and /or maintenance of security systems and devices to hold a valid Category D Security Personnel Permit	1
• Understand the requirements under the Electricity (Registration) Regulations (Cap406D) for all workers engaged in electrical work to be registered as an Electrical Worker with the Electrical & Mechanical Services Department	1, 5

• Understand the company’s policy, procedures, and guidelines with regard to installation, wiring and cabling of a security system	2, 6
• Understand the company’s policy, procedures, and guidelines with regard to health and safety when carrying out installation, wiring and cabling work	2, 3
• Possess the analytical skills and critical thinking skills to identify issues and resolve problems and conflicts	2, 4
• Possess the people skills and communication skills to deal with others	2, 4
• Possess the literacy skills to clearly and accurately record information and activities	4
Perform basic installation including wiring and cabling of a security system for a client’s site, be able to:	
• Complete installation, wiring and cabling work at the client’s site within the scheduled timeframe	4
• Use the correct system and devices as specified	7, 8, 9
• Use the correct type of cable	10
• Install the system and devices according to design	7, 8, 9
• Lay wiring and cabling according to design	10, 11
• Operate systems, devices, equipment and tools correctly and safely	12
• Observe all relevant policies, procedures, and guidelines of the company	3, 4, 6
Assessment Criteria	
• Perform installation, wiring and cabling of a security system for a client’s site	
• Ensure that work was done according to design and relevant policies, procedures, and guidelines of the company	

Section 1: General Instruction

Aims

This Training Package of “Basic Premises Security Systems Installation Course” is based on UoC 107692L2 and aims at teaching practical knowledge and skills relating to the installation of basic premises security systems in a systematic manner. Upon completion of the course, it is expected that learners will be able to effectively install basic premises security systems and will carry out the installation in accordance with the design and relevant policies, procedures, and guidelines of the company.

We therefore recommend that training institutions should adopt this Training Package as their teaching plan for the "Basic Premises Security Systems Installation Course". This will ensure that learners can learn about the practical knowledge and skills required in a systematic manner and can effectively apply them to the installation of basic premises security systems.

Syllabus

This “Basic Premises Security Systems Installation Course” is consisted of the following 12 topics:

1. Relevant laws and license requirements
2. Project management roles and responsibilities and site culture
3. Occupational safety and health at the installation site
4. Installation progress management
5. Basic knowledge of low voltage and extra low voltage
6. Installation quality and standard
7. Basic diagrams related to the installation of premises security systems
8. Common types of security devices, purposes, and installation methods
9. Common types and installation methods of electric locks and adjustment of door closers
10. Types of cables and methods of connecting and laying cables
11. Types of cable containers, purposes, and installation methods
12. Common installation tools and practical exercises

Teaching Objectives

This Training Package is specially designed for those who are engaged in the installation of basic premises security systems or interested in providing such services. It teaches them the practical knowledge and skills to effectively install basic premises security systems and ensure that they carry out the installation work in accordance with the design and relevant policies, procedures, and guidelines of the company.

Regarding the course structure, learners will firstly be introduced to relevant laws and

regulations and license requirements as well as what they should know about installation (including: project management roles and responsibilities, occupational safety and health in the construction site and progress management). After that, learners will learn practical knowledge and skills about the installation of basic premises security systems (including basic knowledge about voltage, quality and standards, diagrams related to the installation of basic security systems, security devices, cables, and other relevant equipment and common tools, etc.). Lastly learners will practise basic installation work and receive immediate feedback from the Trainer.

Intended Learning Outcomes

Upon completion of this “Basic Premises Security Systems Installation Course”, it is expected that learners will be able to:

- Effectively install basic premises security systems; and
- Carry out installation work in accordance with the design and relevant policies, procedures, and guidelines of the company.

Learners

It is suggested that target learners should meet the following conditions:

- Are at the age of 18 or above; and
- Are interested in performing security work in relation to the installation of basic premises security systems

Qualification of Trainers

It is suggested that the Trainer should, as a minimum, possess qualifications as follows:

- Possess qualifications related to “Physical Security and Technological Support” at Qualifications Framework Level 3 (inclusive of “Recognition of Prior Learning”); and
- Possess 5 years or above practical work experience in installing premises security systems; and
- Possess 2 years or above training experience; and
- Being able to read and write in the language to be used as the medium of instruction

(Remark: Apart from the above suggested qualifications, training institutions may also consider whether a Trainer has sufficient knowledge and skills with regard to electricity safety, e.g. being a Class A Electrical Works Registered Personnel or Registered Electrical Contractor, etc.)

Teaching Mode

The teaching mode of the “Basic Premises Security Systems Installation Course” is mainly consisted of lectures, discussions, and practical exercises. It is hoped that learners will acquire the necessary knowledge and skills through these activities and gain deep understanding about how to apply them to their daily work.

The recommended ratio of in-person class to self-study hours and the ratio of trainer to trainee for in-person class are listed below:

Teaching Mode：	In-person class
Total Credit Hours:	20 hours
In-person Class to Self-study Ratio:	9：1
Contact Hours (minimum):	18 hours
Trainee Self-study Hours:	2 hours
Trainer-to-Trainee Ratio (maximum)	1：30

The recommended number of contact hours for each topic is listed below:

Topic:		**Recommended Contact Hours**
1.	Relevant laws and license requirements	0.5
2.	Project management roles and responsibilities and site culture	0.5
3.	Occupational safety and health at the installation site	0.5
4.	Managing installation progress	1
5.	Basic knowledge of low voltage and extra low voltage	0.5
6.	Installation quality and standard	1
7.	Basic diagrams related to the installation of premises security systems	2
8.	Common types of security devices, purposes, and installation methods	3
9.	Common types and installation methods of electric locks and adjustment of door closers	1
10.	Types of cables and methods of connecting and laying cables	1
11.	Types of cable containers, purposes, and installation methods	1
12.	Common installation tools and practical exercises	5
	Written Examination	1
	Total:	18

Regarding the 2 hours of self-study, it is recommended that learners should use this time to enhance relevant practical knowledge, the scope of which is listed in relevant topics and

consolidated in the Self-study Guidelines for Learners.

Assessment Mode

In order to evaluating whether the learners have fully grasped the practical knowledge and skills for the installation of basic premises security systems and whether the intended learning outcomes have been achieved, it is recommended that each trainee is to be assessed by way of practical exercises and written examination at the end of the course. These should respectively take up 30% and 70% of their total performance.

Details of the practical exercises and their Assessment Mode can be found in the suggestions and materials of the relevant section.

