Unit 018/602: Understand the requirements for electrical installations BS 7671: 2018

Sample scheme of work

This sample scheme of work covers classroom-based learning for Unit 018/602. It is based on 2 hours per session for 17 sessions. It is an example only of a possible scheme of work and is based on the requirements of The IET Wiring Regulations BS 7671: 2018.

Unit 016/602 is designed as a standalone unit and should be used in conjunction with the standards set for the qualification to ensure full coverage of the learning requirements.

You can use the sample scheme of work as it is, adjust it or extract content to create a scheme of work to suit your delivery needs. It can also be adjusted by adding theory and practical workshops to support learners who want or need additional learning time.

Reference is made within the scheme of work, in black bold, to **PowerPoints, worksheets, activities and lesson plans** (if they are available on SmartScreen.co.uk) for tutors to use with learners. Any other resources listed are not provided on SmartScreen but provide guidance for the tutor as to others they may produce.

Delivery timings are given; however, these can be amended to suit the group. The content of presentations, discussions, explanations, etc is left to the professionalism of the course tutor.

Centres should also incorporate the following themes, where appropriate, as strands running through each of the sections within the qualification. Although they are not specifically referred to in the section content section, City & Guilds regards these as essential in the teaching of the qualification:

- Health and Safety considerations, in particular the need to impress upon learners the fact that they must preserve the health and safety of others as well as themselves
- Functional Skills (mathematics, English and ICT)
- extension tasks and differentiation, inclusion, entitlement and equality issues
- spiritual, moral, social and cultural issues
- environmental education and related European issues
- Every Child Matters
- Personal learning and thinking skills (PLTS)
- Use of information learning technology (ILT).

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Unit 018/602: Understand the requirements for electrical installations BS 7671: 2018

Sample scheme of work

Course/qualification: _____ **Tutor's name**: _____

Number of sessions: 17 **Delivery hours**: 34 **Venue**: _____ **Group**: _____

Aims of course

To enable learners to:

- gain an understanding of the full content of BS 7671: 2018 and how this applies to electrical installations within its scope.

Session	Objectives/learning outcomes The learner will:	Activities and resources	Assessment criteria
1	**Induction** • Partake in the centre induction process • Be introduced to the course and receive an overview of the contents • Be aware of other courses that are relevant • Understand the final assessment process	• Induction • Introduction to the centre, training environment and facilities, code of conduct, fire drill, health and safety, ice breaker • Aims and objectives **Resources:** Centre induction materials, paperwork Centre course manual	

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Session	Objectives/learning outcomes The learner will:	Activities and resources	Assessment criteria
	Introduction to BS 7671 • Understand the numbering system of BS 7671: 2018 • Be aware of the legal status of BS 7671: 2018 **Understand the scope, object and fundamental principles of BS 7671** • Identify the scope of BS 7671 • Identify the object of BS 7671 • Identify the fundamental principles of BS 7671 **Understand the definitions used within BS 7671** • Identify and interpret definitions • Identify symbols used	• Understand the scope and exclusions. • Know the object and effects of the Regulations. • Understand the fundamental principles. • Identify and interpret definitions. • Identify symbols used. **Activities** Question and answer session (Q&A); general discussion; reference to BS 7671: 2018; centre-devised sample objective questions on Parts 1 and 2. **Resources** Candidate's own copy of BS 7671: 2018 **PowerPoint 1** **Worksheet 1**	Question and answer Discussion on results of objective questions **PowerPoint 1** **Worksheet 1**
2	**Understand how to assess the general characteristics of electrical installations** **Part 3** • Interpret the requirements of assessing the general characteristics of electrical installations within the scope of BS 7671	• Identify the various conductor and earthing arrangements. • Understand why installations need to be divided into circuits. • Identify and understand external influences. • Understand the requirements for compatibility, maintainability and safety services. **Activities** Q&A; general discussion; reference to BS 7671: 2018 Appendices;	Question and answer Discussion on results of objective questions **PowerPoint 2** **Worksheet 2**

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Session	Objectives/learning outcomes The learner will:	Activities and resources	Assessment criteria
		Centre-devised sample objective questions on the Appendices. **Resources** Candidate's own copy of BS 7671: 2018 **PowerPoint 2** **Lesson plan 2** **Worksheet 2**	
3	**Understand the requirements for protection for safety for electrical installations** **Part 4** • Identify the requirements of protection for safety within the scope of BS 7671 • Interpret how this applies to electrical installations within the scope of BS 7671 to include: ○ protection against electric shock ○ protection against thermal effects ○ protection against overcurrent ○ protection against voltage disturbances and electromagnetic disturbances	• Identify the measures for protection against shock. • Understand basic and fault protection. • Understand the principles of automatic disconnection of supply. • Understand disconnection times for TN and TT earthing systems. • Understand the requirements for additional protection by RCDs or supplementary equipotential bonding. **Activities** Q&A; general discussion; reference to BS 7671:2008; centre-devised sample objective questions on Parts 4 **Resources** Candidate's own copy of BS 7671: 2018 **PowerPoint 3** **Worksheet 3** **Activity 3**	Question and answer Discussion on results of objective questions **Worksheet 3** **Activity 3**

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Session	Objectives/learning outcomes The learner will:	Activities and resources	Assessment criteria
4	**Understand the requirements for protection for safety for electrical installations (cont.)** • Protection against electric shock (cont.)	• Understand the need for and the requirements of reduced low voltage systems. • Identify the requirements of protection by double or reinforced insulation. • Identify the requirements and restrictions of protection by electrical separation. • Identify the requirements of protection by SELV and PELV. **Activities** Q&A; general discussion; reference to BS 7671: 2018 Appendices **Activity 4**; centre-devised sample objective questions on the Appendices **Resources** Candidate's own copy of BS 7671: 2018 **Activity 4**	Question and answer Discussion on results of objective questions **Activity 4**
5	**Understand the requirements for protection for safety for electrical installations (cont.)** • Protection against thermal effects • Protection against overcurrent	• Identify the measures used to protect against thermal effects. • Understand the precautions to be taken where particular risks of fire exist. • Understand the need for protection against overcurrent. • Know the difference between overload and fault current. • Understand the relationship between overload and fault current and the breaking capacity of protective devices.	Question and answer Discussion on results of objective questions **PowerPoint 5** **Activity 5**

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Session	Objectives/learning outcomes The learner will:	Activities and resources	Assessment criteria
		Activities Q&A; general discussion; reference to BS 7671: 2018; centre-devised sample objective questions on Part 4. **Resources** Candidate's own copy of BS 7671:2018 **PowerPoint 5** **Activity 5**	
6	**Understand the requirements for protection for safety for electrical installations (cont.)** • Protection against overcurrent (cont.)	• Understand how the coordination between conductor and overload device may be achieved. • Identify where devices for overload and fault current may be positioned and where they may be omitted. • Understand the characteristics of a fault current device in relation to the adiabatic equation. **Activities** Q&A; general discussion; reference to BS 7671: 2018 Appendices; centre-devised sample objective questions on the Appendices. **Resources** Candidate's own copy of BS 7671: 2018 **PowerPoint 5** **Lesson plan 6** **Worksheet 6**	Question and answer Discussion on results of objective questions **Worksheet 6**

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Session	Objectives/learning outcomes The learner will:	Activities and resources	Assessment criteria
7	**Understand the requirements for protection for safety for electrical installations (cont.)** • Protection against voltage disturbances and electromagnetic disturbances (Chapter 44) • Requirements for Isolation and Switching in electrical installations (Chapter 46)	• Identify and understand the differences between overvoltages of atmospheric origin and those caused by switching within an installation. • Identify categories of equipment and their minimum impulse withstand voltages. • Identify the measures to be taken to reduce electromagnetic disturbances. • Identify the various arrangements for bonding networks. • Understand the requirements for protection against undervoltage. • Understand the types of switching employed, and the regulations relating to each type. **Activities** Q&A; general discussion; reference to BS 7671: 2018 Appendices; centre-devised sample objective questions on the Appendices. **Resources** Candidate's own copy of BS 7671: 2018 **PowerPoint 7** **Worksheet 7a** **Worksheet 7b**	Question and answer Discussion on results of objective questions **Worksheet 7a** **Worksheet 7b**

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Session	Objectives/learning outcomes The learner will:	Activities and resources	Assessment criteria
8	**Understand the requirements for selection and erection of equipment for electrical installations** **Part 5** • Identify the requirements for selecting and erecting equipment, within the scope of BS 7671 • Interpret how this applies to electrical installations within the scope of BS 7671 to include: ○ common rules ○ selection and erection of wiring systems ○ protection, isolation, switching, control and monitoring ○ earthing arrangements and protective conductors ○ other equipment ○ safety services	• Understand the requirement to comply with standards. • Know the requirements for the identification of conductors. • Understand the need for diagrams and documentation. • Identify appropriate warning notices. • Be aware of the electromagnetic effects in ferromagnetic enclosures. • Understand the relationship between the choice of wiring systems and external influences. **Activities** Q&A; general discussion; reference to BS 7671: 2018; centre-devised sample objective questions on Part 5. **Resources** Candidate's own copy of BS 7671: 2018 and Centre handbook **PowerPoint 8** **Worksheet 8** **Activity 8**	Question and answer Discussion on results of objective questions. **Worksheet 8** **Activity 8**
9	**Understand the requirements for selection and erection of equipment for electrical installations (cont.)**	• Be aware of the requirements for voltage drop and the maximum values given in Appendix 4 • Understand the requirements for the selection of wiring systems to minimise the spread of fire.	Question and answer Discussion on results of objective questions **Worksheet 9**