It is recommended that the course-end examination should be in writing and in the form of multiple-choice questions. The scope of examination should cover the topics in the course outline as follows:

Topic:		**Number of Questions**
1.	Relevant laws and license requirements	1
2.	Project management roles and responsibilities and site culture	1
3.	Occupational safety and health at the installation site	1
4.	Installation progress management	2
5.	Basic knowledge of low voltage and extra low voltage	3
6.	Installation quality and standard	3
7.	Basic diagrams related to the installation of premises security systems	4
8.	Common types of security devices, purposes, and installation methods	9
9.	Common types and installation methods of electric locks and adjustment of door closers	1
10.	Types of cables and methods of connecting and laying cables	4
11.	Types of cable containers, purposes, and installation methods	3
12.	Common installation tools and practical exercises	3
	Total:	35

The recommended Assessment Mode of the course-end examination is summarized below:

Assessment Mode：	Written Examination
Content of Examination:	Multiple Choice Questions
Number of Questions:	35 (The scope should cover all the topics in the Course Outline and

	be in the ratio as listed in the above table)
Pass Mark:	Training institutions should set an appropriate pass mark based on the breadth and depth of the questions.

Training institutions should prepare a question bank and ensure that at least 50% of the questions of each examination are different from those of the previous one.

Training institutions should establish necessary examination rules and ensure that learners fully understand and comply with them.

Training institutions should establish a system to ensure that examination results are accurately recorded.

Course Developing and Management

Education and training institutions should closely keep track of the training needs of the industry and the guidelines and rules set by relevant regulators (e.g. The Security and Guarding Services Industry Authority) and revise the

Section 2: Teaching and assessment Guidelines

Topic: "Relevant laws and license requirements"

Teaching Guidelines

Intended Learning Outcomes

Upon completion of this lesson, it is expected that learners will understand the license requirements for engaging in security work for designing premises security systems and the associated laws and regulations.

Contact Hours

It is recommended that the contact hours for this lesson should be not more than 0.5 hour.

Self-study Guidelines for Learners

It is recommended that learners revise the materials at the websites listed below before the lesson:

Relevant Materials	**Website Addresses**
• "Security and Guarding Services Ordinance" (Laws of Hong Kong, Cap. 460)	
➢ The Security and Guarding Services Industry Authority is established under the "Security and Guarding Services Ordinance" (Laws of Hong Kong, Cap. 460) to regulate the security industry. What are its key functions?	https://www.sb.gov.hk/eng/links/sgsia/index.html
➢ Definitions of "Security Work" and "Security Device"	https://www.sb.gov.hk/eng/links/sgsia/howto-spp.html
➢ Categories of "Security Work"	
➢ Application Procedures of a Security Personnel Permit	
➢ Which category of "Security Work" does the "installation of premises security systems" belong to?	https://www.sb.gov.hk/eng/links/sgsia/spp.html
➢ What are the criteria that one must meet when applying for a security personnel permit for providing services in relation to	https://www.sb.gov.hk/eng/links/sgsia/pdf/GN%20-%20Criteria%20for%20Security%20Pe

"installation, maintenance and /or repairing of a security device and /or designing (for any particular premises or place) a system incorporating a security device"?	rsonnel%20Permit%20(Eng).pdf
• "Electricity Ordinance" (Laws of Hong Kong, Cap. 406)	
➢ All workers engaged in electrical work on fixed electrical installations must be registered with the Electrical and Mechanical Services Department (EMSD). The purpose is to ensure that such work is carried out only by qualified electrical workers.	https://www.emsd.gov.hk/en/electricity_safety/how_to_apply/registering_as_an_electrical_worker_for_electrical/index.html
➢ What does "electrical work" mean?	
➢ What are fixed electrical installations?	
➢ Persons engaged in work on which type of electrical appliances are not required to be registered?	
➢ There are five grades of certificates of registration. What are the requirements in qualifications, training and experience in each grade?	
• "Factories and Industrial Undertakings Ordinance" (Laws of Hong Kong, Cap. 59)	
➢ The purpose of the "Factories and Industrial Undertakings Ordinance"	https://www.labour.gov.hk/eng/legislat/content3.htm
➢ The coverage	
➢ "Construction Sites (Safety) Regulations" (Cap.59 Section 7) requirements in relation to the following sections: ▪ Part VA Scaffolds, Working Platforms and Ladders, etc. ▪ Part VII Miscellaneous Safety Requirements	https://www.elegislation.gov.hk/hk/cap59I!en?INDEX_CS=N&xpid=ID_1438403505486_003

Suggested Scope, Contents and Materials

It is recommended that the lesson should focus on the following three areas:

1. Installing premises security systems is a category of "security work" that is regulated by the "Security and Guarding Services Ordinance" (Laws of Hong Kong, Cap. 460). Security personnel involved in related services must possess a valid Security Personnel Permit.

It is suggested that the Trainer should guide the learners to discuss:

- Purpose of the “Security and Guarding Services Ordinance” (Laws of Hong Kong, Cap. 460)
- Key roles of the Security and Guarding Services Industry Authority
- Definition of “security work” and “security device”
- Categories of “security work” and the category that “installing premises security systems” belong to
- Application procedures of a Security Personnel Permit
- The criteria for the issuance of relevant Security Personnel Permit

1. “Electricity Ordinance” (Laws of Hong Kong, Cap. 406) requires that all workers engaged in electrical work on fixed electrical installations must be registered with the Electrical and Mechanical Services Department (EMSD).

   It is suggested that the Trainer should guide the learners to discuss:

   - What is the purpose of registration?
   - What does “electrical work” mean?
   - What are “fixed electrical installations”?
   - Persons engaged in which types of electrical appliances or work are exempted from registration?
   - There are five grades of certificates of registration. What are their requirements in qualifications, training, and experience?
   - What are the application procedures for registration?
   - Are persons engaged in the installation of security systems required to register with the Electrical and Mechanical Services Department? Which grade of certification would that be?

2. “Factories and Industrial Undertakings Ordinance” (Laws of Hong Kong, Cap. 59)

   It is suggested that the Trainer should lead the learners to discuss:

   - Purpose of the ordinance
   - Coverage of the ordinance
   - Duties of each employee at a construction site
   - Safety rules relevant to a construction site

Assessment Guidelines

Assessment Mode

Multiple Choice Questions

Scope of Assessment

Sample Question	Model Answer
Which of the following is not a factor of consideration for the issuance of a Security Personnel Permit? (A) The applicant's age (B) The applicant's professional skills training certificate (C) The applicant's employment certificate or employment record (D) The applicant's character (E) All the above answers are correct	E

Marking Rubrics

To be able to select the Model Answer

List of Training Aids

- No suggestions

References

(Remark: These references are intended for trainers. Their scope may exceed the depth and breadth of relevant topics in the UoC. Training institutions should tailor the materials to suit the needs and abilities of the learners if they decide to adopt them as training materials for the use of the Learners. Copyrights should also be observed. Some of the References may not provide Chinese translation of the materials. Training institutions should translate the materials for the use of the Learners where necessary.)