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Session	Objectives/learning outcomes The learner will:	Activities and resources	Assessment criteria
		Activities Q&A; general discussion; reference to BS 7671: 2018 Appendices; **Worksheet 9** and centre-devised sample objective questions on Part 5. **Resources** Candidate's own copy of BS 7671: 2018 and Centre handbook Basic circuit design handout Copy of (R_1 + R_2) values **PowerPoint 9** **Lesson plan 9** **Worksheet 9**	
10	**Understand the requirements for selection and erection of equipment for electrical installations (cont.)**	• Identify the requirements regarding the proximity of wiring systems to other services. • Identify the devices used for fault protection, risk of fire, and overcurrent. • Understand the reason for, and the connection of, SPDs. **Activities** Q&A; general discussion; revision of session 9 content using **Worksheet 10a**; learners to complete **Worksheet 10b** before next session; reference to BS 7671: 2018 Appendices; centre-devised sample objective questions on Part 5.	Question and answer Discussion on results of objective questions **Worksheet 10a** **Worksheet 10b**

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Session	Objectives/learning outcomes The learner will:	Activities and resources	Assessment criteria
		Resources Candidate's own copy of BS 7671: 2018 **PowerPoint 10** **Worksheet 10a** **Worksheet 10b**	
11	**Understand the requirements for selection and erection of equipment for electrical installations (cont.)**	• Understand the requirements for devices for protection against undervoltage. • Understand the requirements for coordination of switching / control equipment. • Identify the devices used for isolation, switching off for mechanical maintenance, emergency switching, functional switching, control circuits and motor control. • Understand the requirements for firefighter's switches. • Understand the need for and requirements of the installation of monitoring devices. **Activities** Q&A; general discussion; recap of session 10 content using **Worksheet 10b**, reference to BS 7671: 2018 Appendices; centre-devised sample objective questions on Part 5. **Resources** Candidate's own copy of BS 7671: 2018 **Worksheet 10b**	Question and answer Discussion on results of objective questions **Worksheet 10b** **Worksheet 11**

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Session	Objectives/learning outcomes The learner will:	Activities and resources	Assessment criteria
		PowerPoint 11 **Worksheet 11**	
12	**Understand the requirements for selection and erection of equipment for electrical installations (cont.)**	• Understand the requirements for earthing arrangements, protective conductors and protective bonding conductors. **Activities** Q&A; general discussion; reference to BS 7671: 2018 Appendices; centre-devised sample objective questions on Part 5. **Resources** Candidate's own copy of BS 7671: 2018 **PowerPoint 12** **Worksheet 12** **Activity 12**	Question and answer Discussion on results of objective questions **Worksheet 12** **Activity 12**
13	**Understand the requirements of inspection and testing of electrical installations** **Part 6** • Identify the requirements for inspection and testing • Interpret how this applies to electrical installations	• Understand the general requirements for the initial verification of an installation. • Identify relevant areas of inspection. • Identify the tests and the sequence of testing. • State minimum values and test voltages for insulation resistance. **Activities** Q&A; general discussion; reference to BS 7671: 2018 Part 6 and Appendix 6; centre-devised sample objective questions on Part 6.	Question and answer Discussion on results of objective questions **Activity 13**

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Session	Objectives/learning outcomes The learner will:	Activities and resources	Assessment criteria
		Resources Candidate's own copy of BS 7671: 2018 **PowerPoint 13** **Lesson plan 13** **Activity 13**	
14	**Understand the requirements of inspection and testing of electrical installations (cont.)**	• Understand the reasons for and the requirements of periodic inspection and testing. • Identify the relevant documentation to be completed. **Activities** Q&A; general discussion; reference to BS 7671: 2018 Appendices; centre-devised sample objective questions on Part 6. **Resources** Candidate's own copy of BS 7671: 2018 **Activity 14**	Question and answer Discussion on results of objective questions **Activity 14**
15	**Understand the requirements of special installations and locations as identified in BS 7671** **Part 7** • Identify the requirements for special installations and locations • Interpret how these effect the general requirements of the regulations	• Understand why some installations and locations are regarded as special. • Understand the reasons that some locations require special consideration. • Understand the general requirements of each of the 20 special locations.	Question and answer Discussion on results of objective questions **Worksheet 15**

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Session	Objectives/learning outcomes The learner will:	Activities and resources	Assessment criteria
		Activities Q&A; general discussion; reference to BS 7671: 2018 Part 7; centre-devised sample objective questions on Part 7. **Resources** Candidate's own copy of BS 7671: 2018 **Lesson plan 15** **Worksheet 15**	
16	**Understand the requirements for selection and erection of equipment for electrical installations** **Appendices** • Identify the information in the appendices of BS 7671 • Specify how the information contained in the appendices is used to support electrical installation activities	• Use the appendices to determine additional technical data and information for use with relevant parts of BS 7671: 2018. **Activities** Q&A; general discussion; reference to BS 7671: 2018 Appendices; centre-devised sample objective questions on the Appendices, or use of City & Guilds Exam Success book. **Resources** Candidate's own copy of BS 7671: 2018 **PowerPoint 16** **Worksheet 16**	Question and answer Discussion on results of objective questions **Worksheet 16**

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Session	Objectives/learning outcomes The learner will:	Activities and resources	Assessment criteria
17	Revision and final assessment practise	**Activities** Complete sample paper; Q&A; general discussion; reference to BS 7671: 2018 Appendices; centre-devised sample objective questions. **Resources** Candidate's own copy of BS 7671: 2018 Sample paper	Question and answer Discussion on results of objective questions Sample paper

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