- "Security and Guarding Services Ordinance" (Laws of Hong Kong, Cap. 460) (must be the latest version); downloadable free of charge from the Hong Kong e-Legislation website (https://www.elegislation.gov.hk/); the latest version at the time of writing this training package was October 2014

- Key roles of the Security and Guarding Services Industry Authority (must be the latest version); downloadable free of charge from the Security and Guarding Services Industry Authority website (https://www.sb.gov.hk/eng/links/sgsia/index.html); the latest version at the time of writing this training package was 19 November 2020

- Relevant information of the Security Personnel Permit (must be the latest version); downloadable free of charge from the Security and Guarding Services Industry Authority website (https://www.sb.gov.hk/eng/links/sgsia/index.html); the latest version at the time of writing this training package was 19 November 2020. Relevant information includes:
  - Definition of "Security Work" and "Security Device" (https://www.sb.gov.hk/eng/links/sgsia/howto-spp.html)
  - Categories of "Security Work" (https://www.sb.gov.hk/eng/links/sgsia/howto-

spp.html)
  - How to apply for a Security Personnel Permit (https://www.sb.gov.hk/eng/links/sgsia/howto-spp.html)
  - Criteria for issuing a Security Personnel Permit (https://www.sb.gov.hk/eng/links/sgsia/pdf/GN%20-%20Criteria%20for%20Security%20Personnel%20Permit%20(Eng).pdf)

- "Electricity Ordinance" (Laws of Hong Kong, Cap. 406) (must be the latest version); downloadable free of charge from the Hong Kong e-Legislation website (https://www.elegislation.gov.hk/); the latest version at the time of writing this training package was 10 December 2020

- Registering as an Electrical Worker for Electrical Work (must be the latest version); downloadable from the website of the Electrical and Mechanical Services Department (https://www.emsd.gov.hk/en/electricity_safety/how_to_apply/registering_as_an_electrical_worker_for_electrical/index.html); the latest version at the time of writing this training package was 1 December 2020

- "Factories and Industrial Undertakings Ordinance" (Laws of Hong Kong, Cap. 59) in relation to the safety and health protection to workers in the construction site (must be the latest version); downloadable free of charge from the website of Labour Department (https://www.labour.gov.hk/eng/legislat/content3.htm); the latest version at the time of writing this training package was 19 December 2017

- "Construction Sites (Safety) Regulations (Cap. 59 Section 7) (must be the latest version); downloadable free of charge from the Hong Kong e-Legislation website (https://www.elegislation.gov.hk/hk/cap59I!en?INDEX_CS=N&xpid=ID_1438403505486_003); the latest version at the time of writing this training package was 1 January 2008) in relation to the following sections:
  - Part VA Scaffoldings, Work Platforms and Ladders, etc.
  - Part VII Miscellaneous Safety Rules

Topic: “Project management roles and responsibilities and site culture”

Teaching Guidelines

Intended Learning Outcomes

Upon completion of this lesson, it is expected that learners will understand the roles and responsibilities of project management and the culture, practices, and protocols at a construction site; thereby promoting cooperation with working partners.

Contact Hours

It is recommended that the contact hours for this lesson should be not more than 0.5 hour.

Self-study Guidelines for Learners

Not applicable

Suggested Scope, Contents and Materials

It is recommended that the lesson should focus on the following two areas:

- Project management roles and responsibilities
  Including:
  - Client
  - Project Manager
  - Consultant
  - Main Contractor
  - Electrical Contractor
  - Security System Contractor and the roles under him, including:
    - Project Manager for overall management
    - Project Engineer for design and technical issues
    - Site Supervisor for scheduling of work
    - Site Workers for actual installation work
  - Relevant government departments

- Construction site culture, practices, and protocols
  Including:
  - Participate in site meetings where possible
  - Get to know the site supervisors of various contractors as soon as the project starts

- Confirm sign-off and safe storage arrangements for materials
- Be consultative rather than confrontational when there are conflicts in work schedule
- Always aim at satisfying the needs of key stakeholders (such as clients, project management and consultant)
- Inform the key stakeholders in writing if the final acceptance dated is affected by site problems
- How to deal extra work outside the agreed scope
- Photograph and record work injuries as soon as possible

Assessment Guidelines

Assessment Mode

Multiple Choice Questions

Scope of Assessment

Sample Question	Model Answer
Which of the following is not right for project management? A） Complete all the client's requests B） Participate in site meetings where possible C） Maintain good relationship with various site supervisors D） Store materials delivered to site at safe locations E） All the above answers are incorrect	A

Marking Rubrics

To be able to select the Model Answer

List of Training Aids

- No suggestions

References

(Remark: These references are intended for trainers. Their scope may exceed the depth and breadth of relevant topics in the UoC. Training institutions should tailor the materials to suit the needs and abilities of the learners if they decide to adopt them as training materials for the use of the Learners. Copyrights should also be observed. Some of the References may not provide Chinese translation of the materials. Training institutions should translate the materials for the use of the Learners where necessary.)

- “Factories and Industrial Undertakings Ordinance” (Laws of Hong Kong, Cap. 59) in relation to the safety and health protection to workers in the construction site (must be the latest version); downloadable free of charge from the website of Labour Department (https://www.labour.gov.hk/eng/legislat/content3.htm); the latest version at the time of writing this training package was 19 December 2017

- “Construction Sites (Safety) Regulations (Cap. 59 Section 7) (must be the latest version); downloadable free of charge from the Hong Kong e-Legislation website (https://www.elegislation.gov.hk/hk/cap59I!en?INDEX_CS=N&xpid=ID_1438403505486_003); the latest version at the time of writing this training package was 1 January 2008)

Topic: “Occupational safety and health at the installation site”

Teaching Guidelines

Intended Learning Outcomes

Upon completion of this lesson, it is expected that learners will understand matters, personal safety measures and site rules relevant to occupational safety and health at an installation site.

Contact Hours

It is recommended that the contact hours for this lesson should be not more than 0.5 hour.

Self-study Guidelines for Learners

Not applicable

Suggested Scope, Contents and Materials

It is recommended that the lesson should focus on the following three areas:

1. Matters related to occupational safety and health at a construction site
   Including:
   - Requirements associated with Green Card (Construction Work)
   - Equipment for working at height, including:
     - Use of light-duty working platform
     - Use of mobile-working platform

2. Personal safety measures
   Including:
   - Safety helmets
   - Safety shoes
   - Reflective vests

3. Common rules at a construction site
   Including:
   - Site rules are generally set by the Main Contractor
   - They may include:
     - Measure body temperature and sanitize the h and s before entering the site
     - Sign IN and OUT on the logbook
     - Do not use foul languages
     - Do not gamble on site

- Do not sleep on site
- Follow designated delivery routes
- Observe hours for general work
- Observe hours for noisy work
- Observe measures for waste disposal
- Keep the site clean
- Wear personal protective gears

4. Power Supply Need-to-Know
   Including:
   - General power supply arrangements for security systems and devices
     - Low voltage 220VAC input
     - Extra-low voltage 12VDC output
     - Backup power terminations
   - Use of electrical test pen

Assessment Guidelines

Assessment Mode

Multiple Choice Questions

Scope of Assessment

Sample Question	Model Answer
Which of the following is a personal safety gear? A） Safety helmet B） Safety shoes C） Reflective vest D） Goggle E） All the above answers are correct	E

Marking Rubrics

To be able to select the Model Answer

List of Training Aids

- Safety helmet sample
- Safety shoes sample
- Reflective vest sample

References

(Remark: These references are intended for trainers. Their scope may exceed the depth and breadth of relevant topics in the UoC. Training institutions should tailor the materials to suit the needs and abilities of the learners if they decide to adopt them as training materials for the use of the Learners. Copyrights should also be observed. Some of the References may not provide Chinese translation of the materials. Training institutions should translate the materials for the use of the Learners where necessary.)

- Occupational Safety and health – Safety Training https://www.labour.gov.hk/eng/faq/oshq4_whole.html
- Occupational Safety & Health Council – Work at Height https://www.oshc.org.hk/eng/main/hot/work_at_height/index.html
- Occupational Safety & Health Council – Safe Use of Light-duty Working Platform and Mobile Working Platform http://www.oshc.org.hk/oshc_data/files/HotTopic/CB1488C.pdf
- Occupational Safety & Health Council – accessories and functions of safety helmets http://www.oshc.org.hk/oshc_data/files/bulletins/ibsh/2017/Construction_Bulletin_Issue49.pdf
- Occupational Safety & Health at Work DIY – correct selection of safety shoes http://www.oshc.org.hk/oshc_data/files/greencross/2020/202007 安全鞋.pdf
- Electrical and Mechanical Services Department – Guidance Notes for the Electrical Products (Safety) Regulation (2019 Edition) https://www.emsd.gov.hk/filemanager/en/content_444/GN-ElectricalProductsSafetyRegulation2019.pdf

Topic: “Installation progress management”

Teaching Guidelines

Intended Learning Outcomes

Upon completion of this lesson, it is expected that learners will understand the requirements in relation to installation progress management.

Contact Hours

It is recommended that the contact hours for this lesson should be not more than 1 hour.

Self-study Guidelines for Learners

Not applicable

Suggested Scope, Contents and Materials

It is recommended that the lesson should focus on the following five areas:

1. Work Schedule
   Key Points:
   - Common format and content of a Work Schedule
   - The overall Work Schedule is set by the Project Manager (from start to finish)
   - The schedule of security work is often included in the schedule of the Electrical Contractor
   - A Security Contractor should strive to get reasonable time for completing the security work, including:
     - Confirmation of the scope of work
     - Drawings preparation
     - Cabling containment
     - Cable installation
     - Backend installations
     - Frontend installations
     - Testing
     - Acceptance

2. Delivery Schedule
   Key Points:

- Long lead time equipment management
- Replacement arrangements when out of stock

3. Manpower Scheduling
   Key Points:
   - The Project Manager is responsible for completion of the Security Contractor’s overall scope of work
   - The Project Engineer is responsible for technical and drawing matters
   - The Site Supervisor is responsible for scheduling of work on site
   - The site workers or sub-contractors are responsible for installation according to the drawings

4. Progress Reporting
   Key Points:
   - Normally once a week
   - Important notifications and actions regarding issues that impact on the acceptance date
   - Work completed in the week
   - Diagrams about work completed
   - Overall progress
   - Work scheduled for the coming week
   - Status of delivery of equipment
   - Quotation List (including original scope, confirmed variation orders and variation orders pending confirmation)

5. Exception Reporting
   Key Points:
   - As required
   - Quality issues
   - Accidental injuries
   - Problematic conducts of individual personnel
   - Safety breaches
   - Damage of finished work

Assessment Guidelines

Assessment Mode

Multiple Choice Questions

Scope of Assessment

Sample Question	Model Answer
Which of the following is required to be included in Progress Reporting? A) Attendance of construction site meetings B) Overall progress C) Delay in deliveries that will affect the date of acceptance D) Answers at B and C are correct E) All the above answers are correct	D

Marking Rubrics

To be able to select the Model Answer

List of Training Aids

- No suggestions

References

(Remark: These references are intended for trainers. Their scope may exceed the depth and breadth of relevant topics in the UoC. Training institutions should tailor the materials to suit the needs and abilities of the learners if they decide to adopt them as training materials for the use of the Learners. Copyrights should also be observed. Some of the References may not provide Chinese translation of the materials. Training institutions should translate the materials for the use of the Learners where necessary.)

- The Fast Forward MBA in Project Management (4th Edition) by Eric Verzuh

- "Factories and Industrial Undertakings Ordinance (Laws of Hong Kong, Cap. 59)" in relation to the safety and health protection to workers at construction sites (must be the latest version); downloadable free of charge from the website of Labour Department (https://www.labour.gov.hk/eng/legislat/content3.htm); the latest version at the time of writing this training package was 19 December 2017.

- Construction Sites (Safety) Regulations (Cap. 59 Section 7) (must be the latest version); downloadable free of charge from the website of Hong Kong e-Legislation; the latest version at the time of writing this training package was 1 January 2008 (https://www.elegislation.gov.hk/hk/cap59I!en?INDEX_CS=N&xpid=ID_1438403505674_001)

Topic: “Basic knowledge of low voltage and extra low voltage”

Teaching Guidelines

Intended Learning Outcomes

Upon completion of this lesson, it is expected that learners will acquire the basic knowledge about low voltage and extra low voltage and license requirements when engaging in work associated with them.

Contact Hours

It is recommended that the contact hours for this lesson should be not more than 0.5 hour.

Self-study Guidelines for Learners

Not applicable

Suggested Scope, Contents and Materials

It is recommended that the lesson should focus on the following seven areas:

1. According to the “Electricity Ordinance” (Cap. 406),
    - "Low voltage” means voltage normally exceeding extralow voltage but normally not exceeding between conductors, 1,000V root mean square alternating current or 1,500V direct current; or between a conductor and earth, 600V root mean square alternating current or 900V direct current.

    Electrical work involving low-voltage conductors must be carried out by a qualified person who holds a valid Class A certificate (commonly known as: A license). An example would be the connection of a Fused Spur Unit to the 220V AC Input Terminal of the system power supply.

2. According to the “Electricity Ordinance” (Cap. 406),
    - “Extra-low voltage” means voltage normally not exceeding 50V root mean square alternating current or 120V direct current, between conductors or between a conductor and earth.

    Electrical work involving extra-low voltage conductors will not pose any danger to personnel who is in contact with them. An example would be the connection of the 12 VDC Output Terminal of a system power supply device with the 12 VDC Input Terminal of the electronic board of an access control system.

3. Low voltage and extra low voltage cables cannot share the same cable containment otherwise there will be interferences resulting in malfunctions of the security systems and devices.

4. The function of resistors and the relationship between resistor (R), voltage (V) and current (I)
    - Ohm’s Law: V=IR
    - Resistors are used to reduce current flow and divide voltages in circuits
    - At a given voltage, higher resistance values result in lower current
    - Series circuit and parallel circuit

5. Reading Resistor 4-band colour code – the colour band on a resistor shows its resistance value
    - B and s in the colour of Black, Brown, Red, Orange, Yellow, Green, Blue, Violet, Grey and White on the body of resistors indicate its resistance value in digits of 0 – 9 respectively
    - The first and second b and s represent digits in the value of resistance
    - The third band is the multiplier
    - The fourth band represents error (in gold or silver)

6. Introduce the correct method to use voltmeters to measure voltage

7. Both access control systems and intrusion detection alarm systems require terminal resistors to detect malicious damage to the signal lines. The system circuit diagram provided by the manufacturer will indicate the quantity and location of the resistors. Under normal circumstances, the installer is only required to install according to the manufacturer's circuit diagram.

Assessment Guidelines

Assessment Mode

Multiple Choice Questions

Scope of Assessment

Sample Question	Model Answer
Which of the following is the correct formula of Ohm's Law? A) V＝I/R B) R＝VI C) V=IR D) I＝R/V E) All the above answers are incorrect	C

Marking Rubrics

To be able to select the Model Answer

List of Training Aids

- No suggestions

References

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- Factories and Industrial Undertakings (Electricity) Regulations (Cap. 59W) https://www.elegislation.gov.hk/hk/cap59W!en@2012-07-27T00:00:00?INDEX_CS=N
- Registering as an Electrical Worker for Electrical Work https://www.emsd.gov.hk/en/electricity_safety/how_to_apply/registering_as_an_electrical_worker_for_electrical/
- What are resistors? – basic knowledge https://www.rohm.com.tw/electronics-basics/resistors/r_what1
- Resistor Color Code Guide https://neurophysics.ucsd.edu/courses/physics_120/resistorcharts.pdf

Topic: “Installation quality and standard”

Teaching Guidelines

Intended Learning Outcomes

Upon completion of this lesson, it is expected that learners will understand the basic principles and relevant installation standards of premises security systems.

Contact Hours

It is recommended that the contact hours for this lesson should be not more than 1 hour.

Self-study Guidelines for Learners

Not applicable

Suggested Scope, Contents and Materials

It is recommended that the lesson should focus on the following three areas:

1. Basic principles
   - Neat and clean
   - Safe and secure
   - Clearly labelled

2. Standards are set by the management of a company

   - The supplier will provide installation instructions detailing the installation standards and the installation methods that will maximize the performance of each device

   - Other common standards, e.g.
     - Intrusion detection sensors must be installed with terminal resistors in the central control unit to detect wire cutting or short circuits
     - The key switch of the electric lock of an access control system must be fixed with anti-dismantling screws
     - Power supply
       - At least 2 hours of backup power supply
       - Backup batteries must be labelled with the date of installation
     - Frontend devices must be installed securely
     - The cable containers must have at least 25% of spare space
     - Extra-low voltage cables

  - Shall not share the same cable containment with cables of other voltages
  - Shall keep away from cables of other voltages as much as possible
- Cables inside backend enclosures
  - Must be protected by cable trays
  - Should only be laid around but not over an electronic panel
- Cables of backend control panels
  - Must be pinned and capped
  - Must be clearly labelled
- The wiring inside a server rack must be neatly arranged
- Water-proof containers must be used in outdoor areas
- All electronic panels must be grounded
- The terminal soft conduits must be not more than 0.5 meter long
- Layout diagrams and system diagrams should be displayed at safe and easily seen locations

3. All personnel involved in installation must be trained by the company and relevant manufacturers.

Assessment Guidelines

Assessment Mode

Multiple Choice Questions

Scope of Assessment

Sample Question	Model Answer
Which of the following is responsible for setting installation quality and standard? A）Management B）Project Manager C）Workers D）Project Engineer E）All the above answers are incorrect	A

Marking Rubrics

To be able to select the Model Answer

List of Training Aids

- No suggestions

References

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- NFPA 731 "Standard for the Installation of Premises Security Systems"
- BS 4737 series "Intruder alarm systems. Specifications for components"
- BS EN 50131 series "Alarm systems. Intrusion and hold-up systems"
- BS EN 62676 series "Video Surveillance Systems for Use in Security Applications"
- BS EN 60839 series "Alarm and electronic security systems. Electronic access control systems"

Topic: “Basic diagrams related to the installation of premises security systems”

Teaching Guidelines

Intended Learning Outcomes

Upon completion of this lesson, it is expected that learners will understand the diagrams associated with the installation of premises security systems and will be able to perform installation work according to the diagrams accurately.

Contact Hours

It is recommended that the contact hours for this lesson should be not more than 2 hours.

Self-study Guidelines for Learners

Not applicable

Suggested Scope, Contents and Materials

It is recommended that the lesson should focus on the following six areas. The Trainer should show various diagrams to the learners, explain in detail their purposes and how to interpret them to ensure that installation work can be carried out accurately according to the diagrams.

1. Diagrams are usually prepared by the Project Engineer

2. Importance of diagrams
    - To picturize the scope of work
    - To facilitate effective communication of parties involved in a project
    - To facilitate workers to complete their work accurately

3. Layout diagrams, purposes and how to interpret them
    - To mark the actual location of devices
    - To calculate the types and quantity of devices to be installed

4. Wiring diagrams, purposes and how to interpret them
    - To provide the methods of connecting the cables
    - To provide other ancillary parts associated with cables such as the location and resistance value of the terminal resistors

5. Conduit diagrams, purposes and how to interpret them
    - To mark the actual location and routes of the conduits and trunks

6. Schematic diagrams, purposes and how to interpret them
    - To show the inter-relationship of system components
    - To show the location of the network addresses and routers

Assessment Guidelines

Assessment Mode

Multiple Choice Questions

Scope of Assessment

Sample Question	Model Answer
Which of the following is the reason for diagrams to be able to assist in the completion of a project? A）Facilitate the effective communication of the personnel involved in the project B）Facilitate the accurate completion of work by the workers C）Picturize the scope of work D）All the above answers are correct E）All the above answers are incorrect	D

Marking Rubrics

To be able to select the Model Answer

List of Training Aids

- Samples of various diagrams

References

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- No suggestions

Topic: “Common types of security devices, purposes, and installation methods”

Teaching Guidelines

Intended Learning Outcomes

Upon completion of this lesson, it is expected that learners will learn about common types of security devices associated with premises security systems, their purposes and installation methods.

Contact Hours

It is recommended that the contact hours for this lesson should be not more than 3 hours.

Self-study Guidelines for Learners

Not applicable

Suggested Scope, Contents and Materials

It is recommended that the lesson should focus on the following three areas:

1. Common types of intrusion detection alarm systems, devices, purposes, and installation methods

   Including:
   - Common devices:
     - Infrared motion sensors
     - Magnetic contact sensors
     - Panic alarm buttons
   - Purposes: detection of foreseeable intrusions identified in risk assessment
   - Installation method should be according to the manufacturer’s installation instructions
   - System panels should be installed at areas protected by the alarm system
   - Line integrity of the sensors should be ensured by installing terminal resistors to monitor the wirings end to end
   - System integrity should be ensured by monitoring the system communication lines end to end

2. Common types of video recording systems, devices, purposes, and installation methods

   Including:
   - Common devices:
     - CCTV cameras
     - Network cameras
     - Network routers
     - Video recorders
   - Purposes: monitoring foreseeable intrusions identified in risk assessment
   - Installation methods should be according to the manufacturer’s installation instructions
   - Camera focus, angle, and focal length (if adjustable) should be adjusted to achieve a clear resolution and cover the range requiring monitoring as specified in the diagrams
   - Network routers should be installed inside secured areas
   - Video recorders should be installed inside secured areas

3. Access control systems, devices, purposes, and installation methods

   Including:
   - Common devices:
     - Credential readers (aka card readers)
     - Door contacts
     - Release to exit buttons
     - Breakglass units
   - Purposes: detection of foreseeable intrusions identified in risk assessment
   - Installation methods should be according to the manufacturer’s installation instructions
   - Credential readers should be installed at:
     - Around 1.2 meters above ground and at waist height
     - Near to the exit that it covers
     - Reserve space for repair, e.g. screws should not be blocked by other device
   - Door contacts
     - Should be
       - Conceal-mounted within the door frame; or
       - Surface-mounted high on the secured side
     - Each door leaf should be installed with its own door contact
     - If the door is of a relatively large size (e.g. a tall sliding door), consider installing more than one pair of door contacts and connect them in parallel to reduce the chances of false alarms

- Release to exit buttons should be installed:
  - Around 1.2 meter above ground and at waist height
  - Near to the exit it covers
- Breakglass units should be installed:
  - Around 1.2 meter above ground and at waist height
  - Near to the exit it covers
  - The devices should be easily seen in an emergency and therefore their colour should be avoided to be the same or similar to that of other devices (e.g. fire alarm) or that of the background. It is normally more appropriate to have them in green and blue.

Assessment Guidelines

Assessment Mode

Multiple Choice Questions

Scope of Assessment

Sample Question	Model Answer
Which of the following are common types of devices for access control systems? A）Card readers B）Door contacts C）Electric locks D）Push bars E）All the above answers are correct	E

Marking Rubrics

To be able to select the Model Answer

List of Training Aids

- No suggestions

References

(Remark: These references are intended for trainers. Their scope may exceed the depth and breadth of relevant topics in the UoC. Training institutions should tailor the materials to suit the needs and abilities of the learners if they decide to adopt them as training materials for the use of the Learners. Copyrights should also be observed. Some of the References may not provide Chinese translation of the materials. Training institutions should translate the materials for the use of the Learners where necessary.)

- NFPA 731 Standard for the Installation of Premises Security Systems
- BS 4737 series “Intruder alarm systems. Specifications for components”
- BS EN 50131 series “Alarm systems. Intrusion and hold-up systems”
- BS EN 62676 series “Video Surveillance Systems for Use in Security Applications”
- BS EN 60839 series “Alarm and electronic security systems. Electronic access control systems

Topic: “Common types and installation methods of electric locks and adjustment of door closers”

Teaching Guidelines

Intended Learning Outcomes

Upon completion of this lesson, it is expected that learners will understand the types of electric locks and their basic installation methods, door closers and air pressure.

Contact Hours

It is recommended that the contact hours for this lesson should be not more than 1 hour.

Self-study Guidelines for Learners

Not applicable

Suggested Scope, Contents and Materials

It is recommended that the lesson should focus on the following two areas:

1. Types and purposes of electric locks

   Purposes: keeping doors at close position for access control systems

   There are two main types:
   - Conceal mount (strike locks and mortise locks）
   - Surface mount (magnetic locks)

2. Functions of door closers, how to adjust them and their relationship with electric locks

   Key Points:
   - Door closers are normally supplied by the Door Supplier together with doors
   - In an indoor environment, doors sometimes cannot be closed properly without external force due to the existence of incoming fresh air and return air of the air-conditioning system. Adjusting the door closers is one way to resolve this issue.
   - Most door closers are designed with a two-tiered closing force. The aim of adjusting a door closer is to achieve the appropriate force to keep a door close under the given environment.

- Door closers are important since they affect whether doors can be kept at closing position by the electric locks for access control.
- The functions of a door closer:
  - To close a door automatically
  - To prevent the closing force of a door from physically straining the electric lock
  - To keep the closing of a door at a safe and appropriate speed
  - To allow the electric lock to successfully secure a door after closure

Assessment Guidelines

Assessment Mode

Multiple Choice Questions

Scope of Assessment

Sample Question	Model Answer
Which of the following type of electric locks does not lock a door by mechanical locking force? A）Strike lock B）Mortise lock C）Magnetic lock D）Pushbar lock E）All the above answers are incorrect	C

Marking Rubrics

To be able to select the Model Answer

List of Training Aids

- No suggestions

References

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- NFPA 731 Standard for the Installation of Premises Security Systems

Topic: “Types of cables and methods for connecting and laying cables”

Teaching Guidelines

Intended Learning Outcomes

Upon completion of this lesson, it is expected that learners will learn about the types of cables, connectors and the methods for connecting and laying cables.

Contact Hours

It is recommended that the contact hours for this lesson should be not more than 1 hour.

Self-study Guidelines for Learners

Not applicable

Suggested Scope, Contents and Materials

It is recommended that the lesson should focus on the following seven areas:

1. The selection of cables and cable connectors must be based on the specifications of a device.

2. Each company has its own practices, the following is a generic principle:
    - The larger the cable core’s diameter (unit: AWG，mm2), the lower the resistance value. Under the same voltage, the lower the resistance value, the higher the maximum effective distance.
    - Twisted pair cables can make positive and negative voltages counteract each other, resulting in no interference. The more cables inside a conduit, the advantage of having twisted pair cables is more apparent.
    - Extra-low voltage cables should be far away from cables of other voltages. Where possible, designated containers should be set up for the cables of security systems. This will ensure the reliable performance of security systems.
    - Cables should be protected by way of cable containment.
    - At outdoor or semi-outdoor environments, surface mount conduits and junction boxes should be made of metallic materials.

3. Card reader cables
    - Wiegand format: Generally, 4 to 8 core cables
    - Open Surveillance Device Protocol (OSDP): Generally, 4 core cable
    - The end of wires should be pinned and secured to the termination block

4. Electric lock cables
    - Generally, 2 core cable (＞＝1 mm2)
    - Connecting low voltage cables (220VAC) to the transformer (generally, 220VAC to 12VDC) must be carried out by a qualified person holding a Class A certificate

5. Network cables
    - CAT5E cables
    - Plug RJ45 cable connectors into network routers with RJ45 ports

6. Analog cameras
    - Coaxial cables
    - BNC connectors

7. Other signals (sensors, door contacts, etc.)
    - Generally, 4 core cable
    - The end of wires should be pinned and secured to the termination block

Assessment Guidelines

Assessment Mode

Multiple Choice Questions

Scope of Assessment

Sample Question	Model Answer
Which of the following are affected by the size of the cable core? A）Wire resistance B）Wire terminal voltage C）Wire maximum effective distance D）All the above answers are correct E）All the above answers are incorrect	D

Marking Rubrics

To be able to select the Model Answer

List of Training Aids

- Samples or photographs of various cables

References

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- NFPA 731 Standard for the Installation of Premises Security Systems
- BS 4737 series “Intruder alarm systems. Specifications for components”
- BS EN 50131 series “Alarm systems. Intrusion and hold-up systems”
- BS EN 62676 series “Video Surveillance Systems for Use in Security Applications”
- BS EN 60839 series “Alarm and electronic security systems. Electronic access control systems

Topic: “Types of cable containers, purposes and installation methods”

Teaching Guidelines

Intended Learning Outcomes

Upon completion of this lesson, it is expected that learners will learn about various types of cable containers, their purposes and installation methods.

Contact Hours

It is recommended that the contact hours for this lesson should be not more than 1 hour.

Self-study Guidelines for Learners

Not applicable

Suggested Scope, Contents and Materials

It is recommended that the lesson should focus on the following eight areas:

1. Cable Conduits
   Purposes: to protect the cables
   (Remark: introduce various types of pipes and their application, including soft PVC pipes, hard PVC pipes and metal pipes)

   Soft PVC conduit

   

   20- or 25-mm hard PVC conduit

   

   Metal conduit

   

2. Junction Boxes
   Purposes: to protect cables and change the direction of conduit

3. Cable Trunking
   Purposes: to protect cables, group cables together and reduce electronic interferences

4. Threaded Rods
   Purposes: to provide hanging force from the ceiling for cable containers

5. Cable Trays
   Purposes: to protect cables and arrange them neatly; usually used inside the metal enclosures of backend control panels

6. Vertical / Inter-floor Cables
   - They are not a specific type of cable. They are cables that go across floors for security devices at different floors to communicate with each other.
   - Vertical / Inter-floor cables can be network cables or fibre-optic cables.

7. Electric Panel Metal Enclosure
   Purposes: to protect cables and backend control panels

8. Server Rack
   Purposes: to protect video records or network routers

(Remark:

- In new build projects, cable containers are normally installed by the Electrical Contractor. The Security Contractor will specify the cable containment requirements and lay the cables.
- In alteration / addition projects, cable containers may be installed by the Electrical Contractor. If the scale of work is small, the Security Contractor may also be responsible for cable containment.

Assessment Guidelines

Assessment Mode

Multiple Choice Questions

Scope of Assessment

Sample Question	Model Answer
Which of the following are affected by the size of the cable core? A） Wire resistance B） Wire terminal voltage C） Wire maximum effective distance D） All the above answers are correct E） All the above answers are incorrect	D

Marking Rubrics

To be able to select the Model Answer

List of Training Aids

- Photographs of various types of cable containers

References

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- NFPA 731 Standard for the Installation of Premises Security Systems

Topic: “Common installation tools and practical exercises”

Teaching Guidelines

Intended Learning Outcomes

Upon completion of this lesson, it is expected that learners will learn about common installation tools and their usages, and practise how to install security devices.

Contact Hours

It is recommended that the contact hours for this lesson should be not more than 5 hours.

Self-study Guidelines for Learners

Not applicable

Suggested Scope, Contents and Materials

It is recommended that the lesson should focus on the following two areas:

1. Common installation tools and their usages

   Including:

   - Voltmeters and their usages

     

     - Demonstrate and let learners practise using voltmeters
       - To measure resistance
       - To measure voltage
       - To measure current
       - To measure short circuit

   - Cable pullers and their usages

- Demonstrate and let learners practise:
  - Prepare a 5-meter long 25mm hard PVC conduit and practise pulling a CAT5E cable through it

- Crimp tools and their usages

- Demonstrate and let learners practise:
  - Prepare a 4-core cable and practise stripping off the protective coats until the copper wires inside are exposed

- Crimp tools and RJ45 connectors and their usages

- Demonstrate and let learners practise:
  - Prepare a CAT5E cable and RJ45 connector and practise connecting the cable to the connector according to T568A wiring standard

- Crimp Tools and BNC connectors and their usages:

- Demonstrate and let learners practise:
  - Prepare a RJ59 cable and BNC connector and practise connecting the cable to the connector

- Wire Pins and their usages

  - Demonstrate and let the learners practise:
    - Prepare a 4-core cable and practise capping the wires with wire pins using pliers

- Soldering iron and solder and their usages

  - Demonstrate and let learners practise:
    - Prepare two pieces of 4-core cable and practise soldering them together permanently with soldering irons and solder

2. Practise the installation of security devices

   The Trainer should explain and demonstrate how to install the security devices and then let the learners practise.

   Including:

   - Intrusion detection alarm system
     - Prepare training aids according to the selected brand of system, e.g.
       - 1 infrared sensor (intrusion detection)
       - 1 pair of surface mount door contacts (intrusion detection)
       - 1 buzzer (raising alarm)
       - Metal enclosure
       - System panel
       - Cables
       - Power supply
     - Cable containers (quantity to be decided by the Trainer), e.g.
       - 25mm hard PVC conduit
       - Junction box
     - Diagrams
       - System diagrams
       - Wiring diagrams

- Objectives: train learners to install devices and cable containers onto a wooden board according to the diagrams
- Standards to be achieved: the system can detect intrusions and raise alarms.

- Video recording and CCTV surveillance system
  - Prepare the training aids depending on the selected brand of system, e.g.
    - 1 network camera
    - 1 network router
    - 1 video recorder
    - Cables
    - Power supply
  - Cable containers (quantity to be decided by the Trainer), e.g.
    - 25mm hard PVC cable
    - Junction box
  - Diagrams
    - System diagrams
    - Wiring diagrams
  - Objectives: let learners practise installing devices and cable containers on a wooden board
  - Standards to be achieved: the system can record and play back the videos

- Access Control System
  - Prepare training aids according to the selected brand of system, e.g.
    - 1 electronic access card
    - 1 card reader
    - 1 pair of surface mount door contacts
    - 1 release to exit button
    - 1 breakglass unit
    - 1 surface mount magnetic lock
    - 1 buzzer
    - Metal enclosure
    - System panel
    - Cables
    - Power supply
  - Cable containers (quantity to be decided by the Trainer), e.g.
    - 25mm hard PVC conduit
    - Junction Box
  - Diagrams
    - System diagrams
    - Wiring diagrams
  - Objectives: let learners practise installing system devices and cable containers on a wooden board according to the diagrams

- Standards to be achieved:
  - The electronic access card can unlock
  - The release to exit button can unlock
  - The breakglass unit can unlock
  - The buzzer can raise alarm when forced intrusion is simulated by cutting the power supply

Remark:

1. Process
   - It is recommended that the Trainer should group the learners into not more than 5 persons per group and let each learner practise the assigned tasks until the standards are achieved.
   - During the exercise, the Trainer should move around and check the performance of the learners and instruct and correct their actions where necessary.

2. Objectives
   Through the practical exercises, the learners will:
   - Practise how to use the installation tools
   - Practise how to install the security devices
   - Enhance their understanding about factors to be considered when installing security devices

3. Exercise environment and facilities
   It is recommended that the Trainer should:
   - Provide work benches suitable for group work
   - Provide not less than 6 sets of tools, materials, and diagrams for the practical exercises

4. Assessment Guidelines and Records
   - Each group of learners must perform exercises about the installation of intrusion detection alarm system, video recording and CCTV surveillance system, and access control system. The full mark will be 30 scores with 10 scores assigned for each system.
   - When installing a system, learners who successfully achieve the required standards, will be given 10 scores at first try and thereafter 5 scores.
   - Upon completion, the installation of each system by each learner, whether the standards are achieved or not, must be assessed by the Trainer and the finished work must be photographed for record purpose.
   - It is suggested that award of scores should be based on whether the installation is successful or not (i.e. pass or fail). To provide learners with more specific guidance and feedback, the Trainer may set up more detailed criteria and assessment indicators depending on the nature of each exercise.

Assessment Guidelines

Assessment Mode

Multiple Choice Questions

Scope of Assessment

Sample Question	Model Answer
Which of the following is the usage of a voltmeter? A） For connecting to RJ45 connector B） For connecting cables C） For measuring short circuit D） For stripping cables E） All the above answers are incorrect	C

Marking Rubrics

To be able to select the Model Answer

List of Training Aids

- Various toold and devices required for the practical exercises

References

(Remark: These references are intended for trainers. Their scope may exceed the depth and breadth of relevant topics in the UoC. Training institutions should tailor the materials to suit the needs and abilities of the learners if they decide to adopt them as training materials for the use of the Learners. Copyrights should also be observed. Some of the References may not provide Chinese translation of the materials. Training institutions should translate the materials for the use of the Learners where necessary.)

- Security Installation Tools Guide (https://ipvm.com/reports/installer-tools-guide)

Section 3: Self-study Guidelines for Learners

Intended Learning Outcomes

Upon completion of self-study, learners will understand relevant knowledge and can apply what they have learned in class discussions.

Hours of Self-study and Time of Completion

It is recommended that self-study should be no less than 2 hours and should be completed before the start of the relevant class.

Scope of Self-study, Contents and Suggested Materials

The contents for self-study are extracted from government websites and described in detail in the respective topic in Section 2. They are summarized below:

Topic: "Relevant laws and license requirements"- self-study in respect of the following areas:

Relevant Materials	**Website Addresses**
• "Security and Guarding Services Ordinance" (Laws of Hong Kong, Cap. 460)	
➢ The Security and Guarding Services Industry Authority is established under the "Security and Guarding Services Ordinance" (Laws of Hong Kong, Cap. 460) to regulate the security industry. What are its key functions?	https://www.sb.gov.hk/eng/links/sgsia/index.html
➢ Definitions of "Security Work" and "Security Device"	https://www.sb.gov.hk/eng/links/sgsia/howto-spp.html
➢ Categories of "Security Work"	
➢ Application Procedures of a Security Personnel Permit	
➢ Which category of "Security Work" does the "installation of premises security systems" belong to?	https://www.sb.gov.hk/eng/links/sgsia/spp.html
➢ What are the criteria that one must meet when applying for a security personnel permit for providing services in relation to "installation, maintenance and /or repairing of a security device and /or designing (for	https://www.sb.gov.hk/eng/links/sgsia/pdf/GN%20-%20Criteria%20for%20Security%20Personnel%20Permit%20(Eng).pdf

any particular premises or place) a system incorporating a security device"?	
• "Electricity Ordinance" (Laws of Hong Kong, Cap. 406)	
➢ All workers engaged in electrical work on fixed electrical installations must be registered with the Electrical and Mechanical Services Department (EMSD). The purpose is to ensure that such work is carried out only by qualified electrical workers.	https://www.emsd.gov.hk/en/electricity_safety/how_to_apply/registering_as_an_electrical_worker_for_electrical/index.html
➢ What does "electrical work" mean?	
➢ What are fixed electrical installations?	
➢ Persons engaged in work on which type of electrical appliances are not required to be registered?	
➢ There are five grades of certificates of registration. What are the requirements in qualifications, training and experience in each grade?	
• "Factories and Industrial Undertakings Ordinance" (Laws of Hong Kong, Cap. 59)	
➢ The purpose of the "Factories and Industrial Undertakings Ordinance"	https://www.labour.gov.hk/eng/legislat/content3.htm
➢ The coverage	
➢ "Construction Sites (Safety) Regulations" (Cap.59 Section 7) requirements in relation to the following sections: ▪ Part VA Scaffolds, Working Platforms and Ladders, etc. ▪ Part VII Miscellaneous Safety Requirements	https://www.elegislation.gov.hk/hk/cap59I!en?INDEX_CS=N&xpid=ID_1438403505486_003